CHAPTER III

THE RESEARCH STRATEGY
In the foregoing chapter a brief review of the researches conducted in the area related to the present investigation was presented. The review of literature gave the researcher an understanding of the previous work that has been already done in the area. It enabled the researcher to know the means of getting into the frontier in the field of her study and to formulate a sound strategy for the present investigation which is being presented in this chapter as under.

3.1. AIMS AND OBJECTIVES

The study was conducted to find out the role of four non-cognitive personality variables viz. locus of control, Delay of gratification, risk-taking behaviour and task-persistence in determining academic achievement of the male and female Higher Secondary Students. It was argued that if these variables are the determinants then there would be significant correlation between these variables and the academic achievement. If academic achievement could be predicted by these variables, their regression coefficients in multiple regression equations would also be significant. Needless to say that multiple correlation would also be significant. On the basis of this argument the following objectives of the study were formulated:

3.1.1. MAJOR OBJECTIVES

The major objectives of the study were:

1. To study the independent effect of the predictive variables viz. locus of control, delay of gratification, risk-taking behaviour and task-persistence on the criterion variable i.e., academic achievement.

2. To study the two factor interactional effect of the predictive variables on the criterion variable.

3. To study the three factor interactional effect of the predictors on criterion variable.
4. To study the four factor interactional effect of the predictive variables on the criterion variable.

5. To ascertain the zero-order relationship between academic achievement and non-cognitive factors viz. Locus of control, delay of gratification, risk-taking behaviour and task-persistence.

6. To study the relative contributory role of the locus of control, delay of gratification, risk-taking behaviour and task-persistence in determining the academic achievement of the students.

7. To predict the academic achievement of the students on the basis of the non-cognitive factors viz. locus of control, delay of gratification, risk-taking behaviour and task-persistence.

3.1.2. SUBSIDIARY OBJECTIVE

In order to accomplish the above mentioned objectives the following concomitant objective has also been realized:

To study the nature of the distribution of criterion and predictive variables under study.

3.2. DELIMITATIONS OF THE STUDY

Keeping in view the limited resources, time and facilities at the disposal of the investigator, the present study was delimited to the area and scope of the population, as well as the content of the study.

The study was delimited to urban area of the Agra district. As regards the population, the students of both the sexes, between the age of 15+ to 18 years and studying in XI class of the science stream of various Intermediate Colleges (affiliated to U.P. Board of Education, Allahabad) were considered.

Further, the study was limited to only two levels of each predictive variable.

3.3. VARIABLES

The variables of the study were classified as under:

(i) Criterion/Dependent variable: Academic achievement
(ii) Predictive/Independent variables: Locus of Control, Delay of gratification, Risk-taking behaviour & Task-persistence.

(iii) Moderator variables: Sex

(iv) Intervening variables: Level of motivation, brought by the subject in testing condition.

(v) Control variables: Age, Level of Education and SES.

3.4. BASIC ASSUMPTIONS

In the present investigation the following assumptions were made and the entire body of conclusions will be valid to the extent of the validity of these assumptions.

(A) Related to tools

It was assumed that an individual while responding to the various situations in different tests (Locus of Control, Delay of gratification Risk-taking behaviour) is identifying himself with the situation in the test items and reacts accordingly.

(B) Related to Population and Sample

(i) The selected segments of the population on which the present investigation is based was a part of the total population.

(ii) The age reported and recorded by the subjects was considered as their correct age.

(iii) The results obtained on the basis of the small segment of the population under study is applicable to the total population.

(C) Related to the Cultural Factors

In a vast country as India, inspite of its complex components of various languages, cultures, religions, societies, castes etc., it is assumed that the aforesaid differences do not affect the criterion variable since the vast majority of the subjects are Indians hailing from a common cultural heritage.
(D) Related to the Family background and its types

In the present context it has been assumed that the subjects are not influenced by their family background and the type of the family they come from, with regard to their academic achievement and different predictive variables.

3.5. HYPOTHESES

In relation to the present investigation, the hypotheses were stated in null form because:

(i) Studies reported in Chapter-II make it clear that no consensus has been found among the researches about the nature and extent of relationship between academic achievement and the independent variables selected in the study.

(ii) Null hypothesis is the most parsimonious hypothesis, whenever the knowledge about the relationship between the two variables is not definitely known.

Therefore the investigator considered it proper to state all the hypotheses in null form. The hypotheses thus formed in relation to the present investigation are:

\[ H_1 \] The subjects (male-female) having Internal-external Locus of Control do not differ significantly in their academic achievement.

Total sub-hypotheses: \( 2 \times 1 = 2 \)

\[ H_2 \] The subjects (male-female) of high and low Delay of gratification do not differ significantly in their academic achievement.

Total sub-hypotheses: \( 2 \times 1 = 2 \)

\[ H_3 \] The subjects (male-female) of high and low risk-taking behaviour do not differ significantly in their academic achievement.

Total sub-hypotheses: \( 2 \times 1 = 2 \)

\[ H_4 \] The subjects (male-female) of high and low Task-persistence do not differ significantly in their academic achievement.

Total sub-hypotheses: \( 2 \times 1 = 2 \)
**H₅** — The levels of Delay of gratification do not account for significant variation in academic achievement of the subjects (male-female) having Internal-External Locus of Control and Vice-Versa.

Total sub-hypotheses : $2 \times (2 \times 2) = 8$

**H₆** — The levels of Risk-taking behaviour do not account for significant variation in academic achievement of the subjects (male-female) having Internal-External Locus of Control.

Total Sub-hypotheses : $2(2 \times 2) = 8$

**H₇** — The levels of Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having Internal-External Locus of Control and vice-versa.

Total sub-hypotheses : $2(2 \times 2) = 8$

**H₈** — The levels of Delay of gratification do not account for significant variation in academic achievement of the subjects (male-female) having high and low Risk-taking behaviour and vice-versa.

Total sub-hypotheses : $2(2 \times 2) = 8$

**H₉** — The levels of Delay of gratification do not account for significant variation in academic achievement of the subjects (male-female) having high and low Task-persistence.

Total Sub-hypotheses : $2(2 \times 2) = 8$

**H₁₀** — The levels of Risk-taking behaviour do not account for significant variation in academic achievement of the subjects (male-female) having high and low Task-persistence and vice-versa.

Total Sub-hypotheses : $2(2 \times 2) = 8$

**H₁₁** — The interactional effect of Delay of gratification and Risk-taking behaviour do not account for significant variation in academic achievement of the Internals and Externals.

Total sub-hypotheses : $2 \times (2 \times 2 \times 2) = 16$
The interactional effect of Delay of gratification and Task-persistence do not account for significant variation in academic achievement of the Internals and Externals.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$

The interactional effect of Risk-taking behaviour and Task-persistence do not account for significant variation in academic achievement of the Internals and Externals.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$

The interactional effect of Locus of Control and Risk-taking behaviour do not account for significant variation in academic achievement of the subjects (male-female) having high and low Delay of gratification.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$

The interactional effect of Locus of Control and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having high and low Delay of gratification.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$

The interactional effect of Risk-taking behaviour and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having high and low Delay of gratification.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$

The interactional effect of Locus of Control and Delay of gratification do not account for significant variation in academic achievement of the subjects (male-female) having high and low Risk-taking behaviour.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$

The interactional effect of Locus of Control and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having high and low Risk-taking behaviour.

Total sub-hypotheses : $2(2 \times 2 \times 2) = 16$
\( H_{19} \) The interactional effect of Delay of gratification and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having high and low Risk-taking behaviour.

Total sub-hypotheses: \( 2(2 \times 2 \times 2) = 16 \)

\( H_{20} \) The interactional effect of Locus of Control and Delay of gratification do not account for significant variation in academic achievement of the subjects (male-female) having high and low Task-persistence.

Total sub-hypotheses: \( 2(2 \times 2 \times 2) = 16 \)

\( H_{21} \) The interactional effect of Locus of Control and Risk-taking behaviour do not account for significant variation in academic achievement of the subjects (male-female) having high and low Task-persistence.

Total sub-hypotheses: \( 2(2 \times 2 \times 2) = 16 \)

\( H_{22} \) The interactional effect of Delay of gratification and Risk-taking behaviour do not account for significant variation in academic achievement of the subjects (male-female) having high and low Task-persistence.

Total sub-hypotheses: \( 2(2 \times 2 \times 2) = 16 \)

\( H_{23} \) The interactional effect of Delay of gratification, Risk-taking behaviour and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) at different levels of Locus of Control.

Total sub-hypotheses: \( 2(2 \times 2 \times 2 \times 2) = 32 \)

\( H_{24} \) The interactional effect of Locus of Control, Risk-taking behaviour and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having different levels of Delay of gratification.

Total sub-hypotheses: \( 2(2 \times 2 \times 2 \times 2) = 32 \)
$H_{25}$ — The interactional effect of Locus of Control, Delay of gratification & Risk-taking behavior do not account for significant variation in academic achievement of the subjects (male-female) having different levels of Task-persistence.

Total sub-hypotheses : $2(2 \times 2 \times 2 \times 2) = 32$

$H_{26}$ — The interactional effect of Locus of Control, Delay of gratification and Task-persistence do not account for significant variation in academic achievement of the subjects (male-female) having different levels of Risk-taking behaviour.

Total sub-hypotheses : $2(2 \times 2 \times 2 \times 2) = 32$

$H_{27}$ — There is no significant zero-order relationship between the criterion variable and predictive variables.

Total sub-hypotheses : $2(4) = 8$

$H_{28}$ — All predictive variables are equally important in determining the academic achievement of the subjects (male-female).

Total sub-hypotheses : $2 \times 1 = 2$

$H_{29}$ — The multiple relationship does not exist between criterion variable and predictive variables.

Total sub-hypotheses : $2 \times 1 = 2$

3.6. SAMPLE

The sample of the study consisted of 305 female and 277 male students of the age group between 15+ to 18 years and studying in the XI class of eight Intermediate colleges of Agra City.

3.7. METHOD OF THE RESEARCH

In the present study the *Ex-Post Facto* method of research was adopted in which multivariate factorial design is used to give natural operation setting to variables and studying interactions among independent variables. The *Ex-Post-Facto* research is a systematic empirical inquiry in which scientist does not have direct control of independent variables.
because their manifestations have already occurred or because they are inherent not manipulable. Inferences about relations among variables are made without direct intervention from inherent variation of independent and dependent variables (Kerlinger, 1978).

In the study locus of control, Delay of gratification, risk-taking behaviour and task-persistence have already occurred and only their dependent variable; Academic achievement remain under research observation and analysis i.e. the independent variables (Locus of Control, Delay of gratification, Risk-taking behaviour & Task-persistence) have been studied in retrospect for their possible relation to and effects on the dependent variable-academic achievement, since none of the four variables are subject to direct manipulation and are manipulated through selection only.

### 3.8. DESIGN OF THE STUDY

The present study seeks to investigate, not only the independent influence of the four predictive variables viz. Locus of Control, Delay of gratification, Risk-taking behaviour and Task-persistence, but also the two-factor; three-factor and four-factor interactional effects of the four independent variables on the criterion variable. Therefore in the present investigation $2 \times 2 \times 2 \times 2$ factorial design (two levels of each variable) has been used separately for boys and girls.

All the independent variables were manipulated through selection on two levels as follows:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Locus of Control</td>
<td>internal–external</td>
</tr>
<tr>
<td>2. Delay of gratification</td>
<td>high–low</td>
</tr>
<tr>
<td>3. Risk-taking behaviour</td>
<td>high–low</td>
</tr>
<tr>
<td>4. Task-persistence</td>
<td>high–low</td>
</tr>
</tbody>
</table>

The paradigm of the design showing the juxtaposed position of the four variables to obtain both independent and interactional effects on the dependent variable, may be presented as under.
Paradigm of the research design showing juxtaposed position of the four variables to obtain independent and interaction effects.

Where: LOC—Locus of control, DOG—Delay of gratification, RTB—Risk-taking behaviour, TP—Task persistence
3.9. CONTROL OF EXTRANEOUS VARIABLES

The extraneous variance is controlled by identification of effective variables and using effective strategy of control. The subject relevant variables, situation relevant variables and sequence relevant variables as described by D'Amato (1970), have been controlled through various types of control techniques, as under:

<table>
<thead>
<tr>
<th>Extraneous Variance</th>
<th>Technique of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Subject Relevant Variable</strong></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td>Constancy (15+ to 18 years)</td>
</tr>
<tr>
<td>2. Sex,</td>
<td>constancy</td>
</tr>
<tr>
<td>3. Caste</td>
<td>Randomization</td>
</tr>
<tr>
<td>4. Religion</td>
<td></td>
</tr>
<tr>
<td>5. Occupation</td>
<td></td>
</tr>
<tr>
<td>6. Intelligence</td>
<td></td>
</tr>
<tr>
<td>7. Aptitude</td>
<td></td>
</tr>
<tr>
<td><strong>B. Situation Relevant variables</strong></td>
<td></td>
</tr>
<tr>
<td>1. Temperature</td>
<td>Constancy</td>
</tr>
<tr>
<td>2. Humidity</td>
<td>Constancy</td>
</tr>
<tr>
<td>3. Noise</td>
<td>Elimination</td>
</tr>
<tr>
<td>4. Lightning level</td>
<td>Constancy</td>
</tr>
<tr>
<td>5. Time of the study</td>
<td>Constancy</td>
</tr>
<tr>
<td>6. Culture</td>
<td>Constancy</td>
</tr>
<tr>
<td>7. Institutional difference</td>
<td>Selection</td>
</tr>
<tr>
<td>8. Socioeconomic Status</td>
<td>Selection</td>
</tr>
<tr>
<td><strong>C. Sequence Relevant variables</strong></td>
<td></td>
</tr>
<tr>
<td>1. Practice</td>
<td>Elimination</td>
</tr>
<tr>
<td>2. Fatigue</td>
<td>Elimination</td>
</tr>
<tr>
<td>3. Monotony</td>
<td>Elimination</td>
</tr>
</tbody>
</table>