CHAPTER VI
CHAPTER VI

DETERMINING THE NATURE OF DECISION-MAKING ABILITY

6.01 Introduction

6.02 Preparation of material
  6.02.1 Survey
  6.02.2 Selection
  6.02.3 Adaptation and modification

6.03 Tools

6.04 Sample

6.05 Hypotheses

6.06 Test administration

6.07 Scoring and data analysis

6.08 Observations
  A. Decision-making ability correlated with other abilities.
  B. The personality of good decision-makers
  C. The distinction between good and poor decision makers
  D. Adjustments at home and school

6.09 Factor analysis

6.10 Summary
CHAPTER VI

DETERMINING THE NATURE OF DECISION-MAKING ABILITY

6.01 INTRODUCTION

In order to identify the nature of decision-making ability, it was essential to study the cognitive and non-cognitive factors involved in or associated with it.

The review of studies undertaken threw some light on the factors affecting decision-making. The factors included were intelligence, intuition, environment, family relations, sex, age and the personality factors such as confidence, anxiety, depression, dogmatism, extraversion, reflectiveness or impulsiveness and rigidity etc.*

The literature on decision-making though was available in abundance, failed to produce the clear-cut outcomes, and the nature of decision-making ability so far remained unidentified. As 'Identification of Decision-Making Ability' was the prime objective of the present study, this part dealt with -

A. Choosing the variables that could be related to the decision-making ability,
B. Selecting the tools measuring the chosen variables,
C. Adapting or modifying the selected tools, and
D. Correlating these variables with the decision-making ability in order to determine its nature.

* The details are documented in Chapter - II.
6.02 PREPARATION OF MATERIAL

6.02.1 Survey

The factors influencing decision-making were enlisted with the help of isolated studies in the available literature, the discussions with teachers, youth leaders and psychologists. These included factors such as intelligence and intuition. Here the wholistic view was noted and diagnosis about the factors of intelligence responsible for decision-making were not pointed out.

The non-cognitive factors such as age, sex, the personality characteristics like confidence, self-sufficiency and the adjustment with the surrounding were also noted as significant factors influencing decision-making of an individual.

Some other variables - such as verbal and behavioural reasoning and the personality characteristics like sociability, tough-mindedness were felt influential and so were noted down.

Hence the available tools measuring mental ability, verbal and behavioural reasoning; and the questionnaires providing the picture of the individual's personality characteristics and adjustment with his surroundings were surveyed.\footnote{A list of tools surveyed is provided in Appendix - K.} It revealed that -
- the tools measuring most of the chosen variables were available,
- most of these tools were prepared for Indian sample,
- some of the tools were standardized while many of them were not, and
- the tools were in different languages such as Hindi, Marathi and English.

6.02.2 Selection

The selection of tools was made on the basis of -
- applicability to the sample of desired age group,
- its potential to reveal the desired information,
- availability,
- language,
- convenience of administration and scoring as well as clarity in comprehending, and
- the maximum time required.

Thus, a standardized test of intelligence - Standard Progressive Matrices (Raven, 1960), the standardized test of Verbal and Behavioural Reasoning ability (JPIP, 1984) based on Guilford's (1971) SI Model, were selected.

Among the available tools throwing light on the individuals' personality, Jr. Sr. High School Personality Questionnaire - HSPQ*¹ (Cattell and Cattell, 1969) was

*¹ The short-form that would be used henceforth to denote Jr. Sr. High School Personality Questionnaire
found to be the most suitable as it measured 14 traits, out of which 10 were of major concern in the present study, and it availed the description of both the ends of a continuum of a particular personality trait.

Another tool*1 adapted by Dr. Usha Khire was found suitable for measuring 'sociability' and 'self-confidence' in children, whereas the School and Home Adjustment inventories originally adapted at JPIP were felt appropriate for the present research.

Only one scale - 'The Gough-Sanford Rigidity Scale' constructed by Gough and Sanford (1952) was found relevant for judging the rigidity in the individual.

One measure of risk taking was located - 'A verbal measure of risk-taking' prepared by N.B. Chaubey (1970). This was applicable to adults in rural context and so could not be used here. The researcher could not obtain any other necessary tool for measuring risk taking.

6.02.3 Adaptation and Modification

Some of the selected tools could be used in the original form itself such as - the intelligence test and the verbal and behavioural reasoning test. The HSPQ and

*1 This was an adapted version of 'Personality Inventory' by Bernreuter (1938).
Rigidity Scale were translated and adapted for the sample of desired age group by the researcher. The adapted versions were given to two expert psychologists. The necessary changes were made on the basis of agreements among them.

The remaining scales - an adapted version of personality inventory, the School Adjustment inventory and the Home Adjustment inventory - were prepared at JPIP. Some modifications were carried out in these scales, after discussing with the expert psychologists.

All these tools were then separately tried out on a small samples ranging from 3 to 15 participants including adults of either sex, boys and girls. This was undertaken to determine -

- the ambiguity in the tool if any,
- the suitability of instructions, and
- the time limit.

The appropriateness of the adapted, modified tools was ascertained; and the handmade scoring keys were prepared with the help of 11 to 13 psychologists. Thus all the tools were ready for the use in Correlational Analysis. The list of tools is given ahead.
6.03 **TOOLS**

The tools used in the present study are tabulated below in Table - VI.1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Nature</th>
<th>Tool</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>General Mental Ability</td>
<td>Standard Progressive Matrices - Raven</td>
<td>Standardized Test</td>
</tr>
<tr>
<td>2.</td>
<td>Verbal Reasoning Ability</td>
<td>A battery of 5 sub-tests based on S-I Model - Guilford, J.P.</td>
<td>Constructed and standardized at JPIP</td>
</tr>
<tr>
<td>3.</td>
<td>Behavioural Reasoning Ability</td>
<td>CBR and CBS : Two sub-tests based on S-I Model - Guilford, J.P.</td>
<td>Constructed and standardized at JPIP</td>
</tr>
<tr>
<td>4.</td>
<td>Personality</td>
<td>Jr. Jr. HRPJ - Cattell &amp; Cattell</td>
<td>Adapted for the present study by the researcher</td>
</tr>
<tr>
<td></td>
<td>Self-Confidence and Sociability</td>
<td>Personality Inventory - Bernreuter</td>
<td>Originally adapted at JPIP, modified for the present study by the researcher</td>
</tr>
<tr>
<td>5.</td>
<td>Rigidity</td>
<td>The Gough-Sanford Rigidity Scale - Gough &amp; Sanford</td>
<td>Adapted for the present study by the researcher</td>
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<tr>
<td>6.</td>
<td>Adjustment</td>
<td>Home Adjustment Inventory, School Adjustment Inventory</td>
<td>Originally adapted at JPIP, modified for the present study by the researcher</td>
</tr>
<tr>
<td>7.</td>
<td>Decision-Making Ability</td>
<td>The Test of Decision-Making Form A and Form B</td>
<td>Constructed for the present study by the researcher</td>
</tr>
</tbody>
</table>
6.04 SAMPLE

Forty nine boys and forty seven girls in the desired age group participated in this study. They attended the same school, belonged to different socio-economic*¹ class and scored average, above average marks in the school subjects.*²

A small sample of four teachers, teaching these students in the school was also approached to obtain the rating in decision-making ability of the sample students.

6.05 HYPOTHESES

A. Decision-making ability would be positively correlated with -
   H1 - High Mental Ability,
   H2 - High Verbal Reasoning Ability, and
   H3 - Behavioural Ability.

B. The good decision-makers would be
   H4 - Emotionally Stable, Confident, Self-sufficient, Tough-minded and Relaxed, and
   H5 - Flexible in their thinking.

C. The good and poor decision-makers will show different profiles.

D. The good decision-makers would be well-adjusted at home and at school.

*¹ This was ascertained through discussions with the Principal of the school.
*² This was based on the students' performance in the tests and examinations held in the school.
6.06 TEST ADMINISTRATION

In all, 15 tests were administered to all the students. A pre-determined order of these tests - exactly the same for all the students - was strictly followed.

The tests were administered by a psychologist and the researcher herself along with two trained supervisors. Sufficient practice of administering the test was given in order to maintain the homogeneity and consistency.

The isolated, airy and properly lighted classrooms were selected for administering the tests. A group of 20 to 25 students was seated in 5 rows specifically, thus each student sitting on a separate bench.

The tests were administered in 2 sessions on two separate days. A small break in between the tests and a small recess in a session was scheduled to diminish the fatigue-effect if any. The plan was so ordered and executed that the chance of leaking out the items or tests, was eliminated.

All the tests had separate answer-sheets, and were timed separately.
6.07 SCORING AND DATA ANALYSIS

The answer-sheets were manually scored with the help of handmade keys with a re-check after every 10th sheet to maintain the reliability.

The performance on Decision-Making Test was scored with the help of ELECTRONICA IBM PC COMPATIBLE computer. The scores related to School (SDM - I, II), Home (HDM - I, II), Entertainment (EDM - I, II) areas and the Total (TDM - I, II) were independently obtained in Form A and Form B.

The individual score of each student was noted.

The normality of each variable was judged after computing the Mean, Median and Standard deviation of all the variables. The data were further analysed to derive the intercorrelations among all the variables and the correlation matrix was obtained. The factor matrix was obtained by the factor analysis with the help of ICL 1904 S computer.

The good and poor decision-makers, identified with the help of Decision-Making Test, were further 'rated' by their teachers on a 5-point scale. 'G' index of agreement between the teachers' ratings and the students' performance on the test was computed and its significance was noted.
6.03 **Observations**

A. Decision Making ability correlated with other abilities

- Mental Ability and Decision-Making Ability

Kleber (1970) had brought to the notice that in the decision behaviour where adequate reasons for the choices are expected, the ability plays more significant role. Contrary to this, Barber (1963) pointed out that mental ability is not a prominent factor in success in decision-making. The obtained results as reflected in the correlation matrix (Table - VI.2) were parallel to the later study. The decision-making ability as measured by the present tool seemed to be correlated very low, though positively with the general mental ability. Only one out of eight correlations was significant at .05 level. Similar results were noted in Chapter - V, which showed that intelligence as defined in the present study was essential for understanding of the problem but not equally so while choosing the correct action. This observation was further supported by factor analysis. All these correlations were so low that they could not yield any factor common to intelligence and decision-making. More details are provided in Table - VI.4.

Thus, the hypothesis (H1) is found to be partially true. The observations with respect to the relation between intelligence and decision-making which were noted at various stages in the present study corroborate with each other.
Verbal Reasoning and Decision-Making ability

As it has been pointed out earlier in Chapter I, problem-solving and decision-making are similar and different at the same time (Adair, 1971). In both the cases, importance is given to the perception of problem, reviewing the factors, setting the alternatives and finally selecting a course of action.

In decision-making, importance is further given to the evaluation of this selected course of action in relation to the aim, feasibility, convenience of implementation, and the risk involved in it.

It was believed that some of the common factors of verbal reasoning would be located in decision-making and problem-solving abilities. The problem-solving model (Guilford, 1971) brought into notice that 'analysis' phase involves cognitive abilities, the 'production' phase entails divergent and convergent production whereas the 'verification' phase contains evaluation. In the present study, the factors measuring cognition, convergent and evaluation operations in the semantic content were included.

These factors need to be explained in brief here. Cognition has been defined as "awareness, immediate discovery or re-discovery, or recognition of information in various forms; comprehension or understanding" (Guilford, 1967, p.203).
This points out how much information the individual can discover from the provided one. In convergent production, one has to arrive at a single solution to the problem with the help of available information; whereas evaluation is applied to the information one has cognized or the information stored in memory. It is defined "as a process of comparing a product of information with known information according to logical criteria, making a decision concerning criterion satisfaction" (Guilford, 1967, p.185).

The semantic content brings the "information in the form of meanings to which words commonly become attached; hence it is most notable in verbal thinking and verbal communication" (Guilford, 1967, p.227).

In order to arrive at a desirable decision, it is necessary to think of all the available alternatives. When a variety of alternatives are suggested, then only one can pay attention towards the desired alternative. Though this is true, in the present study, there was no scope provided for producing a variety of alternatives. Hence, the factors of divergent production were not included, though CM5, NM5, NMI, EMS and EMI were included.

The obtained correlations (Table - VI.2,p.228) indicated that there exists a positive significant correlation among the problem-solving and decision-making
abilities. Thus hypothesis (H2) was confirmed with the help of obtained results, which pointed out that decision-making ability depends on the ability -

- to comprehend the complex ideas (CMS),
- to arrange the available information in the proper sequence (HMI),
- to draw inferences from the directly given information (HMI), and
- to judge the adequacy of inferred information (EMI).

Though the Problem-Solving and Decision-Making abilities were positively related abilities the correlations also revealed that they were not one and the same; but were found to be independent. This was further supported by the factor analysis of the data (Table - VI.4, p.248). Factor analysis ascertained that there exists a factor of 'decision-making ability' and it is different from verbal reasoning. Hence, Decision-Making ability is not merely the problem-solving ability; though there are some common variables influencing both these abilities.

- Behavioural Reasoning

Along with the Verbal Reasoning ability, Behavioural ability - the ability to understand, the behaviour of people in face to face contacts, and the ability of 'empathy' of
'person perception' was felt as an important factor of decision-making ability. While solving the problems related to the social world of an individual, one has to seek information with the help of facial expressions, body movements, gestures, moods, mannerisms of the other person involved.

It was hypothesized that the one who is capable of understanding the relations between persons, between the mental states (CBR), and of locating the temporal sequence of events in which human interactions are the important links (CBS) - would be better decision-makers in social situations.

The data revealed that the ability to understand the relations between persons and the mental states (CBR) has been positively and at times significantly correlated with Decision-Making ability; but there does not exist any relationship between CBS and Decision-Making ability. Thus, only one of the two tests measuring Behavioural Reasoning ability showed correlation with the test of Decision-Making indicating that hypothesis (H3) was partially supported.

B. The personality of good decision-makers

The earlier studies documented, pointed out the controversial findings about the personality of good
decision makers. Barber, (1968) showed that the top group was superior in concentration, curiosity, range of interests, purposiveness and ability to solve practical problems. Carothers (1973) had indicated that personality is related to acquiring and utilizing the information in decision-making process. But contrary to this, Nord (1976) did not find significant differences between undecided and decided students.

Here, in the present study, 13 variables were taken into account in order to reveal the personality differences between good and poor decision-makers. These variables were compared with 8 subscores on Decision-Making test separately. The obtained correlations were useful to point out the good decision-makers (Table - VI.2).

- Positive Correlation of Decision-Making Ability

The Decision-Making ability was positively correlated with the following personality factors -

Emotional Stability

The gathered data revealed that Decision-Making ability has been positively correlated with the emotional stability as all the eight observations are positive, out of which two are significant at .05 level.

As noted in Chapter - I, the theories of decision-making have described a good decision-maker as a rational
man who doesn't get carried away by emotions, can think of what is correct and obtains maximum profits. The results of the present study support the same. The rationality of an individual in different branches is reflected in leading calm, undisturbed life inspite of the external turmoils or deriving maximum gains with the help of deliberate and knowledgeable reasoning, or arriving at the conclusions based on facts and logic. All these approaches point out that the 'rational' man is he who - doesn't get carried away by his emotions, - understands his motives, goals; and produces profits on the basis of facts and logic and not on the desires and passions.

The emotionally stable individual is he who doesn't get irritated by people, is satisfied with his surroundings and possesses a balanced state of mind due to which he doesn't get discouraged even if he fails to achieve the pre-determined objectives.

Adventurousness

Adventurousness as defined by Cattell and Cattell is mainly social boldness. The three significant correlations among the 7 positive, indicated that the good decision-maker would enjoy the crowds, prefer occupations with personal contacts and express his feelings and views openly without any hesitation. He would be bold enough to participate in large parties, open competition and to face the consequences of the situations.
Self-control

Four significant correlations, among the eight positive ones pointed out that the good decision-maker was not only bold, confident to face the situations, emotionally stable enough to accept the surroundings and set the goals, but also sensitive to the ethical standards, social approvals and considerate of others.

As it has been earlier noted that the good decision-maker would try to achieve the 'best possible' was also evidenced here. Here it was implied that the good decision-maker would not think only for himself but also about the others who are with him, and would judge his decision in the context of well-being of all. He would foresee the events and set the ambitions accordingly.

- Negative Correlation of Decision-Making Ability

The Decision-Making ability was negatively correlated with the following personality factors.

Rigidity

Rigidity is reflected in difficulties in thinking analytically. Leach (1970), while critically studying the literature on rigidity pointed out that R.B. Cattell was the first one who labelled the term 'rigidity' to a kind of perceptual behaviour. He tried to study rigidity in a factor analysis study which isolated three factors those were - intelligence factor, perseverative factor and a factor of
inability to learn from gradually changing stimuli. Fisher considered that rigidity serves as a defense mechanism. Else-Frenkel-Brunswik termed rigidity as 'intolerance of ambiguity' and tried to demonstrate it in social relationships and social attitudes. She arrived at the conclusion that 'not only was rigid perceptual behaviour correlated with certain personality traits, but that it was in itself, a manifestation of total personality structure'. Rokeach demonstrated that rigid social thinking was reflected in rigid problem-solving behaviour.

In the present study, rigidity as pointed out in continuing work in an exactly determined order, too much consciousness towards the details and concentrating on only 'one' aspect at a time was not always beneficial for good decision-making. To listen and accept others' views, to take interest in the unusual happenings and to follow activities in a less conventional manner was also essential for successful decision making.

Seven observations negatively correlated with Decision-Making ability out of which two were significant at .05 level clearly indicated that Rigidity in personality was detrimental to decision-making.

Assertiveness

In the present study, Assertiveness was always found to be negatively correlated with Decision-Making and
significantly so at 3 places.

Assertiveness as defined by Cattell is a more general term, based on aggressiveness, competitiveness and dominance as reflected in an authoritarian personality. The negative but low correlations suggest that the good decision-makers need not always be aggressive, competitive and dominant; they might be accommodating and obedient as well.

Beausay (1973) arrived at the observations in line with this. He did not notice any significant difference between the decisions of authoritarian and non-authoritarian people on a series of critical questions.

Worrying

A sense of inferiority and inadequacy in meeting the rough daily demands of life, emotional upsets due to pressures were found as hindrances for effective decision-Making. Along with this, fears, feelings of guilt and inadequacy as well as the fatigue caused by all these were noted as detrimental to good decision-making.

In the earlier studies also, it was pointed out that anxiety in the individuals hindered the performance of problem-solving behaviour (Heuser, 1978). Eysenck (1985) noted that rehearsal and storage of relevant information was impaired due to anxiety.
No definite relationship could be established between the personality of the decision-maker and the characteristics such as sociability, confidence, warm-heartedness, tender-mindedness, excitability, self-sufficiency and tenseness.

In general, it could be said that good and poor decision-makers could be differentiated with the help of their personality traits. Allbritten (1975) had made an attempt to assess the relationship of personal factors and the decision-making ability. The results indicated that indecision and a carefree, unrestrained attitude might be related; secondly low indecision scale score might be indicative of low ego development.

Dean and Garabedian (1931) showed that the tenseness, compulsivity, group dependency, absent-mindedness, sensitivity and emotional stability explained 36% of the variability in subject's increasing level of cognitive rigidity. In the present study also, with the help of obtained results, it could be said that Decision-Making ability was related to some of the personality characteristics significantly. Those were - Emotional Stability, Adventurousness, Self-sentiment or Self-control, Rigidity, Assertiveness and Worry.

Thus, the hypothesis (H4) that the good decision-makers would be emotionally stable, confident, self-sufficient, tough-minded and relaxed - was supported only
in case of emotional stability. The hypothesis (H5) – the
good decision-makers would be flexible in their thinking –
was limitedly supported.

C. The distinction between good and poor decision-makers

Kepner and Tregoe (1965) made efforts to explain the
difference between good and poor decision-makers with the
help of available literature, however, could not arrive at
any conclusions.

Here, the researcher tried to study these differences
with the help of comparison between extreme groups – high
and low on Decision-Making test. These extreme groups were
also rated for decision-making by the teachers. The
personality differences of high and low groups on teachers' 
ratings were also studied.

This study served 2 purposes, firstly – validating
the performance on Decision-Making against the teachers' 
ratings and secondly comparing the personality of a good
decision-maker selected by the test and with that if they
are selected by the teachers.

The researcher selected six students receiving
maximum score and 5 students obtaining minimum scores on
Decision-Making test for this purpose. The names of these
11 students were randomly mixed and presented to four
teachers to obtain their opinions on a 5 point scale. The
ratings given by teachers were averaged and then compared
with the performance on Decision-Making test. This was done for boys and girls separately. Two teachers rated the girls and the remaining two rated the boys—giving in all 22 observations for comparison.

Table – VI.3

The number of students in the 'Extreme' groups

<table>
<thead>
<tr>
<th>Teachers' Rating</th>
<th>Scores on Decision-Making test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td><em>(HH)</em>^1 7</td>
</tr>
<tr>
<td>Low</td>
<td><em>(LH)</em> 5</td>
</tr>
</tbody>
</table>

The obtained data revealed that the scores on Decision-Making test and teachers' ratings tally in 14 cases out of 22, i.e. in 63.64% cases though 'G' Index of agreement (0.27) was not significant. Thus, teachers' ratings and scores on decision-making did not seem to be tallying very highly. Further explorations through a study of these 14 cases clearly brought into notice the distinction between good and poor decision-makers (HH and LL group) on personality traits. The good decision-makers were primarily found as –

* Emotionally More Stable - They were satisfied with the family, and school. They did not get easily annoyed by things and people; and faced no difficulty in remaining quiet and unperturbed.

^1 The codes in the bracket denote the name of the extreme group.
Less Excitable - They were not easily distracted from work by noise or intrinsic difficulty. They did not get hurt or angry when important positions were not given to them.

More Adventurous - They could express themselves freely without difficulty and were continuously in contact with the surrounding events; were bold enough to face open competition and participated in the crowds.

Less Worrying - They did not get emotionally upset by pressures from authority; and did not possess a sense of inferiority. They could meet the rough daily demands of life adequately and had a central feeling of adequacy and belongingness.

Less Rigid - They accepted others' views while solving problems; took interest and enjoyed the unusual situations. They were ready to behave in an unconventional manner. They were less methodical and did not get disturbed when the schedule of work was not maintained and the activities were followed in a different manner.

The good decision-makers were also found to have following characteristics -

Warmheartedness - They preferred occupations dealing with people, enjoyed social recognition and could tolerate difficult people.

Determined - They were used to making decisions for
themselves and had older friends and mature interests.

- Considerate - They thought for others, were foresighted and were concerned with social image. They had ambitions to do well in an approved ethical manner; and lastly

- Obedient - They were less aggressive and more obedient, as compared to poor decision-makers.

The disagreement between the ratings and the obtained data, in 8 cases out of 22, initiated the careful study of scores on personality test of these cases.

The performance of 3 students rated as 'High' in decision-making ability by the teachers but who scored 'Low' on Decision-Making test (HL group), was compared with that of those 5 who were rated as 'Low' but did well on the test (LH group).

The comparison between these groups revealed that the scores of LH group were noticeably higher than that of HL group on Sociability, Warm-heartedness, Confidence, Emotional Stability, Adventurousness and Tender-mindedness. This difference was in the opposite direction when the two groups were compared on Rigidity and Tense-ness. Thus the LH and HH groups were mostly similar on personality traits.

No definite relation could be pointed out between Self-sufficiency and Decision-Making in the correlational
analysis and also while comparing the HL and LH groups. This observation did not support the expectations that a good decision-maker should be self-sufficient. This difference remains unexplained.

What was the ground for high ratings on decision-making given by the teachers to HL group? As the group was very small (N=3), the data could not warrant any conclusion. However, some observations are worth considering.

It was noted that the personality traits of HL group were consistent to some extent with the layman's expectations about a good decision-maker. Generally it is believed that a good decision-maker is thoughtful, rational, logical, less emotional, conscientious and hence he is expected to be more reserved, tense and working alone as he is engrossed in finding a solution to the problem. He is also expected to be more considerate as while selecting a course of action, he will think about his own desires as well as others' feelings and reactions to achieve the best possible in a socially accepted manner. As a good decision-maker is assumed to be aware of his limitations and aspirations, he is bound to be discouraged if he fails to aspire what he wished.

This tendency was reflected here probably due to limited acquaintance among the teachers and students.
There is, therefore, room to say that as the teachers did not know the students well, they might have rated some of them according to the overall behaviour of those students or some of the observable characteristics which they thought belonged to a good decision-maker. These observations suggest more study of the HL group.

D. Adjustments at home and school

Gilmore commented that "the degree to which any person is productive is the degree to which he can master the life situations which confront him. The process of coping therefore entails not only accurate perception and appraisal of the problem, but the capacity to arrive at a decision regarding his own course of action" (Gilmore, 1974, p.229).

Gilmore stressed the stable, conflict-free home providing security and support to the child to grow in a healthy personality. The nutritive atmosphere in the family enables him to draw clear and realistic picture of himself, his capabilities and his environment. It also helps him to develop his social responsibility, to set his aspirations and to safeguard him against the feelings of guilt.

The studies related to decision-making though less in numbers confirmed that the familial warmth (Swanson, 1974), the parents' active role in understanding their children...
(Atherton, 1970) and communication in the family (Ferreira & Winter, 1968 and Bromberg, 1977) were the influencing factors that shaped the decision-making behaviour of children. These studies have been discussed at length in Chapter II.

The results obtained in the present study supported the earlier findings. The three significant observations out of the eight pointed out that Home Adjustment was positively correlated with the Decision-Making ability. No definite relationship could be established between the School Adjustment and the Decision-Making ability.

6.09 FACTOR ANALYSIS

In order to identify the nature of decision-making ability, many variables were selected on the basis of reviewed literature, interviews of teachers and youth leaders who worked as resource persons and the judgements of the researcher. It was essential to note how these variables influence decision-making ability and their significance in determining it. Hence, factor analysis was an essential step in the present study.

R.B. Cattell has pointed out that, "Particularly in the biological and social sciences the researcher is presented with so bewildering a multitude of possible variables that unless he first factorizes to find the
inherent organization or structure, i.e. to find which surface variables are representatives of more significant, less numerous underlying variables, an immense waste of effort could take place ...... Factor analysis, however, comes to our rescue as a kind of radar to avoid both the trivial and the unreal, for it gives us - however roughly at first - the shape of the real structures hidden in the swirling multiplicity of variables" (Cattell, 1952, p.16).

Thus, with the help of factor analysis, one can discover the significantly operating variables of the structure of behaviour to be studied.

In other words, "Factor analysis is a refined technique for analyzing the interrelationships of behaviour data" (Anastasi, 1968, p.116).

Thus, if a number of tests measuring different variables have been administered to different persons, in the process of factor analysis, these large number of variables are reduced to a relatively small number of factors or common traits. In this way, the concerned behaviour could be explained with the limited number of variables. Secondly, factor analysis also helps to describe the exact nature of the ability under measurement as the nature of a factor can be explained by the nature of the test loaded on it.
### Table VI.1: Rotated Factor Matrix

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<th>Variable No.</th>
<th>Factor Numbers</th>
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<td>1.</td>
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<td>1.</td>
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<td>11.</td>
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<td>12.</td>
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<td>24.</td>
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<td>26.</td>
<td>.54</td>
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<td>27.</td>
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<td>28.</td>
<td>.81</td>
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<tr>
<td>29.</td>
<td>.66</td>
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<tr>
<td>30.</td>
<td>.78</td>
</tr>
<tr>
<td>31.</td>
<td>.97</td>
</tr>
</tbody>
</table>

1. SPM  
2. CBR  
3. CBS  
4. CNS  
5. NMN  
6. NMH  
7. EMS  
8. EMI  
9. Home Adjustment  
10. School Adjustment  
11. Rigidity  
12. Sociability  
13. Confidence  
14. Warm-heartedness  
15. Emotional Stability  
16. Excitability  
17. Assertiveness  
18. Adventurousness  
19. Tender-mindedness  
20. Worrying  
21. Self-sufficiency  
22. Self-control  
23. Tensionness  
24. SDM I  
25. HDM I  
26. ELM I  
27. TDM I  
28. SDM II  
29. HDM II  
30. ELM II  
31. TDM II
The Diagonal Method, the Centroid Method and the Principal Component Method - are the methods suggested for factor analysis. All these methods begin with the correlation matrix - a table consisting the correlations of each variable with every other variable; and end with a factor matrix - a table providing us with the loading of each variable in the factor.

For the present study, the factor analysis was done with the help of computerized programme of the Principal Component Method. Principal components were extracted from the 31 X 31 correlation matrix. Eight factors accounting for 61.67 percent of the total variance were derived; further extractions were not meaningful. The factor loadings were considered as satisfactory when above .35 and as weak when between .20 and .35. The factor matrix is presented in Table - VI.4, further each factor with a few selected variables having satisfactory loading is presented at proper places.

The nature of the tests loaded on the first factor - Factor 'A' (Table VI.5) together produced the description of the factor that this ability consisted of -

- accurate perception of the problem,
- perception of available information and proper use of it,
- tendency to face the situation,
- selection of appropriate alternative or course of action,
- awareness of implications of various alternatives, and
- taking risk wherever required.

Table - VI.5

<table>
<thead>
<tr>
<th>Tests</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDM II</td>
<td>.97</td>
</tr>
<tr>
<td>SDM II</td>
<td>.81</td>
</tr>
<tr>
<td>EDM II</td>
<td>.78</td>
</tr>
<tr>
<td>HDM II</td>
<td>.66</td>
</tr>
<tr>
<td>TDM I</td>
<td>.59</td>
</tr>
<tr>
<td>EDM I</td>
<td>.54</td>
</tr>
<tr>
<td>SDM I</td>
<td>.38</td>
</tr>
<tr>
<td>CMS</td>
<td>.32</td>
</tr>
<tr>
<td>CBS</td>
<td>.25</td>
</tr>
<tr>
<td>EMS</td>
<td>.22</td>
</tr>
</tbody>
</table>

Along with this, Factor 'A' which can be named as 'Decision-Making' was also loaded on CBS (.25)\(^1\), CMS (.32) and EMS (.22) . These weak loadings revealed that this factor of Decision Making was also determined to some extent by the psychological information of humanbeing like emotions

\*1 The numbers in the bracket denote the factor loadings.
and moods expressed in social situations and the understanding and evaluation of the verbally meaningful situations.

This factor alone explained 18.84% of the variance.

The second factor - Factor 'B' seemed to be a major factor, independently measuring 11% of the variance. This factor was loaded with some of the personality variables along with the individual's adjustment at Home (Table - VI.6).

Table - VI.6

<table>
<thead>
<tr>
<th>Tests</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Stability</td>
<td>.80</td>
</tr>
<tr>
<td>Tensionness</td>
<td>.77</td>
</tr>
<tr>
<td>Adventurousness</td>
<td>.65</td>
</tr>
<tr>
<td>Excitability</td>
<td>.65</td>
</tr>
<tr>
<td>Home Adjustment</td>
<td>.57</td>
</tr>
<tr>
<td>Warmheartedness</td>
<td>.54</td>
</tr>
<tr>
<td>Worrying</td>
<td>.43</td>
</tr>
<tr>
<td>Rigidity</td>
<td>.27</td>
</tr>
<tr>
<td>EMI</td>
<td>.20</td>
</tr>
</tbody>
</table>

This second factor can be named as 'Emotional Maturity and Adjustment' containing 9 variables, some positively and others negatively correlated as seen in the
Correlation Matrix (Table - VI.2). The results pointed out that though Decision-Making ability was correlated with Emotional Maturity and Adjustment, the latter stood as an independent dimension of the personality of a good decision-maker. Thus, though Emotional Maturity facilitated good decision-making, it was not a part and parcel of Decision-Making ability.

Here, the role of rigidity in personality, and ability to evaluate semantic information, though was not significant, could not be overlooked.

The third factor - Factor 'C' emerged out as Evaluative Semantic Thinking and Self-control (Table - VI.7).

**TABLE - VI.7**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Control</td>
<td>.69</td>
</tr>
<tr>
<td>EMI</td>
<td>.65</td>
</tr>
<tr>
<td>EMS</td>
<td>.48</td>
</tr>
<tr>
<td>CMS</td>
<td>.39</td>
</tr>
<tr>
<td>Tender-mindedness</td>
<td>.23</td>
</tr>
<tr>
<td>NMI</td>
<td>.19</td>
</tr>
</tbody>
</table>

Factor 'C' independently explaining 6.99% variance pointed out that the ability to comprehend and evaluate the
semantic information, ambition to do well, concern with
tone's social image, concern for others, foresightedness and
conscience form one factor. The results supported previous
research and the observations noted at earlier places in the
present study that Evaluative Semantic Thinking which forms
a part of problem solving is essential for decision-making
but is an independent ability.

Factor 'D' was reflected in the Reasoning based on
Behavioural and Semantic Information.

**Table - VI.8**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBR</td>
<td>.79</td>
</tr>
<tr>
<td>NMI</td>
<td>.65</td>
</tr>
<tr>
<td>NMS</td>
<td>.52</td>
</tr>
<tr>
<td>CBS</td>
<td>.47</td>
</tr>
<tr>
<td>Sociability</td>
<td>.32</td>
</tr>
<tr>
<td>Rigidity</td>
<td>.31</td>
</tr>
<tr>
<td>HDM II</td>
<td>.28</td>
</tr>
<tr>
<td>CBS</td>
<td>.25</td>
</tr>
</tbody>
</table>

Factor - D independently explaining 6.12% of the
variance could be named as Reasoning based on Behavioural
and Semantic Information. The results indicated that this
ability showed its existence independent of Decision-Making ability, though it helps the latter. As noted previously Reasoning forms a part of problem-solving but it does not play the same role in decision-making. The weak loadings of personality factors - Sociability (.32) and Rigidity (.31) indicated that these two variables did not affect significantly though they could not be ignored either.

The fifth Factor 'E' again emerged as a Personality factor which consisted of three variables obtained earlier in Factor 'B', and two more. They were Assertiveness (.69) and Sociability (.54).

### Table VI,9

<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assertiveness</td>
<td>.69</td>
</tr>
<tr>
<td>Sociability</td>
<td>.54</td>
</tr>
<tr>
<td>Warmheartedness</td>
<td>.35</td>
</tr>
<tr>
<td>Home Adjustment</td>
<td>.35</td>
</tr>
<tr>
<td>Excitability</td>
<td>.34</td>
</tr>
<tr>
<td>Worrying</td>
<td>.30</td>
</tr>
<tr>
<td>NMI</td>
<td>.24</td>
</tr>
<tr>
<td>Self Sufficiency</td>
<td>.24</td>
</tr>
<tr>
<td>Intelligence</td>
<td>.23</td>
</tr>
</tbody>
</table>
The weakly loaded variables - Self-sufficiency, NMI and Intelligence indicated their role though, not very significantly.

The first five factors - 'A' to 'E' - together could explain 48.35% of the variance; whereas factor six, seven and eight could explain 13.33% of variance.

Factor 'F' the sixth one, came up once again distinctly as a factor of Decision-Making, loaded by a few variables of decision-making test - SDM I(.90), HDM II(.64) and very weakly loaded by certain personality variables - Rigidity(.27), Worrying (.19) and Behavioural Understanding - CBS(.16).

The seventh Factor 'G' consisted of some strongly loaded variables of decision-making such as HDM I(.66), EDM I(.58) and TDM I(.59). It also consisted of a few weakly loaded personality variables like—

Warmheartedness - (.28), Assertiveness - (.20), Adventurousness - (.20), Excitability - (.16), Worrying - (.15) and Self Control - (.15) along with some strongly or weakly loaded variables of reasoning like CBS - (.54) and NMS - (.17).

Thus, the seventh order factor came in a mixed form of Decision-Making ability, Personality and Reasoning. The eighth one was the combination of Personality and Adjustment. This factor contained the strongly loaded variables like School Adjustment (.78), Self-sufficiency (.78)
and the weakly loaded variables such as Rigidity (.44), Home adjustment (.34), Sociability (.30) and Tender-mindedness (.27). Thus, 8 factors could be extracted. They are again given below —

Table - VI.10

The 'Percent Variance' explained by the factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Name of the factor</th>
<th>Percent variance explained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Independently</td>
</tr>
<tr>
<td>A</td>
<td>Decision-Making</td>
<td>18.84</td>
</tr>
<tr>
<td>B</td>
<td>Emotional Maturity and Adjustment</td>
<td>11.45</td>
</tr>
<tr>
<td>C</td>
<td>Evaluative Semantic Thinking</td>
<td>6.99</td>
</tr>
<tr>
<td>D</td>
<td>Reasoning based on Behavioural and Semantic Information</td>
<td>6.12</td>
</tr>
<tr>
<td>E</td>
<td>Personality</td>
<td>4.95</td>
</tr>
<tr>
<td>F</td>
<td>Decision-Making, Personality and Behavioural Reasoning</td>
<td>4.78</td>
</tr>
<tr>
<td>G</td>
<td>Decision-Making, Personality and Reasoning</td>
<td>4.52</td>
</tr>
<tr>
<td>H</td>
<td>Personality, Reasoning and School Adjustment</td>
<td>4.03</td>
</tr>
</tbody>
</table>

In brief, the analysis yielded two major factors i.e. Decision-Making Ability and Emotional Maturity and Adjustment.
The third and the fourth factors belonged to Problem Solving. The fifth one emerged as a factor of Personality along with some cognitive variables but not with decision-making; and the sixth and the seventh factors came up as Decision-Making along with Reasoning and Personality. Thus, though decision-making and some personality traits showed high correlation, the two dimensions remained independent explaining the major portion of variance. However, their association was reflected at a later stage when they arrived together in factor matrix as the 6th and 7th order factors.

Similarly, Decision-Making and some factors of problem solving i.e. Evaluative Thinking and Reasoning though highly correlated were independent abilities. This was proved in the obtained results — as the first major factor extracted contained the factor of Decision-Making ability alone. If they both would have been one and the same, the tests of Verbal Reasoning would have obtained the similar high loading in the first factor — 'A'. — Whereas the 3rd and 4th factors have been extracted as factors of Evaluative Semantic Thinking and Reasoning successively. Hence, the two abilities are independent though they show some association.

Thus for identifying decision-making ability a test of Decision-Making seems to be sufficient. Some of the variables of personality and reasoning come in the picture only at the later stage which suggest the importance of their role though marginal.
6.10 **SUMMARY**

In order to identify the nature of decision-making ability variables that could be related with it were enlisted. The available tools measuring those variables were surveyed; and the selected tools were adapted or modified for the present purpose.

In all, 15 tests were administered to 49 boys and 47 girls in the desired age group in the strictly followed pre-determined order. The teachers' ratings about the decision-making ability of extreme group children were collected.

Decision-Making ability was positively correlated with Emotional Stability, Adventurousness and High Strength of Self-Sentiment; whereas it was negatively correlated with Rigidity, Assertiveness and Worrying nature.

The good and poor decision-makers as identified by the test score and the teachers' ratings given to them tallied in 63.64% of cases.

The factor analysis was carried out with the help of computerized programme of the Principal Component Method. First eight factors were extracted that explained 61.67% of the variance; though in all 10 factors were derived that accounted for the 63.81% of the total variance.
Factor analysis also clearly brought to notice that Decision-Making ability and Verbal Reasoning ability though correlate highly are independent of each other. Hence, for the selection of good decision-makers from the individuals standing above a specified cut-off-point, one may use relevant variables of personality and reasoning. For high level screening a single score on Decision-Making test might not be sufficient.