Design of the study

2.1 The present study is entitled as "An investigation into the relationship between self concept, academic achievement, intelligence and some personality factors at junior college level".

The aspect of the environment which is experimentally studied is called the independent variable, the resulting change in behaviour is called the dependent variable. There are large number of independent variables available in nature, for the psychologist to examine. But the investigator is interested in discovering those relatively a few that affect a given kind of behaviour.

In short, we may say that an independent variable is any variable that is investigated for the purpose of determining whether it influences the behaviour under consideration. In the present investigation independent variables are

1) Self concept (total score)

The aspects of self concept involved in this study are noted below.

1) Perceived Self. (P.S.)
2) Social Self. (S.S.)
3) Ideal Self. (I.S.)

and consequently the discrepancies between these three aspects viz.

4) Perceived Self - Social Self. (P.S. - S.S.)
5) Ideal Self - Social Self. (I.S.-S.S.)
6) Ideal Self - Perceived Self. (I.S.-P.S.)

The other independent variables in this study are

2) Anxiety,
3) Achievement motivation,
4) Intelligence and
5) Goal discrepancy.

The dependent variable is academic achievement at the second year of Junior college.

2.2 SAMPLE

The nature of the research project determines the composition of the sample. Here, the investigator's purpose is to study the relationship between self concept and academic achievement at the junior college level. The problem shall be delimited to the students of the various junior colleges in Kolhapur, Sangli and Warnanagar. It consists of students within the age range of 15 to 21 years i.e. an adolescent age group. Psychologically speaking, this developmental period is important for personal and social adjustment of individual. The investigator is also interested in achievement scores based on some standard examination. XII standard examination is considered and it fulfills the investigator's need.

The population from which the sample is drawn is urban as well as rural. A list of all the junior colleges
in Kolhapur is prepared. In order to cover all the socio-economic sections of society, and the different levels of academic achievement, certain colleges are selected randomly, with the help and judgment of some teachers. One rural college (i.e. Warnanagar college) is selected in order to balance the urban and rural population. Students belonging to the faculties of Arts, Commerce, Science are included in the sample. Similarly, two girls colleges at Sangli are selected in order to balance both sexes i.e. girls and boys. The list of these colleges is given under 3.1 of chapter three. In this way a large number of (832) students of both sexes are randomly taken for study. Thus, the sample is made representative of junior college student population of Kolhapur region.

2.3 Tools employed

The following tests are used.

2.3.1 Self Concept Inventory

This inventory is prepared and standardized by V.V. Jogawar, under the guidance of Dr. Pratibha Dee. The test consists of 63 adjectives which are classified into -

1) Socially desirable adjectives
   (Positive aspects, No.36)
2) Socially undesirable adjectives
   (Negative aspects, No.27)

The 63 adjectives are further subclassified into four groups (1) Social, (2) Emotional, (3) Character,
(4) Attitude. In the social, emotional and attitude group, there are nine socially desirable and nine socially undesirable adjectives. In the character group, there are nine socially desirable adjectives only. These 63 adjectives with a 4 point rating scale against each of them formed the Self Concept Inventory for the measurement of the three aspects of the self viz. P.S., S.S. and I.S. (Appendix 1). Appropriate instructions as shown in Appendix 1 are given to the students for the measurement of these three aspects of self concept.

I) Reliability of the test

The test - retest reliability of the test is shown below

Aspects of self concept

<table>
<thead>
<tr>
<th>Coefficient of Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.S.</td>
</tr>
<tr>
<td>.78</td>
</tr>
</tbody>
</table>

The coefficients of reliability are considerably high leaving no doubt about the reliability of the test.

II) Validity of the test

The validity of the test is established by the test constructor. No predictive and concurrent validity could be established of this inventory in the absence of an external criterion. The investigator thought of content validity. For this purpose discussions with five teachers
of Psychology were held. The points of discussion were-

1) Whether the adjectives selected covered the wide range of human personality?

2) Whether the procedure of administration and the instructions were satisfactory?

3) Did the responses of the individual to this test reveal his self concept?

All the judges were in good agreement and expressed their satisfaction about the above mentioned points.

2.3.2 Sinha's Anxiety Scale

This scale is constructed by D.Sinha. It measures general manifest anxiety of the subject and is designed to have differences in individual's reactions to various situations. The scale consists of 100 items in standard form. The statements in the test cover ten dimensions namely 1) health, appearance and injury, 2) ambition (success or failure in work, money and occupation), 3) family anxieties, 4) anxiety regarding friendship and love, 5) worries regarding future, 6) social relations and social approval, 7) worries about civilization, war, virtue, 8) guilt and shame, 9) physical and physiological manifestations, and 10) purely psychological manifestation.

The scale has been developed and standardized on an Indian sample. It constitutes a useful research tool.
For experimental, clinical and counselling purposes. The scale consists of 100 statements, in standard form. It is a self-administering inventory. Each statement has to be answered in terms of "True" or "False" in accordance with the applicability to the individual concerned.

Reliability of the test

The coefficient of reliability was determined by using the split-half and test and retest method. The following table shows the high reliability of the test.

<table>
<thead>
<tr>
<th>Method</th>
<th>N</th>
<th>( \gamma )</th>
<th>Index of reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Split-half</td>
<td>239</td>
<td>.96</td>
<td>.92</td>
</tr>
<tr>
<td>2) Test-retest</td>
<td>88</td>
<td>.73</td>
<td>.85</td>
</tr>
</tbody>
</table>

Validity of the test

The score on Taylor's MAS, as modified by D. Sinha, is used as the first validation criterion. First, Sinha's Anxiety Scale was given to 70 subjects and then Taylor's MAS was administered. The correlation is found to be .69 and it indicates that the two tests are measuring almost the same thing. Hundal (1968) in a study on 200 male students of Punjab University has found scores on the scale to correlate highly with those on other anxiety measures. Against Taylor's Scale, the correlation is .72, against Dutt's Anxiety Questionnaire, it is .72 and against Cattell's IPAT Anxiety Scale Questionnaire, it is .70.
2.3.3 Achievement Motivation Scale

This scale is prepared and standardized by Asha Mohan under the guidance of Dr. Pratibha Deo. She has developed two tests (1) n Ach Test (2) n Ach scale. These have been locally prepared by the investigator on the lines of "Mc Clelland Atkinson Pattern". The n Ach test (separate for males and females) is a set of five pictures (TAT type) suggesting the cues like that of a scene in the library, classroom discussion, technical situation, a race and music. This projective type n Ach test requires expert training in both, administration and scoring. An Achievement Motivation Scale was developed side by side to validate the n Ach projective measure by the investigator herself. This scale is in correspondence with the projective n Ach test. It measures the motivational disposition of the individual who has the desire to do well in the fields of one's liking, meeting challenges and taking life as an intellectual challenge. It is as comprehensive as possible, so as to cover almost all the factors relevant to achievement motive.

The following standardized scales, questionnaires and inventories are taken into consideration while framing items for the present test.

Sheriff's (1948) Intutia Questionnaire, Todd et al (1962) Vocational Goal Questionnaires (VGQ), Bendings (1964) Factor Analytic Scale of need achievement, Edtwistle's (1968)
Academic Achievement Inventory, and Lynn's (1969) Achievement Motivation Questionnaire. All of these various measures supplied a good deal of information to the investigator. This was supplemented by new items based on factors depending on local culture so as to make the scale relevant to the local use.

Items in the Achievement Motivation Scale cover fifteen factors namely, academic motivation, n Ach, academic challenge, n Ach anxiety, importance of grades, meaningfulness of daily college tasks, relevance of school/college to students' future goals, attitudes towards education, work methods, attitude towards teachers, interpersonal relations and expectations of others, individual concern, general interests, dramatics and music, sports, etc.

This scale is a suitable standard verbal measure of achievement motivation in India. It consists of fifty statements. The subjects are to be given one booklet, the instructions are printed in it. The subjects have to rate themselves on each of the statement on a five point scale from "Always" to "Never".

Reliability of the Scale

To see the consistency of the scores yielded by n Ach scale, test retest method of reliability is used on three different samples. The test retest reliability of n Ach scale on different types of groups (mixed, boys and girls) range from 0.67 to 0.78 as shown below.
West-Retest reliability of n Ach scale

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>γ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed</td>
<td>51</td>
<td>.69</td>
</tr>
<tr>
<td>Boys</td>
<td>33</td>
<td>.67</td>
</tr>
<tr>
<td>Girls</td>
<td>50</td>
<td>.78</td>
</tr>
</tbody>
</table>

The present n Ach scale gives a reliability coefficient of .69 for total group which is satisfactory and statistically significant to report.

Validity of the scale

As far as the validity of the n Ach scale is concerned, the item indices were accepted as the validity of the measure and no attempt however, was made to validate it with some criterion measure. The present n Ach scale has been validated with n Ach test of the same author and a coefficient of correlation of .54 has been reported. It is quite satisfactory.

All the contents of the scale suggests that it measures the motivational disposition of the individual who has the desire to do well in the fields of one's liking, meeting challenges and taking life as an intellectual challenge. This is the face validity of the scale.

2.3.4 Non-Verbal Intelligence Test

Standardized progressive matrices are used for measuring intelligence of the subjects. The standardized progressive matrices sets A, B, C, D and E is a test of person's capacity to apprehend meaningless abstract figures, presented
for his observation, to see the relations between them and by so doing to develop a systematic method of reasoning. Though the test is standardized in England, the test being "Non-Verbal" test, the question of language does not arise. The matrices are drawn in a neat and clean manner. The pictures of matrices are just like the pictures of printed cloth in different varieties. In our daily life, we see different varieties of printed cloth. Everybody is somewhat well acquainted with printed clothes, so the difference of culture does not arise. The matrices are easily administered to any age group from 13 to 20 years. The test consists of 60 problems divided into 5 sets of 12 each. Each subject is given a test booklet with an answer sheet to note down the number of the most appropriate answer from many answers already provided for each problem.

Reliability of the test

The test has a retest reliability varying with age from .83 to .93. The study of Parate W.T. (1970) shows the test retest reliability coefficient as .82 for Indian subjects.

Validity of the test

The test correlates .86 with the Terman-Merrill Scale and has been found to have 'g' saturation of .82. The validity coefficient of this test with Non-Verbal Test of intelligence constructed and standardized by Dr. G.H. Nafde on the sample at Bombay and Delhi, is found to be .55. The validity coefficient of progressive Matrices with
Scholastic Aptitude Test in Marathi is found to be .47. It indicates that the standard progressive matrices can work in India and give reliable results.

2.3.5 Goal Discrepancy Score

What percentage of marks do you expect to obtain in XII standard examination? This question, which is included in Self Concept Inventory is asked to each student. This expected percentage is converted into marks, these marks are taken as the expected achievement of each of the student. After the XII standard examination results, the actual achievement of each student is obtained from the college records. By comparing the expected achievement in XII standard examination with actual achievement, goal discrepancy score is obtained. This score is taken as an index of goal discrepancy of the student.

2.3.6. Academic Achievement Score

In the absence of any standardized achievement tests, the marks obtained at the XII standard examination held by the H.S.S.C. Board are considered as achievement scores. They are preferred to any other test results for specific reasons. First, the marks of the XII standard examination represent achievement scores on various subjects like science, humanities and craft. Therefore, these scores are representative of the students achievement. Secondly all the junior college students taken for the study are in the
jurisdiction of one Board, which takes examination at the same time and date, based on the same syllabus.

2.4 Collection of data

The questionnaires carried the necessary instructions and are in printed form. In order to keep administration uniform, the investigator personally visited the junior colleges. Cooperation of Principals and class teachers is taken to collect the data. First, Self Concept Inventory and Sinha's Anxiety Scale are administered. After a 30 minutes rest, Standard Progressive Matrices and Achievement Motivation Scale are administered to the same subjects. Both boys and girls are taken as subjects. Achievement scores are obtained from the college records. For goal discrepancy, the expected achievement is obtained by asking the question in Self Concept Inventory and the actual achievement is obtained from the college records after the examination result.

2.5 Scoring of questionnaires

The method used for scoring the questionnaires is in accordance with the procedure explained below.

2.5.1 Scoring of the Self Concept Inventory

It has already been mentioned that for each adjective a four point rating scale is provided. The four points of the rating scale in descending order are very much, much, little, very little. Scores 4, 3, 2, 1 are respectively
given to these four points in case of a socially desirable adjective. In case of socially undesirable adjective, the scores are reversed for these four points as shown in the two rating scales below.

Socially desirable adjective: Honest  
Very much  Much  Little  Very little  
4  3  2  1

Socially undesirable adjective: Shy  
Very much  Much  Little  Very little  
1  2  3  4

This differential scoring system led to the fact that higher the score the individual gets on this inventory, the more socially desirable he thinks of himself and indicates higher self concept. Lower score shows lower self concept of the individual.

2.5.2 Scoring of Sinha's Anxiety Scale  
Scoring of Sinha's Anxiety Scale is very easy. The scale consists of 100 statements. Each statement which is checked as "Yes" is awarded a score of one. The score of every subject is the total number of statements checked positively. The maximum possible score is 100 and the minimum score is 0. Total score is the anxiety score. That means, first count the "Yes" answers on every page and note down the count numbers on a table on the last page. The total "Yes" answers in the table is the anxiety score.
2.5.3 Scoring of the Achievement Motivation Scale

This scale consists of 50 statements. Out of these, 33 statements are positive and 13 statements are negative. The negative statements are No. 1, 2, 13, 14, 17, 18, 19, 20, 21, 22, 32, 34, 37 and remaining statements are positive. The pattern of scoring is to assign numerical weightage of 5, 4, 3, 2, 1, points to the response always, frequently, sometimes, rarely and never, respectively; in case of positive statements and 1, 2, 3, 4, 5 points to negative statements.

Scoring keys are shown below.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key for negative statements</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Key for positive statements</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

The total score is the summation of positive and negative statements' scores. The minimum possible score is 50 and the maximum possible score is 250. The individual who gets higher score on this scale indicates higher achievement motivation and lower score shows lower achievement motivation.

2.5.4 Scoring of the Non-Verbal Intelligence Test

The standard record form is arranged so that it can be quickly and accurately marked. A person's score on the test is the total number of problems he solves correctly. The scoring work is done quickly and easily with the help
of the following scoring key

<table>
<thead>
<tr>
<th>Problems</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>7</td>
<td>2</td>
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<tr>
<td>5</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>5</td>
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<tr>
<td>7</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>1</td>
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<tr>
<td>8</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Score

2.5.5 Scoring of goal discrepancy

Goal discrepancy score was obtained by comparing the expected achievement in XII Standard examination and actual achievement in the same examination. For the expected achievement score, the expected percentage reported by the student is converted into marks. For the actual achievement score, the total marks actually obtained in the XII standard examination are considered. The
The discrepancy between the two is the score of the goal discrepancy. The goal discrepancy score is said to be positive, if the expected achievement score is higher than the actual achievement score. Similarly the goal discrepancy score is said to be negative, if the expected achievement score is lower than actual achievement score. These scores are used in the frequency distribution.

2.5.6 Score of the Academic achievement

Total marks obtained in XII standard Board Exam are taken as score of academic achievement.

2.6 I) Statistical techniques employed for description of the data

The data based upon the Self Concept Inventory, Sinha's Anxiety Scale, Achievement Motivation Scale, Intelligence Test, Goal Discrepancy score and Academic Achievement Scores are processed statistically in the following ways,

a) Frequency distribution and Frequency polygons

Frequency distributions are calculated and Frequency polygons are plotted.

b) Measures of central tendency and variability

Means, Medians, Modes, Standard deviations, Qs, Percentiles, Sk and Ku are calculated.

c) Standard error of Means and S.D.s

Standard error of means and S.D.s are calculated. Fiduciary limits for mean and S.D. at .05 and .01 levels
are also determined.

All these calculations are done by the investigator.

II) Statistical techniques employed for testing hypotheses

a) Coefficient of correlations

Coefficient of correlations are calculated by the product moment correlation method to study the intercorrelation -ships of the different variables.

b) Correlation ratios

Eta coefficients are calculated to study the curvilinear relationship between self concept (total score), its three aspects, discrepancies between them and academic achievement. The significance of eta coefficients are tested.

c) t ratios

i) t ratio is employed to test how the extreme groups ie. LL (Low on S.C. and Low on Ac.Ach.) and HL (High on S.C. and Low on Ac.Ach.) which are designed to study the causes of curvilinear relationship between self concept (total score), its three major aspects, discrepancies between them and academic achievement differ on anxiety, n Ach and goal discrepancy, keeping the intelligence factor constant.

ii) t ratio is employed to test to what extent the high and low groups on self concept (total score), its three aspects (i.e. P.S., S.S. and I.S.) and discrepancies between them (i.e. P.S.-S.S., I.S.-S.S. and I.S.-P.S.) differ on anxiety, n Ach,
intelligence, goal discrepancy and academic achievement.

d) Two way analysis of variance

The two way classification of analysis of variance with (2 x 2) factorial design is employed to test the main effects of self concept (total score), its three aspects (i.e. P.S., S.S. and I.S.) and discrepancies between them (i.e. P.S.-S.S., I.S.-S.S. and I.S.-P.S.), anxiety, achievement motivation, intelligence and goal discrepancy on academic achievement and interaction effects of these variables on academic achievement.

2.7 Operational definitions of the terms

1) Self Concept:- A sum total of the individual's ideas he holds about his own abilities, attitudes, dispositions, interests, feelings, etc; his perception of himself as expressed through a list of adjectives.

2) Perceived Self:- How one feels he is like. That is what type of person he thinks he is.

3) Social Self:- How one feels others perceive him; his perception of other's ideas about himself.

4) Ideal Self:- What type of person one would like to be.

5) P.S.-S.S.: Discrepancy between perceived self and social self.
6) I.S.-S.S.*- Discrepancy between ideal self and social self.

7) I.S.-P.S.*- Discrepancy between ideal self and perceived self.

8) Anxiety* - Anxiety is a generalised and diffused fear response to aspects of the environment.

9) Achievement Motivation - Achievement motivation is behaviour which shows efforts to do one's best, to do better than others, to excel others or in general to accomplish something to one's satisfaction.

10) Intelligence* - Intelligence is an ability to learn and achieve success in academic field.

11) Goal Discrepancy* - Goal discrepancy is the difference between the expected achievement and the actual achievement.

12) Academic Achievement* - Marks obtained at the XII standard examination is taken as the academic achievement score.