CHAPTER III

DESIGN OF THE STUDY
The present study is a comparison of non-sports girls and sports girls on a number of variables. As per the objectives of the study, the investigator had to plan the entire process of research work in terms of research design suited to the present study. The design is systematically presented under four heads:

1. Sample
2. Tools and Techniques used
3. Collection of data
4. Statistical procedure

1. **SAMPLE**

Two samples consisting of 300 sports girls and 300 non-sports girls in the 14-16 age group were taken. There were 600 subjects in both samples. Sports girls were selected on the basis of the stratified random sampling technique whereas a random sampling device was used to collect data for non-sports girls from the high school in Sirmour, Solan and Shimla Districts of Himachal Pradesh. These schools are located in the urban and rural areas of Himachal Pradesh. From each district five schools from the urban and five from the rural areas were selected.
at random to have a representative sample. From each of these schools 20 subjects (10 sports girls and 10 non-sports girls) were selected from 9th and 10th classes so as to ensure 600 subjects for this study. The sports sample of this study included four games: volleyball, badminton, hockey and basketball. The major part of the state of Himachal Pradesh comprises high altitude areas which remain under snow the year around, the sample was restricted to those districts only where sports activity is regularly conducted.

I (i) **Sports girls:**

Sports girls were those who had at least participated at the zonal level sports competition. The sample of sports girls was confined to some team games only in view of the considerations that team games are more relevant in terms of the impact of socio-psychological make-up of the players as these games provide situations of interaction among players and the team works as a system rather than an individual as compared to that of individual events. Further only four team games viz. Basketball, Volleyball, Hockey and Badminton were selected as these games are widely played not only in this State but throughout the country at all levels. The investigator's active participation in these games was also an additional factor for their inclusion in this study.
Non-sports girls were those who had never participated in any structured and competitive sports at any level. They were selected from the same districts and schools to which the sports girls belonged. In order to ensure equitability of the groups, non-sports girls were taken from the same class, age group and school to which the sports girls belonged. The number of non-sports girls chosen from the school was also equal to the number of sports girls from that very school.

The total number of subjects for the present study was 600 - 300 sports girls and 300 non-sports girls. The district-wise break-up is given below in Table 1.

Table 1

District-wise Break-up of the Sports girls and Non-sports girls sample

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Districts</th>
<th>Shimla</th>
<th>Solan</th>
<th>Sirmour</th>
<th>Total No. of subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sports Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Basketball</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>b) Volleyball</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>c) Badminton</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>d) Hockey</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>2. Non-sports</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>
I-(iii) Selection of the Variables:

Keeping in view the educational importance and performance in sports, following variables were selected for this study:-

1. Self Concept Variables
   i) Physical Self-concept
   ii) Social Self-concept
   iii) Temperamental self-concept
   iv) Educational Self-concept
   v) Moral Self-concept
   vi) Intellectual Self-concept

2. Adjustment variables
   i) Emotional adjustment
   ii) Social adjustment
   iii) Educational adjustment

3. Creative Thinking Variables
   i) Fluency
   ii) Flexibility
   iii) Originality
   iv) Elaboration
2. **TOOLS AND TECHNIQUES USED**

The selection of tools was governed by considerations of their (i) availability (ii) suitability to the sample (iii) reliability and validity. Keeping in view these considerations, following tests were used for data collection.

(a) To measure physical, social, temperamental, educational, moral and intellectual aspects of self concept, a scale constructed by Saraswat (1984) was used.

(b) To measure the emotional, social and educational adjustment, an inventory for school students (AISS) by Sinha and Singh (1984) was used.

(c) To measure fluency, flexibility, originality and elaboration in creativity, creative thinking test constructed by Baqer Mehdi (1973) was utilized.

3. **COLLECTION OF DATA**

**Administration of Tests:**

After selecting the sample of the study and before conducting the tests, the purpose of testing and the technique to be employed in the study of the subjects, and all possible doubts were clarified. They were assured that the information obtained through the scale would be kept confidential. It would be used for research purpose only, and would not harm them in any case. Therefore, they were urged to feel free and
reply every question frankly and sincerely. The subjects showed enthusiasm and promised to give whole hearted cooperation to the research scholar for this venture. In this study questionnaire methods were used. All the three questionnaire scales were administered to all subjects under the direct supervision of the investigator. The questionnaires were administered in accordance with the instructions laid down in the manual. While administering questionnaires, subjects were assembled in their respective school's hall at 11 a.m. on each day of testing. These tests were administered one after the other separately, after a gap of one day in between the two tests. In administering the tests, the instructions and directions given by the authors in the test manuals were strictly followed. The investigator took help of the physical education teacher of the respective schools to conduct the tests. The details of the various scales and tests used are described below:

(a) The Scale to measure self-concept of school students, constructed and standardized by Saraswat (1984) (see appendices A)

The self-concept inventory provides six separate dimensions of self-concept, viz. physical, social, intellectual, moral, educational and temperamental self concept. It also gives a total self-concept score. The operational definitions of the self-concept measured are:

(i) Physical: Individual’s view of their body health, physical appearance and strength.
(ii) **Social**: Individual's sense of worth in social interactions.

(iii) **Temperamental**: Individual's view of his prevailing emotional state or predominance of a particular kind of emotional reaction.

(iv) **Educational**: Individual's view of himself in relation to the school, teachers and extracurricular activities.

(v) **Moral**: Individual's estimation of his moral worth; right and wrong activities.

(vi) **Intellectual**: Individual's awareness of his intelligence and capacity of problem solving and adjustments.

The inventory used in this study contained 48 items. Each dimension contained eight items. Each item was provided with five alternatives. Responses were obtained on the test booklet itself. 20 minutes were given for responding to all items. At the outset of conducting the test, instructions were read out by the investigator to the subjects. The scoring was done by using the key of the test.

(b) **Adjustment Inventory for School Students (AISS)** - Sinha and Singh (1984) (see appendices B)

This inventory is for Hindi-knowing school students of India. It seeks to segregate well-adjusted secondary school students (age group 14 to 18 years) from poorly adjusted students in three areas of adjustment: Emotional, Social and Educational.
The students can be classified into five categories in accordance with the raw scores obtained by them on the inventory. The five different categories of adjustment are: 'A' stands for excellent, 'B' for good, 'C' for average, 'D' for unsatisfactory and 'E' for very unsatisfactory adjustment.

Table 2
Classification of Adjustment terms of Categories

<table>
<thead>
<tr>
<th>Categories</th>
<th>Description</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>5 and below</td>
<td>5 and below</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>6-12</td>
<td>6-14</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>12-13</td>
<td>15-22</td>
</tr>
<tr>
<td>D</td>
<td>Unsatisfactory</td>
<td>22-30</td>
<td>23-31</td>
</tr>
<tr>
<td>E</td>
<td>Very unsatisfactory</td>
<td>31 and above</td>
<td>32 and above.</td>
</tr>
</tbody>
</table>

The adjustment inventory questionnaires were supplied to the subjects. They were given the instructions laid down in the test manual to fill in the response sheets. After 10 minutes response, sheets were taken back.

Scoring: The inventory used in this test contained 60 items. Each dimension contained 20 items. Each item was provided with two alternatives. 'Yes' indicated lack of adjustment and 'No' indicated well adjustment. One number was provided for 'Yes' and 'no' was provided with zero. Low score indicated good adjustment and high score indicated poor adjustment.
1. **Verbal Test:** This battery consists of two parts:

   The verbal test of creativity includes four sub-tests, namely consequences test, unusual uses test, similarity test and product improvement test.

   The total time required for administering the test is 48 minutes in addition to the time necessary for giving instructions, passing test booklets to children and collecting them back.

   (i) **Consequence test:**

   The consequences test consisted of three hypothetical situations (a) What would happen if man could fly like a bird? (b) Our schools had wheels? and (c) What would happen if man did not have any need for food?

   The subject was required to think as many consequences of these instructions as he could and write them under each situation, in the space provided. The situations being hypothetical, minimized the effect of experience and also provided the subject with an unlimited opportunity to make responses. The test encouraged play of imagination and originality. The time allotted for three problems to four minutes each.

   (ii) **Unusual Uses test:**

   This test presented the subject with the names of three common objects - a piece of stone, a wooden stick and water
and required him to write as many novel, interesting and unusual uses of these objects as he/she might think of, the time allowed for the three tests was 5 minutes each.

(iii) **New relationship test:**

This test presented the subject with three pairs of words apparently different tree and houses, chair and ladder, air and water, and required her to think and write as many novel relationships as possible between the two objects of each pair in the space provided. The test provided an opportunity for the free play of imagination and originality. The time allowed for each pair of words was 5 minutes.

(iv) **Product Improvement test:**

In this test the subject was asked to think of a simple wooden toy of a horse and suggest addition of new things to it to make it more interesting for the children to play. The time allowed was 6 minutes.

2. **Non-verbal**

The non-verbal test was part of the total battery which consisted of both verbal and non-verbal tests. The non-verbal test of creative thinking was intended to measure the individual's ability to deal with figural content in a creative manner. Three types of activity were used for this purpose, viz., picture construction, picture completion, and triangles and ellipses. The total time required for administering the test was 35 minutes in addition to the time necessary for
giving instructions, passing on booklets and collecting them back.

(i) Picture Construction Activity

This activity presented the subject with two sample geometrical figures, a semi-circle and a rhomb and requires him to construct an elaborate picture using each figure as an integral part. The subject was allowed to turn the page to use the figure in any way he liked for making the picture. Emphasis was put on originality and elaboration. Originality was emphasized by the instruction that the subject should try to make as novel a picture as possible and such that no one else would be able to produce. Elaboration was emphasized by the instruction that the subject might add as many details as he thought necessary in order to make the picture tell as complete and as interesting a story as possible. Ten minutes were allowed for the two tasks. The pictures were scored for elaboration and originality. The subject was also asked to give an interesting and unusual title to each picture. The title was also scored for verbal elaboration and originality and the scores added to the verbal creativity score obtained in the verbal creativity test. The titles were also scored.

(ii) Incomplete Figure Activity:

This activity consisted of 10 line drawings which could be made into meaningful pictures of different objects. The subject was asked to make a picture which no one else in the group will be able to think of. He was also asked
to give an interesting and suitable title to each picture he made. The subject was given 15 minutes for 10 items. Each item was scored for elaboration and originality. The title was also scored for verbal elaboration and originality and the scores added to the verbal creativity score obtained on the verbal creativity test.

(iii) **Triangles or Ellipses Activity:**

In this activity the subject was provided with 7 triangles and 7 ellipses and he was required to construct different meaningful pictures based on the two given stimuli. The subject was here encouraged "to make multiple associations to single stimuli", the responses could be scored for flexibility also, besides elaboration and originality. But as this was the only activity in which flexibility scoring was possible, it was recommended that here too the test user should confine himself to elaboration and originality scoring alone. A total time of 10 minutes was allowed for this activity. The subject was also asked to give an interesting and suitable title to each picture which was to be scored for verbal elaboration and originality and the scores added to the verbal creativity score obtained on the verbal creativity test.

The three activities taken together provided ample opportunity to the subject to use his imagination with different types of figural tasks and come out with some novel idea.
SCORING

(a) Scoring For Fluency:

The investigator read the responses to the item in question carefully and struck off those responses which were found irrelevant or repetitive, appropriate response was judged as relevant. When such response was considered relative to the test problem, the remaining number of responses were counted and this number entered as fluency score for the item in the appropriate box in the answer-sheet.

(b) Scoring For Flexibility:

Flexibility of testees was judged on the basis of the ability to produce ideas which differed in approach or thought trend. All ideas which fell under one category of approach or thought trend were treated as for purposes of flexibility scoring. Thus if five ideas were produced and all belonged to only one category or approach or thought trend, then the score for flexibility was given as 1. If all the five ideas were based on five different approaches or thought trends, then the flexibility score was given as 5. Category alphabet was marked against each response. The flexibility score was arrived at by counting the total number of different alphabet used.

(c) Scoring For Originality

This was done on the basis of statistical, uncommonness of responses. The more uncommon the response the higher was
the originality weight awarded. The weights for originality scoring have been determined on the basis of the following scheme:

If a response was given by .1% to .99% of the testees, then the responses got an originality weight of 5; if a response was given by 1 per cent to 1.99 per cent of the testees, then the response would get an originality score of 4; if a response was given by 2 per cent to 2.99 per cent of the testees, then the response would get an originality score of 3, if a response was given by 3 per cent to 3.99 per cent of the testees, then the response would get an originality weight of 2; if the response was given by 4 per cent to 4.99 per cent of the testees, then the response would get an originality weight of 1. Responses given by 5 per cent or more of the testees would get an originality weight of zero.

The scoring was done for elaboration and originality in the non-verbal test as follows:

(d) Elaboration

The investigator kept in mind that titles too had to be scored for elaboration and originality. These scores were considered as verbal rather than non-verbal and were scored separately. In scoring for elaboration, care was taken to identify the primary and minimum response and all additions were taken as elaborations over it. For example, if a picture was of an aeroplane and the title read "Pilot
returning after bombarding the enemy", the elaboration score for this title would be the number of ideas included in the title - one for pilot, one for returning, one for bombarding and one for enemy (total score = 4). As the word aeroplane is not verbally mentioned, so no scoring for aeroplane would be given.

(e) **Originality**

The scoring for originality was done similarly to that of the scheme followed in the scoring of originality in the verbal test of creative thinking.

The scores of elaboration and originality scores for each achievement were then added up separately to obtain elaboration and originality scores.

**Reliability levels of the scales used in this study:**

Mehdi's reliability levels of the scales are as follows:

1. **Verbal test:** The test re-test reliabilities of the factor scores and the total score were obtained on a small sample (N=31). Reliabilities for both the factor score and the total creativity score ranged from .896 to .959. The reliability of total creativity score which came out to be .959 is again quite high. Inter-scorer reliabilities for the factor scores in one study were found to range from .653 to .981.

2. **Non-verbal test:** The test-retest reliabilities of the factor scores and also the total score were obtained on a
small sample of 50 pupils. The reliabilities of factor scores and also the total creativity score are considerably high ranging from .932 to .947. The inter-score reliabilities using 34 test-scripts were found to be .981, .980, and .917 for elaboration, originality and total creativity scores, respectively.

4. **STATISTICAL PROCEDURE**:

Simple techniques like mean and SD were used to find out the nature of differences in the variables as manifested in the responses of different groups of students.

To find out the major effects of sports participation and non-participation on self-concept, adjustment and creativity, the Analysis of Variance (2x2 factorial design) was used.

The significance of differences in the mean scores of self-concept, adjustment and creative thinking variables were determined between the two groups in the total sample by employing the t-test of significance.