CHAPTER V

METHOD
Design

The present study, mainly a correlational study, aimed at investigating the relationship between achievement and anxiety, intelligence, social class, and vocational aspirations. As such, each subject was to be tested on various tests measuring achievement, anxiety, intelligence, and vocational aspirations. Besides product-moment correlations, partial correlations and multiple correlations were worked out. Regression analysis was also done in order to see relative contribution of different variables in explaining achievement scores on the subjects. In addition two-way analysis of variance was done by investigating one index while controlling for the other three. Since sex was one of the variables, all the tests were administered to both boys and girls and the statistical calculations were done on both the groups separately as well as jointly.

Subjects

The sample for the present study consisted of 429 ninth class students, 229 girls and 200 boys. These students were taken from Government higher secondary schools for boys and girls of Chandigarh, Amritsar, and Jullundur. It was thought that the subjects taken from the schools of these three cities, when combined, would give a representative sample of Punjab. Students from three schools of Chandigarh, two of Jullundur, and two of Amritsar formed part of the sample in the present study. The
number of students taken from different schools of each city is given in Table 7. All the students in different sections of ninth class were taken. Sometimes, when there were many sections and the total number of students for all sections exceeded the number required, selection of students was done randomly.

**TABLE 7**

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of schools</th>
<th>No. of subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt. Higher Secondary School for Boys, Sector 19, Chandigarh.</td>
<td>49 -</td>
</tr>
<tr>
<td>2.</td>
<td>Govt. Higher Secondary School for Boys, Sector 23, Chandigarh.</td>
<td>40 -</td>
</tr>
<tr>
<td>4.</td>
<td>Govt. Higher Secondary School for Boys, Amritsar.</td>
<td>58 -</td>
</tr>
<tr>
<td>5.</td>
<td>Govt. Higher Secondary School for Girls, Amritsar.</td>
<td>- 87</td>
</tr>
<tr>
<td>6.</td>
<td>Govt. Higher Secondary School for Boys, Jullundur.</td>
<td>53 -</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL:</strong></td>
<td><strong>200 229</strong></td>
</tr>
</tbody>
</table>

**Material**

The material consisted mostly of various tests apart from a precision stop watch. The tests used were - one of

achievement, one of Test Anxiety, one of Intelligence, one of
Socio-economic Status, and one of Vocational aspirations.

Thematic Apperception Test of Achievement

The adapted version of the TAT (McClelland, et al., 1953), as described in chapter IV, was used. In the TAT, a sample of the subjects' fantasies is collected by making them write brief stories suggested by the pictures projected on the screen for 20 seconds. The tone of standard instructions for this test is to make the subjects as creative as possible and not to think in terms of right or wrong answers. The stories in which concern with competition in terms of direct competition with a standard of excellence, unique accomplishment or long-term involvement is shown, are considered to be having achievement imagery and are further scored for subcategories. The subcategories represent different aspects of the problem solving behaviour such as need of the individual, instrumental achievement acts, anticipation of the attainment of goal and several others. The scoring scheme includes points for the achievement imagery and additional points for the subcategories.

Test Anxiety Scale for Children

An adapted version of Test Anxiety Scale for Children (TASC) developed by Sarason, et al. (1960) was used to measure Test Anxiety in the subjects. This scale consists of 30 statements. The statements are read to the subjects who are required to circle either 'Yes' or 'No' on an answer sheet. The questions are phrased so that a 'Yes' response always indicates anxiety. The Hindi adaptation as used in the present study had been done
in connection with a project (Nijhawan, 1968) sponsored by the University Grants Commission, New Delhi. The reliability and validity of the adapted version was quite satisfactory. The reliability figures ranged from .88 to .90 and validity, as worked out from item analysis and by correlating anxiety scores to teachers' rating, was also encouraging. The correlations between anxiety scores and teachers' ratings were .28, .37, and .32 for the boys (N=100), girls (N=100) and for the combined groups (N=200) respectively. All these values are significant beyond the .01 level. Besides the 30 items of TASC, eight lie items five from Sarason, et al. (1960) General Anxiety Scale for Children (GASC) as translated in Hindi and three more were included in it. The criteria used for construction of the lie items were the same as used by Sarason, et al., which was that the items should refer to things that every one experiences. These items were distributed over 30 items of the TASC in the same manner in which lie items are distributed in Sarason, et al., GASC. The score on these items indicated whether the subject was or was not lying in his responses. The subject who gave four or more negative responses on lie items was excluded from the sample.

Standard Progressive Matrices

The Standard Progressive Matrices - henceforth called SPM - (Raven, 1960) was used as a measure of intelligence. The SPM is a test of "... a person's capacity at the time of the test to apprehend meaningless figures presented for his observation, see the relations between them, conceive the nature of the
figure completing each system of relations presented, and, by so doing, develop a systematic method of reasoning" (Raven, 1960).

The SPM consists of 60 problems, divided in five sets - A, B, C, D, and E - with 12 problems in each set. The first problem in each set is intended to be self-evident and is followed by problems of increasing difficulty. Each figure is boldly presented in geometric design. A number of alternatives - six or eight are given below each of these designs; all of these fit the missing part but one logically belongs to it. The subject by studying explicitly or implicitly the relation between the various parts of the design has to decide which is the right alternative. Nelson and Edelstein (1963) reported, that SPM could be successfully used in "...testing intelligence of children with language/cultural handicap." Since it is a culture-free test it could be used with confidence on an Indian sample.

Socio-economic Status Scale

Kuppuswamy's (1962) Socio-economic Status Scale was used to find out the social class of the subjects. The information can be collected by using Form A or Form B. Form A is meant for adults who are either earning or who are out of employment. Form B is meant only for students. In the present study as information was to be sought from students about their fathers'/guardians' education, occupation, and income, Hindi version of Form B was used.

Vocational Information Questionnaire

The realistic and unrealistic nature of vocational
aspirations in the present study is considered in the context of the theory of achievement motivation. The criterion used to determine the realism and unrealism of vocational aspirations was the subjective goal discrepancy of the subjects — one of the criteria used by Mahone (1960). According to this criterion, the measure of the degree of realism of a subject's vocational aspiration was the discrepancy between the subject's estimate of his own general ability and the amount of general ability the subject himself felt was required to succeed in the vocation he aspired for. As is evident, to find out subjective goal discrepancy, information was needed on three points — (i) the stated vocational aspiration, (ii) subjective estimate of subject's own ability, (iii) the estimate of the level of general ability required for the vocation the subject aspires for.

To know the vocational aspirations of the subjects, a list of occupations was used. The list was prepared on the basis of information available from two studies one by Chaudhry and Arora (1965) and the other by Tyler and Sundberg (1964). In the former study, vocational choices of ninth class boys and girls from two higher secondary schools, one for boys and one for girls of Delhi were obtained. These subjects were asked to give their occupational choices by stating the names of occupations they would like to take up on completing their education. In the latter study the subjects had not to state their vocational choices but to mention the names of occupations with which they were familiar. It was assumed, while mentioning the names of
occupations with which they were acquainted, they would have definitely included the occupations they would like to take up as a career. The variety of occupations mentioned by the subjects of the above mentioned two studies proved useful for preparing an exhaustive list of occupations. Besides this, an Occupational Inventory containing names of different occupations was also consulted for preparing the list.

To measure the subjects' estimate of the level of general ability necessary to attain their occupational goals, Mahone (1960) asked the subjects to state the percentage of the undergraduates at the University of Michigan, who possessed sufficient general ability to attain the occupations given in the list. However, since the subjects of this study were of younger age, the procedure was modified a little. Subjects in the present study were asked to keep in mind the students of their own class and state how many students were suitable for each of the occupations given in the list. It was assumed that the subjects could more easily think of the students in their own class rather than students of ninth class in general. Responses of the subjects were converted into percentages.

As a measure of their perception of their own ability, the subjects' estimate of their general ability in relation to the general ability of their class fellows was obtained. The method used to get this information was that subjects were asked if a test of general ability of 100 marks was given to their class, how many marks they expected to get in this test in
relation to the marks they expected their class fellows will get. This information was later used to work out the percentile ranks of the subjects.

Three questions formulated to elicit the information required for finding out the subjective goal discrepancy were:

(1) Which of the following occupations would you choose or is closest to your choice?

(2) How many children from your class have sufficient ability to attain the following occupations?

(3) Suppose your class was given a general ability test of 100 marks, how many marks do you think you will get?

Procedure

Measurement of n Achievement

The n Achievement test was administered under neutral conditions which implies that before the administration of the test, nothing was intentionally done to increase or to decrease the achievement motive in the subjects. Six pictures in order of their presentation to the subjects were: B.4 – A doctor and a patient; D.4 – A boy learning ‘tabla’ from his teacher; A.5 – A boy with a book sitting on the cot; A.4 – A boy with a notebook, an inkpot and a pen; B.2 – A boy painting; C.2 – A group of boys playing cricket.

This test was administered to a group of students at a time. Subjects in groups of ten to fifteen were called to
the room where they were to be tested and where seats were arranged at some distance from one another. The subjects were asked to take their seats and feel at ease. After they had occupied their seats, the investigator introduced herself to the subjects. The purpose of the testing was explained to them. After this, answer booklets were distributed to the subjects. Each booklet consisted of six $8\frac{1}{2}'' \times 10\frac{1}{2}''$ sheets with one cover page for preliminary information and instructions. These seven sheets were stapled together. On each of the six sheets 4 sets of questions in Hindi were printed. The sets of questions were equally spaced so that equal space was permitted for writing answers to each of the questions. The questions as given in McClelland, et al. (1953, p. 98) and used as verbatim in the adapted version were:

1. What is happening? Who are the persons?
2. What had led up to this situation? That is, what has happened in the past?
3. What is being thought? What is wanted? By whom?
4. What will happen? What will be done?

On distribution of the booklets, each subject was asked to write his/her name, class, father's name, section etc. in the space provided at the top of the cover page. Subjects were asked to go through the instructions (same as given in McClelland, et al., 1953, p. 98) written in Hindi at the cover page of their answer booklets. The experimenter also read out these instructions to them. The instructions were:

This is a test of your creative imagination. A number
of pictures will be shown to you. You will have twenty seconds to look at the picture and then about four minutes to make up a story about it. Notice that there is one page for each picture. The same four questions are asked. They will guide your thinking and enable you to cover all the elements of a plot in the time allotted. Plan to spend about a minute on each question. I will keep time and tell you when it is about time to go on to the next question for each story. You will have a little time to finish your story before the next picture is shown.

Obviously there are no right or wrong answers, so you may feel free to make up any kind of a story about the pictures that you choose. Try to make them vivid and dramatic, for this is a test of creative imagination. Do not merely describe the picture you see. Tell a story about it. Work as fast as you can in order to finish in time. Make them interesting. Are there any questions? If you need more space for any question, use the reverse side.

After the instructions had been read out and the experimenter felt sure that the subjects knew what they had to do, the first of the six pictures was kept with face down in front of each subject. Six pictures had already been arranged in the sequence in which they were to be presented to the subjects. When each of the subject had got the first picture, the subjects were asked to turn the picture and look at it for 20 seconds. After 20 seconds they were asked to keep that picture face down and start writing. The time was noted as soon as they started writing. After every one minute, they were
asked to go to the next question. While the subjects were busy writing, the first picture was collected from the desks of the subjects and the second picture was placed face down in front of each of the subject. When four minutes were over, they were asked to turn to the second page and to also turn up the picture put on their desks. They were asked to observe it for 20 seconds and again keep it in the face down position. At the end of 20 seconds they were asked to start writing. After every one minute they were asked to proceed to the next question. When 4 minutes were over, they were asked to turn the page as well as the picture which had already been put in front of them in the face down position. This procedure of showing picture for 20 seconds, asking the subjects at the end of every one minute to proceed to the next question and then asking them at the end of four minutes to start writing a new story in response to the new picture, continued till the stories for six pictures had been written. One session of test administration continued for 40-50 minutes. The programme of testing continued for about 3 months to cover the whole sample of 429 subjects from the already mentioned three cities of Punjab.

The final data contained 429 x 6 i.e., 2574 n Achievement protocols. Before scoring these n Achievement protocols of the subjects, a considerable amount of time was spent on scoring practice materials prepared by Smith & Feld (1958). The procedures and instructions given by Smith and Feld for scoring the practice materials were strictly followed.
Before working with the practice materials, the scoring manual for the Achievement Motive given in McClelland, et al. (1953) and Atkinson (1953) was studied thoroughly. The manual gives the definition of Achievement Imagery. The presence of Achievement Imagery in the story indicates that the story is achievement related and is to be further scored for subcategories related to achievement-oriented behavior. The manual lays down different criteria for scoring Achievement Imagery. The definitions of different subcategories and characteristics of behavior which indicate their presence are clearly stated therein with examples. When the investigator felt confident that she had followed the definition of Achievement Imagery and other scoring categories prescribed in the above mentioned manual, she started scoring the stories given in practice sets A through G. For sets B through G agreement with the expert was computed.

The two indices of agreement between the investigator and the expert for practice stories sets B through G are given in Table 8. First is the percentage agreement on the presence of motive-related Imagery and second rank-order correlation on total score for each story.

**Table 8**

<table>
<thead>
<tr>
<th>Reliability Index</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>% (percent imagery agreement)</td>
<td>100</td>
<td>.90</td>
<td>.97</td>
<td>.85</td>
<td>100</td>
<td>.96</td>
</tr>
<tr>
<td>Rho (rank-order correlation)</td>
<td>.95</td>
<td>.88</td>
<td>.93</td>
<td>.83</td>
<td>.88</td>
<td>.96</td>
</tr>
</tbody>
</table>

1 Results from Set A are not included because it was not scored in the manner as sets B-G.
Investigator's scoring reliability was checked on 60 stories (30 of boys and 30 of girls). These were scored by two scorers who had acquired the requisite level of skill through work with practice materials prepared by Smith and Feld (1958). Their interscorer reliability correlation was .85 (rho). The rank-order correlations between the scoring of the investigator and the two scorers were .97 and .81.

Measurement of Anxiety

Before the TASC was administered to the subjects, the investigator was taken to different classes and was introduced to the class, as a whole, by the respective class teachers. After being introduced the investigator left the class room. The subjects in groups of six were called to the testing room. This size of a group was preferred because the nature of this test is such that reliable results can only be expected when there is proper communication between the examiner and the examinee. It was felt that in a group of six better communication between the subjects and the investigator would be possible. When all the subjects had taken their seats already arranged at some distance from one another and felt comfortable, one answer sheet and a pencil were given to each subject. The subjects were asked to give preliminary information in the space provided for it at the top of the answer sheets. This information consisted of student's name, father's name, class, section, age etc. Subsequent to this, instructions printed in Hindi on the Scale (given in appendix 3) were read out to the subjects. The instructions were the same.

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1 The investigator wishes to thank H.M. Kanade and H.K. Nijhawan for their assistance in the reliability check.
as originally formulated by Sarason, et al. (1960) for Test Anxiety Scale for Children and read as follows:

"... I am going to ask you some questions. No one but myself will see your answers to these questions, not your teacher or your principal or your parents. These questions are different from other questions that you are asked in school. These questions are different because there are no right or wrong answers. You are to listen to each question and then put a circle around either "yes" or "no." These questions are about how you think and feel, therefore, they have no right or wrong answers. People think and feel differently. The person sitting next to you might put a circle around "yes" and you may put a circle around "no." For example, if I asked you this question: "Do you like to play ball?" some of you would put a circle around "yes" and some of you would put it around "no." Your answer depends on how you think and feel. These questions are about how you think and feel about school, and about a lot of other things. Remember, listen carefully to each question and answer it "yes" or "no" by deciding how you think and feel. If you don't understand a question, ask me about it.

Now let's start by everybody putting their finger on Number 1. Here is the first question. Number 1. "Do you worry when the teacher says that she is going to ask you questions to find out how much you know?"

After being assured by the subjects that they had given the preliminary information in the space provided for it and had
also followed the instructions, the questions were read to them. These were read one by one laying proper emphasis wherever required. The questions were read very slowly and distinctly so that each subject could understand fully what these questions implied. To elicit correct responses from the subjects every effort was made to see that they understood the questions they were asked.

One score was assigned for each "yes" answer and maximum possible score was 30. High score on Test Anxiety reflects anxiety in a variety of test like situations and low score indicates that the child is not characteristically anxious in test and test-like situations (Sarason, et al., 1960).

Measurement of Intelligence

Standard Progressive Matrices was administered in groups of ten to fifteen. The subjects were called to the testing room and were asked to take their seats. The seats were arranged sufficiently apart from one another so that copying could be prevented. When all the subjects had taken their seats, record forms and pencils were distributed to them. They were asked to fill in particulars about themselves in the space provided for it at the top of the record forms. When all of them had finished writing particulars about themselves, test books were given to them. The instructions for doing the Standard Progressive Matrices were given verbally by the investigator, but in a uniform manner as prescribed by Raven (1960). The investigator opened the test book at the first design A-1 and told the
subjects that it was a pattern with a bit missing. Each of
the six bits given below had the right shape to fit the space,
but they did not all complete the pattern. Explanation was then
given as to why the bits, 1, 2, 3 etc. were wrong. The bit No. 6
had the right shape but it did not go all over. The subjects
were then asked to point out the correct bit. If they failed to
locate the correct bit, the task was explained further till the
nature of the task to be solved was grasped. The subjects were
further told, "On every page in your book there is a pattern
with a bit missing. You have to decide each time which of the
bits below is the right one to complete the pattern above. When
you have found the right bit you write the number of it down on
your scoring form against the number of the pattern. They are
simple at the beginning and get harder as you go on. There is no
catch. If you pay attention to the way the easy ones go you
will find the later ones less difficult. Try each in turn, from
the beginning right to the end of the book. Work at your own
pace. Do not miss any out. Do not turn back. See how many
you can get right. You can have as much time as you like. Turn
over and do the next one." The performance on the first four-
five items was observed to see whether the subjects had followed
the instructions. On completion of the test when the subject
handed over his/her record form to the investigator, she checked
whether he/she had attempted all the problems. She also looked
ensured that it was filled in properly. Scoring was done with
the help of scoring key (Raven, 1960).
Measurement of Social Class

Subjects were called in groups of ten to fifteen to the testing room. When they had taken their seats, Forms B (see appendix 4) were distributed to them. The subjects were asked to write their names, class, father's name, section etc. in the respective columns given at the top of the Forms. When all the subjects had finished giving this preliminary information, they were asked to go through the instructions, printed on the Form itself. The instructions were printed in Hindi, same as was the language of the Form. The text of the instructions read as follows:

Please answer the following questions carefully regarding your father. If your father is not alive then give the particulars regarding your guardian.

Scoring procedure given in Manual (Kuppuswamy, 1962) was followed for scoring the responses of subjects on Form B. The appropriate weightage score given against the items for each of the variables of fathers' education, occupation, and income in manual were marked. Addition of these three scores gave the final score which determined the status category.

Measurement of Vocational Aspirations

To administer Vocational Information Questionnaire, subjects in groups of ten to fifteen were called to the testing room. When they had taken their seats, already arranged, Vocational Information Questionnaires (given in appendix 5) were distributed
to the subjects. It consisted of three questions and a list of occupations. The questionnaire was in Hindi. On distribution of the questionnaires, subjects were asked to write their names, fathers' names, class etc. in the respective columns provided at the top of the questionnaire. When all of them had finished writing about themselves, they were asked to read the questions carefully. In case they could not understand anything about the questions, they could consult the investigator. When all the subjects reported that they had followed the questions, they were asked to start answering them. It took them about 25-30 minutes to answer all the questions. When the answer sheets were handed over to the tester, it was ascertained that all the subjects had answered all the questions.

For application of the formula of subjective goal discrepancy, the responses of the subjects to question No.2 were converted into percentages and the responses to question No.3 were used for finding out percentile ranks of the subjects. The percentages were found out as follows: If there were fifty students in the subject's class and three were mentioned by the subject as suitable for a particular occupation, the percentage of students with sufficient ability to achieve that occupation was six.

The percentile rank of the subject was computed from his individual score following Garrett (1958, pp.67-68) — calculation of percentile ranks in a frequency distribution. The subject's score was his marks which he stated he would get
in a test of general ability of 100 marks.

The formula used to find the discrepancy score is the perceived percentage of students with higher ability than S minus the perceived percentage of students with sufficient ability to attain S's vocational goal (Mahone, 1960). The minus score indicated underaspiration and the plus score indicated overaspiration.

Raw scores on achievement, anxiety, intelligence, and social class for boys and girls are given in Appendices 6a and 6b respectively. Percentile ranks, perceived percentage of students with sufficient ability to attain S's vocational goal, subjective goal discrepancy scores, and vocational aspirations for boys and girls are given in Appendices 7a and 7b respectively.