CHAPTER-III
METHODOLOGY AND PROCEDURE

- Design
- Variables
- Hypotheses
- Tools
CHAPTER-III

Research Design and Methodology

This chapter focuses mainly on the nature of design, hypotheses, sample, tools of data collection and tools of statistical analysis which have been applied to study Prosocial behaviour and its psycho-social correlates.

The nature of the present study is Expost-facto cum correlational research which deals with the dependent variable prosocial behaviour in relation to Gender, Family type, SES, Emotional competence and Social competence. Expost-facto research is in which the researcher starts with the observation of dependent variable or variables. He then studies the independent variables in retrospect for their possible relations and effect on the dependent variable or variables. Moreover in Expost-facto research the researcher does not have direct control on independent variables because their manifestations have already occurred or because they inherently are not manipulable. The variables of this study are the attributes which are already present in the subject. These are not active variables. In other words it can be said that none of the dependent variables are subject to direct manipulation and are manipulated through selection only, so the present study has a fixed model.

The present study is an Expost-facto study in which an attempt has been made to control independent variables by matching and selection. This method is not said to be too much accurate on scientific background. Despite its weakness much Expost-facto researches have been done in psychology, sociology and education simply because many research problems do not lend themselves to experience to enquiry the variable remain not manipulable. It can be said that "Expost-facto" research is more important than experimental research. Such experiments can
improve upon their inherent shortcomings and inherent qualities by using sensitive statistical techniques.

**Design**

As stated earlier, this investigation has a multi-variate frame-work which has been made more effective by lending a factorial design $2 \times 2 \times 3$ three factor factorial frame-work. The research comprises of three $2 \times 2 \times 3$ tri-variate experiments. The factorial experiment, which was formerly known as complex experiment was named such by Fisher in 1926 and was followed by Yates in 1935. At present, an experiment containing several levels of many independent variables is known exclusively as factorial experiment (Federer 1955).

The advantage of the use of factorial design is that it always provides us with the control of a secondary variable by making it a secondary independent variable. This is the most desirable of all controlling techniques because it not only controls that variable but also tells us numerically how much variation in the dependent variable is due to that variable. On the other hand, it allows the experimenter to study the effect of more than one variable at a time and also provides the comparative effectiveness of the independent variables. The best advantage of factorial design is that it helps in determining important interactions, which cannot occur unless two or more independent variables has been involved.

**Problem**

A study of psycho-social correlates of Prosocial behaviour among Adolescents.

**Variables**

In this study variables have been taken to prove the hypotheses and for finding conclusions. A variable as the name implies, is something which varies from the point of view of a behavioural scientist, variables may be defined as those attributes of objects, events, things and being,
which can be measured, prominent variables to study are Prosocial behaviour, Emotional Competence, Social Competence, Age, Sex, Socio-economic status and Family type.

(a) **Independent Variable**

Independent variable is manipulated by the experimenter and its effect is examined upon the Dependent variable. In this study independent variables are Sex, Family Type and SES. In our study independent variables are Type-S independent variable (which is manipulated through the process of selection only).

(b) **Dependent Variables**

In present study dependent variables are Prosocial behaviour, Emotional Competence and Social Competence.

(c) **Controlled Variables**

Types of Variables and techniques of Controls

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Types of Variables</th>
<th>Variables</th>
<th>Techniques of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Subject Relevant</td>
<td>1. Age</td>
<td>Constancy (Only Adolescents)</td>
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<tr>
<td></td>
<td>Variables</td>
<td>2. Race</td>
<td>Randomization</td>
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<td></td>
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<td>3. Aptitude</td>
<td>Randomization</td>
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<td></td>
<td></td>
<td>4. Religion</td>
<td>Randomization</td>
</tr>
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<td></td>
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<td>5. Status</td>
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<td>B.</td>
<td>Situational Relevant Variables</td>
<td>1. Family typical difference</td>
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<tr>
<td></td>
<td></td>
<td>2. Time</td>
<td>Constancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Test</td>
<td>Constancy</td>
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<tr>
<td></td>
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<td>4. Instruction</td>
<td></td>
</tr>
<tr>
<td>C.</td>
<td>Sequence Relevant Variables</td>
<td>1. Practice Effects</td>
<td>Elimination</td>
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<tr>
<td></td>
<td></td>
<td>2. Fatigue</td>
<td>Elimination</td>
</tr>
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**Hypotheses**

1. Females are more prosocially activated than males.

2. Adolescents of nuclear family are less prosocially activated than adolescents of joint family.
3. Middle class (SES) adolescents are more prosocially activated than both other classes as upper class and lower class.

4. Gender and family structure have its interactional impact on prosocial behaviour.

5. Gender and SES both have its interactional impact on pro-social behaviour.

6. Family structure and SES have its interactional impact on prosocial behaviour.

7. Gender, family structure and SES have its interactional impact on pro-social behaviour.

8. Females are emotionally competent than males.

9. Adolescents of nuclear family are less emotionally competent than adolescents of joint family.

10. Middle class (SES) adolescents are emotionally competent than both other classes as upper class and lower class.

11. Gender and family structure have its interactional impact on emotional competence.

12. Gender and SES both have its interactional impact on emotional competence.

13. Family structure and SES have its interactional impact on emotional competence.

14. Gender, family structure and SES have its interactional impact on emotional competence.

15. Females are socially competent than males.

16. Adolescents of nuclear family are less socially competent than adolescents of joint family.
Middle class (SES) adolescents are more socially competent than both other classes as upper class and lower class.

Gender and family structure have its interactional impact on social competence.

Gender and SES both have its interactional impact on social competence.

Family structure and SES have its interactional impact on social competence.

Gender, family structure and SES have its interactional impact on social competence.

Sub Hypotheses

i. Males of Joint family upper class are less altruistic than females of Joint family upper class.

ii. Males of Joint family middle class are less altruistic than females of Joint family middle class.

iii. Males of Joint family lower class are less altruistic than females of joint family lower class.

iv. Males of nuclear family upper class are less altruistic than females of nuclear family upper class

v. Males of nuclear family middle class are less altruistic than females of nuclear family middle class.

vi. Males of nuclear family lower class are less altruistic than females of nuclear family lower class.

vii. Males of nuclear family are less altruistic than males of joint family.
viii. Females of nuclear family are less altruistic than females of joint family.

ix. Males of upper class are less altruistic than males of middle class.

x. Males of lower class are less altruistic than males of middle class family.

xi. Males of upper class family are less altruistic than males of lower class family.

xii. Females of upper class are less altruistic than females of middle class.

xiii. Females of lower class are less altruistic than females of middle class family.

xiv. Females of upper class family are less altruistic than females of lower class family.

xv. Males of joint family upper class are less emotionally competent than females of joint family upper class.

xvi. Males of joint family middle class are less emotionally competent than females of joint family middle class.

xvii. Males of joint family lower class are less emotionally competent than females of joint family lower class.

xviii. Males of nuclear family upper class are less emotionally competent than females of nuclear family upper class.

xix. Males of nuclear family lower class are less emotionally competent than females of nuclear family middle class.

xx. Males of nuclear family lower class are less emotionally competent than females of nuclear family lower class.

xxi. Males of nuclear family are less emotionally competent than males of joint family.
xxii. Females of nuclear family are less emotionally competent than females of joint family.

xxiii. Males of upper class are less emotionally competent than males of middle class.

xxiv. Males of lower class are less emotionally competent than males of middle class family.

xxv. Males of upper class family are less emotionally competent than males of lower class family.

xxvi. Females of upper class family are less emotionally competent than females of lower class family.

xxvii. Females of lower class are less emotionally competent than females of middle class family.

xxviii. Females of upper class family are less emotionally competent than females of lower class family.

xxix. Males of joint family upper class are less socially competent than females of joint family upper class.

xxx. Males of joint family middle class are less socially competent than females of joint family middle class.

xxxi. Males of joint family lower class are less socially competent than females of joint family lower class.

xxxii. Males of nuclear family upper class are less socially competent than females of nuclear family upper class.

xxxiii. Males of nuclear family middle class are less socially competent than females of nuclear family middle class.

xxxiv. Males of nuclear family lower class are less socially competent than females of nuclear family lower class.
xxxv. Males of nuclear family are less socially competent than males of joint family.

xxxvi. Females of nuclear family are less socially competent than females of joint family.

xxxvii. Males of upper class are less socially competent than males of middle class.

xxxviii. Males of lower class are less socially competent than males of middle class family.

xxxix. Males of upper class family are less socially competent than males of lower class family.

xl. Females of upper class are less socially competent than females of middle class.

xli. Females of lower class are less socially competent than females of middle class family.

xlii. Females of upper class family are less socially competent than females of lower class family.

The main dependent variable, Prosocial behaviour, is correlated with two other dependent variables as Emotional Competence and Social Competence.

➢ Emotional competence is positively correlated with altruistic behaviour.

➢ Social competence is positively correlated with altruistic behaviour.

The Sampling

The study comprises the sample of 360 adolescents boys and girls within the age group of 15-19 years (Adolescent) for this purpose of the
study we have used **Stratified Random Sampling**. Here, the population is divided into three criterion such as Gender, family type, and Socio-economic status yielding twelve strata namely females of joint family from upper class, females of joint family from middle class, females of joint family from lower class, females of nuclear family from lower class, females of nuclear family from middle class, females of nuclear family from upper class, males of joint family from lower class, males of joint family from middle class, males of joint family from upper class, males of nuclear family from lower class, males of nuclear family from middle class, males of nuclear family from upper class. These divided populations are called sub-population which are non-overlapping and together constitute the whole population. Having divided the population into twelve strata which are considered to be homogenous internally, a simple random sample for 30 subjects in each group is taken from each population stratum.

The requirement of the study was **stratified random sampling** because we have to create some groups having some specific attributes. In this way we have to measure three independent variables in terms of three dependent measures.

**The Final Sample**

To assess the final sample of 360 we approached more than three times of the numbers of subjects we actually desired, among all of them we sort out the subjects in 12 categories. First there was applied random technique in selecting subjects at preliminary level. These adolescents were from colonies, colleges and institutes. In such a way they comprise different attributes of different population. Again random selection was done within each group in which we have already selected approximately
more than 100 subjects in each category cell. In such a way we found the ultimate number of 30 subjects in each category cell.

**Tools**

**Altruism Scale (ALTS)**

Altruism scale was prepared by Dr. S.N. Rai and Dr. Samvat Singh. The test was constructed to measure altruistic skill of respondents. The coverage of items of the tool, i.e., altruistic scale deals with almost each important domain of altruistic and helping behaviour of school going children and college going adolescents. Home, school, play, emergency and general behaviour situations were included in the scale. The opinion of the experts was taken into consideration.

**Reliability**

Reliability of altruistic scale, was determined by test retest method. After one month interval retest was done. The reliability coefficient was .84 with reliability index of .92 which was statistically significant. The obtained reliability coefficient indicates that the scale possesses a fair amount of stability assessing the extent of altruism.

**Validity**

- Content validity of the test has been increased due to opinion of experts and covering a wide area of situational reactions.
- The high value of test-retest reliability coefficient of altruistic scale, shows considerable degree of intrinsic validity.
- Extrinsic validity in order to determine the extrinsic validity of the scale in its final form with 30 items and semi-projective 11 instructions, 40 teachers cum guardians of the Ss were included in the sample. The instructions of the scale for the guardians were modified.
Scoring

The responses obtained in the form of tick marks (✓) on 30 times of altruistic scale are quantified. Each item of the scale has three alternative responses, i.e., altruistic, neutral and egoistic.

A score of two for altruistic, one for neutral and zero for egoistic is awarded to each of the scale. The maximum score is 60 and the minimum is zero.

Emotional Competence Scale

Emotional competencies scale was made by H.C. Sharma and R. Bhardwaj. This scale has been prepared to measure five different emotional competencies as, Adequate depth of feeling, Adequate expression and control of emotions, Ability to function with emotions, Ability to cope with problem emotions and Encouragement of positive emotions. At the first instance, fifty experts were asked to provide well suited items, which can measure five emotional competencies separately and objectively. Fifteen items were selected to be of higher scale value to measure each emotional competency with a provision of five alternative responses. Firstly, it was administered on 100 postgraduate students to determine Emotional competencies score separately. Items of high coefficient of correlation were selected. Finally it was administered to a sample of 200 students and competency scores were determined.

Reliability and Validity

The reliability of the scale has been derived by employing two methods, viz., test-retest and split-half method. The obtained co-efficient of reliability may be enumerated as under:
Coefﬁcient of Reliability (N= 100)

<table>
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<th>Method</th>
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<tbody>
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<td>B</td>
</tr>
<tr>
<td>Test-Retest</td>
<td>ADF</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>(Interval 21 days)</td>
<td></td>
</tr>
<tr>
<td>Split-half</td>
<td>.71</td>
<td>.79</td>
</tr>
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</table>

The validity of this scale has been determined with factor A and C of 16 personality factor questionnaire and found to be .64 and .69 respectively.

Scoring

It is a ﬁve point scale based on the lines of Likert having ﬁve alternatives of each item. Scoring of these ﬁve alternatives follow a system of 1,2,3,4 and 5 from upper to lower end. The item-wise scores are to be transferred to the table given on last page of the scale to obtain different competencies scores. The addition of item scores horizontally will provide scores of the competencies for A,B,C,D and E separately. The obtained competencies scores are to be converted into Z scores with the help of table number two. The addition of converted Z-scores for ﬁve competencies vertically will provide the score for emotional competence. If one wishes to work on each competency separately, then he should work with these converted Z-scores for easy and meaningful interpretations.

Social Competence Scale

This Social Competence Scale has been prepared by Dr. V.P. Sharma, Dr. (Mrs.) Prabha Shukla, Dr. (Mrs.) Kiran Shukla to measure social competence. Despite great signiﬁcance of social
competence in the process of adaptation of modern civilization, relatively little attention has been paid by the social scientist in its measurement. Rochester Adaptive Behaviour Inventory (RABI) has been revised by Jones (1981) which claims to measure social competence on 12 dimensions. This revision was found entirely an invalid instrument for measuring social competence of pre-school Indian children. Kohn's (1977) two factor model was to judge American children. The model needs to be redefined in terms of Indian socio-cultural norms and values. Such a rationale questioned the appropriateness and relevance of both the measures of social competence for their application over Indian children. Meaningfulness of a valid measure of social competence for the Indian children, therefore, essentially needs the incorporation and inclusions of Indian social norms and values and to be designed in such a way as to get expression of the composite culture of India; and should meet the needs and demands of social skills and interpersonal behaviour of Indian social settings and cultural patterns.

(a) Reliability

The coefficient of temporal stability employing Test-Retest method with an interval of 20 days has been estimated to be $r_{tt} = .56$ whereas the coefficient of inter-rater reliability has been found to be $r_{rr} = .67$

(b) Validity

Apart from the item validity as analyzed above the SC scale (English version) has been validated against Kohn's Social competence scale and a predictive validity to the extent of $r = .72$ was obtained. Further the English and Hindi version of the Sc scale was found to be correlated to the extent of $r = .84$. 

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Scoring

The scale of social competence is a five point scale. The responses are categorized in five levels of social competence (i.e., very high, high average, low, very low) in sequence these responses were scored 5, 4, 3, 2, 1. Then all the scores have been added to find social competence score.

Tools of Statistical Analysis

In order to see the effect of gender, family type and SES on Adolescents' prosocial behaviour, emotional competency and Social competency, we have calculated mean and variance. Analysis of variance and correlation has also been calculated.

(a) Mean

Mean rather than medium or mode was used as a measure of central tendency of distribution of scores Prosocial Behaviour, Emotional Competency and Social Competency.

The formula of mean is as follows:

\[ M = \frac{\Sigma x}{N} \]

Where

\[ M = \text{Mean} \]
\[ \Sigma x = \text{Sum of Scores} \]
\[ N = \text{Number of Scores} \]

(b) Standard Deviation

Standard deviation as a measure of variability was used because it goes with mean as a suitable for this kind of data obtained in the present study. The formula of S.D. is as follows :-
S.D. or $\sigma = \sqrt{\frac{\Sigma fx^2}{N}}$

Where,

$N = \text{Number of items}$

$\Sigma fx = \text{Sum of the product of frequencies and deviation}$

$\sigma = \text{Standard Deviation}$

(c) **Correlation:**

Coefficient of correlation was computed to find out the correlation between Prosocial Behaviour, Social Competence and Emotional Competence of adolescents. To find the degree of correlation we use the method of Karl Pearson's coefficient of correlation. This is symbolised by '$r$'. Therefore the coefficient of correlation between two variables 'x' and 'y' is given by the formula:

$$r = \frac{\Sigma (x - \bar{x})(y - \bar{y})}{\sqrt{\Sigma (x - \bar{x})^2} \sqrt{\Sigma (y - \bar{y})^2}}$$

(d) **F-Test**

The basic steps of 'ANOVAR' may be enumerated as under:

(a) The necessary ingredients of all the groups are determined.

$\Sigma X; \Sigma X^2; n; (\Sigma X)^2 / n; \bar{X}$

(b) Sum, of squares (SS)

(i) **Total SS**

$$(\Sigma X_1^2 + \Sigma X_2^2 + \Sigma X_n^2 - \frac{(\Sigma X_1 + \Sigma X_2 + \Sigma X_3 + \ldots \ldots \Sigma X_n)^2}{N})$$

(ii) **Treatment SS**

$$(\Sigma X_1 / n_1 + (\Sigma X_2)^2 / n_2 + (\Sigma X_3)^2 / n_3 + (\Sigma X_n)^2 / n_n \ldots \ldots - \frac{(\Sigma X_1 + \Sigma X_2 + \Sigma X_3 + \ldots \ldots \Sigma X_n)^2}{N})$$
(iii) **Error SS**

Total SS - Treatment SS

(c) Analysis of Treatment SS:

(i) Main Effects

A

B

C

(ii) Bi-variate Interactions

A x B

A x C

B x C

(iii) Tri-variate Interactions

A x B x C

(d) Determining df. (Degree of Freedom):

Total df = N - 1

Treatment df = r - 1 (r is the no. of groups)

Error df = N - r

(e) Determining Mean Squares

Mean Square = \( \frac{SS}{df} \)

(f) Obtaining 'F' Values

\[ F = \frac{\text{Treatment Mean Square}}{\text{Error Mean Square}} \]

(g) Determining Significance of 'F' Values

Ref - Table No. 9.11

McGuigan, F.J. - Experimental Psychology

New Delhi, 1969.
(h) 'ANOVAR' Summary

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<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df.</th>
<th>Mean sq.</th>
<th>F.</th>
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<td>Error</td>
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