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CHAPTER II

REVIEW OF LITERATURE

2.01 INTRODUCTION

Everyone has to face the problems, understand them and solve them to cope up with the environment. Hence everybody - the rich or the poor, the adult or the young child, the manager or the worker - has to face the problems. The nature, the severity and the duration vary according to the decision-maker but everybody has to try to make the judgements about his surroundings and try hard to gain the maximum benefits.

Of course, this is not an easy job. It requires certain amount of capacity, understanding and efforts which would culminate into better results. People vary widely in these characteristics and so naturally derive different amount of returns from life.

It was therefore, quite natural that individuals from different fields showed their interest in the study of decision-making. This is reflected in the studies done so far. A wide variety of studies are documented here.
2.02 DECISION-MAKING IN DIFFERENT FIELDS

Studies have been conducted pertaining to the decision-making in a variety of fields such as educational, domestic, consumer, politics, medical and criminal; though it has earned more popularity in the field of management.

Decision-making in couples - a comparison of a self-report and behavioural measure of power (Olson, 1963); the effect of husband-wife communication on marital power in decision-making (Weeks, 1973); housing decisions in selecting a residence in a planned townhouse development (Gallooly, 1974); decision-making among marital couples (Murphy, 1976); communication analysis of family decision-making in normal and reading problem families (Peck, 1971) are a few studies undertaken in domestic field.

Potter (1979) has surveyed factors such as ease of public transport, variety of shops, social roles of shopping centres, and the influence of advertising on consumer decision-making. The effect of prior knowledge, experience and phase of the choice process were studied by Bettman and Park (1980). A comparison of decision-making by housewives in two social classes was made by Fry and Siller (1970).
Grinspoon (1969) brought to the notice that though institutions take impressive steps to safeguard the physical health of decision-makers such as executives, they tend to exclude provision for interpersonal needs.

Klein and Mahar (1970) found the autonomy in decision-making directly related to the perceptions of conflict. The practical difficulties in practising the theory of participative management were pointed out by Wadia (1980), whereas Ungson, Braunstein and Hall (1981) studied the suitability and appropriateness of theories of decision-making behaviour in organisations. Agarwal and Gupta (1982) suggested a technique—Multiple Discriminative Analysis—to solve the problems in today's atmosphere of business activity.

Quantitative analysis of judicial decision behaviour (Nash, 1971); similarity of judge and violator in professional decision-making (Weiss, 1974); decision rules, attitude similarity and jury decision-making (Bray, 1975) were studied in the field of crime whereas factors in educational decisions among public school pupils (Dole, 1969); factors in students' decision to attempt academic tasks (Gray, 1972) and factors related to the decision of men and women to continue taking science courses in college (DeBoer, 1984) were studied in educational field.
2.03 FACTORS RELATED TO THE DECISION-MAKER

2.03.1 Cognitive Factors

A. Ability

No agreement has been established pertaining to the role of ability of the decision-maker. According to some, intelligence plays an important role. Kleber (1970) tested the dependency of decision-behaviour on ability with the help of 11 year old male pupils of normal and below normal ability. According to him, ability more than age proves to be an essential, independent variable in decision behaviour to give adequate reasons for the choices. But Barber (1963) while studying decision-making and level of intelligence concluded that if mental ability plays a part in success in decision-making, it is not a prominent factor.

Schvaneveldt and Adams (1993) comment that skill in decision-making is developed as one matures and is actively involved in society. Competent decision-making implies persistent openness to situations that help to maximise refinement of the necessary techniques.

Weinman, Elithorn and Cooper (1985) indicated that the overall speed is more closely related to the intellectual ability scores than to personality. These findings were related to perceptual problem-solving tasks.
B Intuition

Efforts were made to seek empirical evidence regarding intuition and decision-making with the help of undergraduate business students (Cosier and Aplin, 1982). Subjects in the highly intuitive group performed better than did other subjects - indicating that some individuals may have unique intuitive abilities that may assist in decision-making.

Agor (1985) noted that the upper level managers possessed higher ability to use intuition in decision-making than the middle or lower level managers. Also females had better intuitive capacity than males.

2.03.2 Non-cognitive Factors

A. Personality

The studies on the role of personality in decision-making have resulted into controversial findings. Lucie (1968) revealed that there was significant difference between the top and the bottom half of the sample of teen-age delegates regarding success in decision-making skills. The top group was superior in concentration, curiosity, range of interests, purposiveness and ability to solve
practical problems. Further she also tried to obtain the correlation of personality traits with success in scientific decision-making (1968a). Mathematical ability, practical problem solving, rote memory, concentration, range of interests, curiosity, good imagination, maturity and purposiveness were significantly related to success in scientific decision-making. Interest in school and study habits were also positively related. It was concluded that successful decision-makers were eager to learn.

The role of personality in information acquisition and utilization during the decision-making process indicated that personality was related to decision performance (Carothers, 1973). Here Minnesota Multiphasic Personality Inventory, Gordon Personal Inventory and Gordon Personal Profile were used.

Jones and Melcher (1982) tried to relate the eleven personality variables to the preference for mode of conflict resolution - smoothing, forcing and confronting. Positive correlations were found between smoothing mode and affiliation, succourance, nurturance variables of personality. Forcing mode was related to deference; confronting mode of dogmatism and machiavellianism
personality. Negative correlations were obtained between affiliation forcing and machiavellianism - smoothing.

The findings in contrast to these were gathered by Nord (1976). He wanted to determine the personality differences between undecided and decided students; and used Myers - Briggs Type Indicator and Holland's Self-Directed Search for that purpose. No significant differences were found on either of the tools.

To assess the relationship of selected personal factors to decision-making ability, a study was undertaken by Allbritten in 1975. The Indecision scale, developed by Holland and Nicholas was selected as a measurement device to assess each subject's ability to make decisions. Seven scales were selected from the Sixteen Personality Factors Questionnaire to assess personality correlates with the Indecision Scale. An inverse relationship suggested between scale 'C' and the criterion implied that a low indecision scale score might be indicative of low ego-development. Also indecision and a carefree, unrestrained attitude might be related. The more restrained individual might possess less potential for making decisions.

In the studies mentioned above, the total personality make-up was taken into account whereas in the other studies some of the characteristics of personality were studied singly.
B. Anxiety

In general, the experiments on anxiety showed that 'anxiety' in the individuals hindered the performance of problem solving behaviour. Highly anxious subjects showed significantly higher deterioration in problem-solving behaviour than the less anxious subjects in the same situation (Heuser, 1979). The disorganising effect of stress on problem solving was interpreted as being due to the shift in attention of the sample. The performance of individuals high and low in anxiety trait was compared on a cognitive task involving letter transformation (Eysenck, 1985).

Adverse effects of anxiety on performance were noted only on the complex tasks. He indicated that anxiety impaired the rehearsal and storage of task-relevant information that resulted into a poorer performance.

Lyon (1977) made an attempt to determine if anxiety levels would be significantly affected by the amount of time to decide and the number of alternatives. He formulated the hypotheses and the results failed to support the hypotheses. In a situation involving possible negative outcomes, the anxiety level was significantly higher when the time to make a decision was restricted and the number of alternatives increased.
The reaction time for semantic and non-semantic decisions were experimented by Mueller and Wherry (1932). It was felt that high anxiety subjects would show a more marked decrement in reaction time than the low-anxiety subjects, though they did not get the consistent support to this hypothesis.

C. Authoritativness

Beausay (1973) while studying decision-making as a function of authoritarian personality did not notice any significant difference between the decisions of authoritarian and non-authoritarian people on a series of critical questions.

D. Confidence

The studies related to confidence showed that familiarity with the task, amount of information, affective aspects of stimulus, amount and strength of the evidence to support the selected alternative strongly affected the confidence of the decision-maker.

Familiarity with the task (Heslin and Streufert, 1968) increased the confidence of decision-maker to rely
on the environment and structure it while taking the decisions. Landis, Slivka and Silver (1969) investigated the relationship between certitude and decision-adequacy using a complex problem-solving task. The correlation between decision-adequacy and certitude was found very low. Certitude was closely related to affective aspects of stimulus and to the level of cognitive and perceptual scanning employed by subject. The confidence measure was significantly affected by the response-uncertainty and amount of information in a complex decision task (Hoge, 1970) and by the amount and strength of the evidence supporting the answer chosen (Koriat, Lichtenstein and Fischhoff, 1990). Field dependent subjects were significantly more confident in their decisions than field independent subjects (Gul and Zaid, 1981).

E. Depressiveness

The depressed people were found to be more conservative decision-makers and appeared to take a more negative view of the future as compared to the non-depressives. The non-depressives were willing to accept much less satisfaction for a risky choice (Costello, 1983).
F. Dogmatism

Varis (1974) investigated the relationship between dogmatism, congruency, physiological activity and negative feedback during simulated decision-making. He pointed out that there is no significant relationship between level of dogmatism and congruency of choice, though under simulated conditions, negative feedback had an effect on congruency of choice. Physiological activity measures are not predictors of participant's congruency of choice.

Cox and Luhrs (1981) found that formal reasoning and open-mindedness develop independently as separate entities or as different components of the same entity.

More highly dogmatic managers—demonstrated an upward change in confidence in a 'personnel lay-off' decision when provided with new human resources accounting information than did less dogmatic subjects (Gul, 1983).

G. Extraversion

No clear cut relationship between extraversion and behaviour in decision-making was noted. Extraversion did correlate with factors such as importance of decision, confidence in the decision, and the strength of conflict.
The correlations were sometimes positive and sometimes negative (Westhoff, 1978). At the same time a consistent, negative linear relationship was found between reaction time and extraversion. In another study by Weinman, Elithorn and Cooper (1935), extraversion appeared to be more important in determining the relative amount of time spent on certain phases of maze-solving, particularly the initial period of scanning prior to making a response.

H. Obsessiveness

In an exploratory investigation Milner, Beech and Walker (1971) found that obsessionals made a significantly higher demand for repeated trials whereas Reed (1976) concluded that it is not so much decisions that are problematic for obsessionals as it is decisions about decisions. He proposed that obsessionals-compulsive problems arise from a central cognitive feature involving impairment in the spontaneous organization and integration of experience. Decisional problems of obsessionals are manifestations of their attempts to impose exaggerated structure of experiences, leading to an overdefinition of conceptual categories and temporal boundaries. The amount of difficulty experienced is directly related to the perceived structure of the situation as well as its personal importance.
I. Reflectiveness Vs. Impulsiveness

The researchers agree unanimously that reflective subjects take longer time to make the decisions than the impulsive subjects (Reali and Hall, 1970; Leon, 1973; Malloy, 1976; Sato, 1983) though there are hardly any differences in the quality and content of decision-making (Reali and Hall, 1970; Leon, 1973).

Malloy (1976) pointed out that impulsives differ from non-impulsives in anxiety arousal also. This study also supported Kipnis' (1971) findings that impulsives become anxious over fewer objects and situations than non-impulsives. Both men and women, when non-impulsive tend to become anxious while making a decision; and both male and female impulsives tend to escape this anxiety.

Impulsive boys took more risks than impulsive girls and reflective subjects of either sex (Sato, 1983). The findings suggest that there may be cognitive style differences in the standard of response accuracy that would be used to select response strategies, so that impulsive children might underestimate task difficulty due to low criteria for accuracy.
J. Rigidity

Rigidity as reflected in the resistance to change of beliefs and difficulties in solving problem, was felt as an important factor affecting decision-making. The rigidity was also noticed to influence the analytical thinking.

Rigidity was not significantly related to social, emotional, health or home areas of adjustment. A negative correlation was found between rigidity and the finance area of adjustment (Singh, 1982). Dean and Garabedian (1981) investigated the personality characteristics associated with a learner's cognitive rigidity. Results showed a highly reliable multiple relationship between rigidity scores and scores on 16 PF. Tension, compulsivity, group dependency, absent-mindedness, sensitivity and emotional stability explained 36% of the variability in subject's increasing level of cognitive rigidity.

Goldsmith (1972) investigated the relationship between proneness to behavioural stereotype, measured in a problem-solving task and decision-making behaviour. Subjects more stereotyped in a problem-solving task tended
to be more stereotyped in their decision-making behaviour. Stereotyping was not related to extraversion, neuroticism, rigidity or overall problem solving performance but more often required excessive number of trials for task solution. Also the decision-making of males tended to be more stereotyped.

2.03.3 Social, Environmental Factors

A. Environment

Kozielecki (1974) from Poland presented an empirical evidence in support of the contention that environmental factors weigh much heavier in decision processes than personality factors.

B. Expectations

McDaniel (1970) explored the relationship between expectations and desires, its influence on decision-making, and the demographic, temporal and behavioural factors in decision-orientations. He concluded that some people act mainly on what they expect, others on what they desire, still others on what they would like to prevent - resulting in different decisions.
C. Family

The influence of family atmosphere was recorded significantly. In general, familial warmth, parent's active role in understanding their children and using their knowledge to shape the child's personality and communication in the family were the influencing factors.

Ferreira and Winter (1968) compared the normal and abnormal families. Statistically significant differences were found, with normal families having higher spontaneous agreement, shorter decision time and greater choice fulfillment. The abnormal families lacked in shared emotional experiences and had greater communicative inefficiency.

Utech and Hoving (1969) evaluated the relative social influence of parents and peers in ten social situations in children. The overall level of conformity to either adults or peers increased across age whereas the proportion of conformity to parents as opposed to peers significantly decreased across age.

The progress of a boy and a girl from Kindergarten through senior high school with particular attention to
decision-making, motivating forces and physical conditions or social pressures in the child's environment was recorded. It was pointed out that if parents in general recognized uniqueness, the greater help was given to the children in personality development (Atherton, 1970). Along with this, the importance of familial warmth was also stressed (Swanson, 1974).

Bromberg (1977) while studying the family dominance patterns and the decision-making process in obese and non-obese families indicated that the decisions of non-obese families were more unanimous and less chaotic. They also tended to have more spontaneous agreements and had more choice fulfillments. Similarly non-obese adolescents played a more active role in decision-making process of their families as compared to obese adolescents.

The influence of others and the decision to participate in youth sports was studied by McGuire and Cook (1983) with the help of 10-13 years old participants in youth-sport. Those, whose choice to participate in youth sports was perceived as totally their own were less likely to consider quitting the sport and more likely to report
high self ratings of skill and ability than those whose choice to participate was perceived as being greatly influenced by others.

The cultural difference of socialization and family decision-making was recorded by Poole, Sundberg and Tyler (1982). Among Indian, American and Australian adolescents, Americans indicated the greatest amount of autonomy, and the higher influence in family decision-making whereas the Indian subjects indicated the least. The influence of fathers and others outside the family was greatest in India.

Belch, Belch and Ceresino (1985) tried to determine the influence of parents and the child on family decision-making. They studied three stages of decision process. Those were - initiation, search and evaluation and the final decision. The decision-making in six areas - e.g. purchase of T.V. set, vacation etc. pointed out that the influence of each family member varied with reference to the area and the stage of decision-making.

D. Responsibility

McDonnell (1974) while studying the human elements in decision-making considered the decision maker as acting
subjectively on the basis of his own standards, his sense of obligation to his superiors etc. etc.

E. Values

Barber and Atherton (1968) introduced the concept of using the religious convictions as catalysers in decision-making. Those subjects who could comprehend the concept were more mature and to a greater extent used lay-scientist methods for evaluation.

The effect of ethical values on decision-making was also supported by Hems (1971) who concluded that moral consciousness most clearly characterizes man and distinguishes him from others. Alker, Rao and Hughes (1972) demonstrated that the manner in which decisions are made affects the degree to which an individual's values are expressed in those decisions.

To study the relationships among decision-making, values clarification and the self-concept, a course of study was offered to high school seniors (Graham, 1976). The results showed that the students who actively participated in a program that focussed on a process of decision-making based on values clarification, made
future choices that reflected a statistically significant improvement in self-concept.

Heath (1976) presented a view that the values influence the individual's effort to define and evaluate situations for choosing and behaving.

Zhukov (1980) took a sociological approach to the problem of values as determinants in decision-making. He analyzed that the concretization of the values of society depends on the individual personality in the social system and on its developmental level. Thus the impact of individual personality influencing group activity and group interaction were pointed out.

2.03.4 Other Factors

A. Age

The time required to arrive at a decision, the quality of the decision, the tendency to face or avoid the decision were influenced by the age of the decision-maker.

Spencer, Williams and Oldfield (1974) tested the assertions in the literature that the elderly persons are less willing to make decisions involving risk than are the
young ones. But, they did not observe such difference between the old and young sample in their study. Calhoun and Hutchison (1981) while examining the decision-making in old age revealed that given the opportunity to avoid making decisions, subjects did so even under no risk conditions. Subjects become more conservative and cautious in their decisions when the outcome was directed at the lives of young rather than old individuals. Rigidity was also found to be related to subject's risky decisions. In both the studies, the Choice - Dilemma - Questionnaire was presented to the subjects to make their decisions.

In case of industrial line managers, age influenced decision-making performance more than did prior decision-making experience (Taylor, 1975). Along with age, education and income, the satisfaction with decisions made was the significant variable that resulted into a positive approach towards life (Guttman, 1978). Though, Taylor, Adelman and Kaser-Boyd (1984) indicated that children should take part in decisions related to everyday activity at an earlier age.

B. Drugs

Complicated cognitive and psychological effects of the drugs like alcohol, minor tranquilizers, caffeine,
marihuana, major stimulants and opiates were studied in the past (Lubit and Russett, 1984). Various psychoactive drugs were also shown to affect social interaction and decision-making in a group.

C. Humour

Donald and Carlisle (1983) presented eighteen decision-making roles which provided a humorous way for students to identify problems pertaining to autonomy, responsibility, risk-taking, self-confidence, flexibility and knowledge about self or environment in their decision-making. The use of humour provided a new perspective on such problems and allowed freer discussion of ways to overcome them.

D. Sex

Females made suggestions for solutions to problems as frequently as males during the decision-making process (Hurwitz, 1977), showed comparable value patterns to that of males (Palmer, 1983) and performed like males on the decision task variable (Muldrow and Bayton, 1979), though however, they differed from males in many aspects.
Female executives were less prone to risk-taking than males (Muldrow and Bayton, 1979). Males selected more risky bets than females (Cvetkovich, 1972). They initiated more verbal acts than women, and held positions as the most influential group member than women. They initiated a larger proportion of their remarks in the 'performance outputs' category while women initiated a larger proportion of their acts in the 'positive reactions' (Hall, 1973).

Cvetkovich (1975) compared the riskiness of decisions made for self and for another person. He revealed that when the self and the other person were of the same sex, no significant difference was found between the bets selected for self and other, for mixed sex pairs, both males and females selected more risky bets for others than for self.

Females were less strongly oriented towards economic, political and theoretical values and more strongly oriented towards social, aesthetic and religious values. In the simulated managerial decision-making situation, females were more willing to support efforts to improve personnel selection, development and counselling and less willing to support new research and development projects (Palmer, 1983).
E. Transcendental Meditation

Transcendental meditation has been found to lower anxiety, improve attention and the discriminative capacity related to decision-making, foster more resistance to environmental stress and more efficient nervous system activity and enhance learning efficiency and job adjustment (Kuna, 1975).

2.04 FACTORS INVOLVED IN THE PROCESS OF DECISION-MAKING

2.04.1 Alternatives

AttrIBUTION of choice to a decision-maker, preference for consonant information in reversible and irreversible decisions and prediction of random and non-random events were the factors studied with reference to the alternatives (Frey, 1981).

A theoretical model to predict the amount of 'real choice' attributed to a decision maker was generated (Steiner, Rotermund and Talaber, 1974). The model maintained that greatest choice is attributed when available options seem equally attractive. The conclusions based on the experiments revealed that this model tells the truth but not the whole truth about the attribution of choice.
When decisions were irreversible, the relative preference for consonant information increased with the similarity in attractiveness of the decision alternatives. When decisions were reversible, the relative preference for consonant information decreased with the similarity in attractiveness of the alternatives (Frey, 1981).

Teigen (1933) examined the guessing patterns of a random event, where all alternatives are equally probable like in lotteries. He noted that subjects tend to choose central 'representative' values and avoid extreme ones. In continuation with this, he also studied (1933a) the prediction of non-random events in which outcomes had an unequal probability of occurring. He noticed that if the probable outcome was an extreme one of 'unrepresentative' value, subjects did not always predict it. They preferred to be consistent rather than being rational while making the final prediction.

2.04.2 Information

Denner (1968) pointed out that the individuals who needed relatively more information for decision-making and were concerned with the difference between real and unreal,
tended to take longer reaction time, hesitated and paused more frequently, were more evasive and less concrete.

The manner in which the information was presented and the subject's prior history of success or failure on a similar task, influenced significantly the subject's sensitivity to incoming information (Gibson and Nicol, 1970).

Landis, Slivka and Silver (1970) studied the effect of visual irrelevancy on complex decision-making and indicated that irrelevancy was facilitative for decision-making. The mere random irrelevancy resulted into more adequate solution.

A rough distinction was attempted between outer-situational and inner-personality specific determinants (Freier and Schmidt, 1973). The variables of uncertainty, importance, semantics and cognitive as well as non-cognitive personality were examined to determine their influence on information acquisition behaviour and the influence of stress and social situation was noted.

Simple decision-making appeared to be affected by information load - the quantity of incoming information
per unit time; whereas complex decision-making appeared to be affected by relevant load - the quantity of specifically relevant information reaching decision-makers (Streufert, 1973).

An interesting experiment (Sniezek, 1930) indicated that although judges have adequate knowledge about the behaviour of events in the past, they do not correctly and consistently apply this knowledge in making decisions about future events.

The integration of information in decision-making was the topic of interest to Shaw (1932). He rejected the idea that one integrates the relevant information from several sources prior to making a decision and pointed out that one seems to form separate decisions about the information from each source and then integrates those decisions to select a response.

2.04.3 Profit and Loss

Dixit and Singh (1975) pointed out the significant interaction between the expectancy that reinforcement is contingent on one's own behaviour and the expectancy that reinforcement is determined by luck, chance, fate or powerful others.
The experiments by Christensen and Jay (1978) showed that as the benefits of making a correct decision increased, problem-solvers took more time to reach a solution and were more confident in their answers. St. Jean Richard (1979) revealed that the loss manipulation had a major impact on both individual decisions and group shifts, whereas the gain manipulations did not.

Tversky and Kahneman (1981) made systematic reversals of framing of preferences and studied the framing of problems, outcomes and the psychology of choice. They showed that choices involving gains were risk averse and choices involving losses were often risk taking. Thus though the difference was only between the description in terms of lives saved or lives lost, the formulation of decision problem affected the preference significantly.

2.04.4 Time

The effectiveness and usefulness of decision depends upon how fast the decision has been taken and when the decision is taken. This was however, initially studied with the help of digits and alphabets. The experiments with the help of small and large digits and alphabets suggested that
subjects should be able to select larger digits faster than the smaller digits (Fairbank and Capehart, 1969). Decision time was related to the separation of two letters in the alphabets, order of the pair—proper or reverse, and the position of the letters in the alphabets (Lovelace and Snodgrass, 1971).

Greenwald (1969) manipulated importance of decision by varying the consequences of a decision. The value of the choice alternatives increased importance due to decision consequences significantly and hastened the decision.

A doubt was thrown on the direct relationship between the difficulty of a decision problem and decision time. Pollay (1970) hypothesized and supported with experiments that decision-makers take longer to choose when two out of four alternatives are easily rejected than when all four alternatives are equal.

Ekehammar and Magnusson (1973) found that decision time was a positively monotonic function of subjective confidence and amount of information.
2.05 RISK TAKING

A considerable number of studies have been undertaken regarding decision-making under conditions of uncertainty and risk. These include gambling games like race-track betting, and Black-Jack etc., skill chance games like darts and target-shooting, dice games such as coin flips, dice with nonsense syllables etc. guessing games and probability learning games.

Various factors have been noted as affecting risk-taking of individuals singly or in group. Widely held values and individuals' perception of their own riskiness (Stoner, 1968), group pressure (Cecil, Chertkoff and Cummings, 1970), general incongruity adaptation level (Hunsaker, 1971), importance of the decision to the individual (Blitz & Dansereau, 1972; and Higbee & Lafferty, 1972), sex of the decision-maker (Slovic, 1966; Muldrew & Bayton, 1979; Krishna, 1981) were some of the significant determinants studied so far.

The time spent in decision-making increased so also the risk taking; as it reached highest level under optimal information conditions (Streufert and Streufert, 1968).
Strebe and Fraser (1971) examined the relationship between riskiness of decisions and confidence in decisions. They obtained a curvilinear relationship between these two factors showing that on both risky items and cautious items, greater confidence is associated with extremely risky and extremely cautious decisions than with moderate ones.

The interaction of value and subjective probability was evidenced for risk taking in the studies by Crozier (1979), whereas Ridley, Young and Johnson (1981) suggested that relevance and cost are jointly important in decisions involving risk.

Kogan and Wallach (1967) while discussing the pros and cons of superiority and inferiority of collective and individual decisions, commented that the collective decision may represent more prudent and may entail more risk than the individual decisions.

Burnstein (1969) cited evidence to suggest that risky members are more influential than conservative members under hypothetical conditions, but not under real decision conditions.
Brown (1970) tried to compare business administrators and public school administrators for the risk propensity on qualitative and realistic decision problems. Business administrators were found to be greater risk-takers than public school administrators.

High cohesiveness reduced risky shifts, particularly under high perceived social responsibility (Dion, Miller, and Magnan, 1970). Strong affective bonds made individuals less willing to blame their co-members for negative consequences of an advocated action and therefore reducing risky shift. Similar type of findings were obtained - cohesive groups tend to take fewer risks than indifferent or hostile groups - by Yinon and Bizman (1974). Along with this, they also found that subjects under a personal responsibility condition tended to take fewer risks than did subjects under a group responsibility. Riskiness exhibited a significantly positive relationship with sociability and emotional stability but a significantly negative one with extraversion, ascendancy and responsibility in males. For females, riskiness was negatively associated with responsibility (Krishna, 1981).

2.06 TRAINING FOR DECISION-MAKING

2.06.1 Effect of Training

Many researchers have tried to examine the effect
of training of decision-making with the help of undergraduates, college students and university students.

Evans (1969) examined the transfer effect of decision-making skills and found that the directed practice was more effective than the non-directed practice in facilitating the acquisition and transfer of the particular decision-making strategy employed. Sex of the subjects did not appear to be significantly related to learning or transferring the required decision-making strategy.

All the research findings strongly support that the specific instructions for making decisions do enhance the decision-making effectiveness (Nezu & D'Zurilla, 1979; Maier, 1972 and Cormier, Otani & Cormier, 1986) as reflected in superior simulated career choices (Krumholtz, Scherba, Hamel and Mitchell, 1982) and better decisions in socially oriented problems (Nezu and D'Zurilla, 1981). Even the children of 9 to 10 years old were found to have gained significantly greater scores on identifying the problem and offering consequences for solutions due to training (Russell and Roberts, 1979).
Zakay and Wooler (1984) evaluated the effects of time pressure and of training on decision effectiveness and found that training resulted in more effective decision-making only under the no-time pressure condition. So he recommended that specific training methods should be designed to help decision-makers improve their decisions under time-pressure.

2.06.2 Factors in Training

Various factors were found to be influential in training for decision-making. Prior exposure to uncommon responses tended to facilitate problem solving performance (Mallzman, Brooks and Bogartz, 1958). Open mindedness, age level and active participation in the training programme resulted in effective problem-solving (Barber, 1969). The use of decomposition principle helped people to make better judgements especially when the little amount of information was known (Armstrong, Denniston and Gordon, 1975). Anticipation of long-term consequences also appeared to be important (Hautzinger, 1979). The process of clarifying values, emphasizing feelings and acquiring communication skills were found as essential preconditions to value choosing and decision-making (Kirshenbaum, 1973, 1977 and Schechtman, 1980).
Gill (1982) revealed that ability to learn decision-making skills may be related less to intelligence than to other attributes though the other attributes were not defined. The importance of defining long-term goals as well as short-term goals and traditional free thought patterns along with proper problem definitions were stressed by Grossman (1984).

In a decision-making workshop for career counselling for college students, Harris, Golden and Olson (1985) revealed that students felt more prepared to choose a 'Principal Subject' as a result of increased awareness of themselves and of their goals.

2.06.3 Training Methods

Business games, case-studies, role-playing, psychodrama, sociodrama, lectures, and simulation are the various methods tried for training decision-making skills. Simulation technique appears to be the most popular among all these. Though most of the findings were based on studies with undergraduate students, college students and industrial employees, a few studies were also conducted among the primary, secondary and high school students.
No training method among business games, case-studies and role-playing was found to be significantly more effective than the other. There were no significant differences also among subjects with different levels of mental ability (Voth, 1974).

The training in problem solving of real-life situations did increase the skills of the high school students. It helped them to use it in the real-life problems however, did not significantly change either the students' perception of the locus of control of their behaviour, or the level of their self concept (Wilkinson, 1976).

Mathis, Fairchild and Cannon (1980) suggested that socio-drama can provide students the practice in decision-making, and problem solving in a safe, non-threatening context. It helps students become aware of the typical ways they solve problems, increase social and personal awareness and promote acceptance, co-operation and cohesiveness in the classroom. Students especially in primary and secondary education find this technique enjoyable and stimulating for practice in decision-making.
The effectiveness of interactive training as against to the lecture training was tested by Gaeth and Shanteau (1984). In addition to reducing the influence of irrelevance, the interactive training also improved the accuracy of judgements.

The effect of simulation training in decision-making upon intolerance of ambiguity and decision-making ability was analysed by Selverstone (1971). Method of simulation was noted to be helpful for acquiring knowledge of business facts and concepts and the ability of participants to evaluate the business decisions (Livingston, 1971). It also influenced self-awareness, development of fact-knowledge and decision-making skills (Willett, 1976).

2.06.4 Counselling for Decision-Making

Hansell, Hodarczyk and Handlon (1970) described decision counselling method applicable to a wide variety of persons enabling them to face problems more realistically.

Brockway (1975) pointed out the need of counselling for decision-making to the troubled by non-clinical
concerns; whereas watching the counselor's behaviour on video-tape, getting an opportunity to practice the learned behaviour and the feedback on the behaviour were the most influencing factors in learning to teach decision-making (Wallace, 1975).

2.06.5 Career Decision-Making

The field of career decision-making has caught the attention of many researchers since long which is reflected in the variety of studies undertaken. Relationships among career maturity, achievement motivation, anxiety, independence and decisiveness (Northrop, 1976); the effect of self esteem and locus of control in career decision-making of adolescents (Kishore, 1981); coping with disillusionment, abstract images and uncertainty in career decision-making (Baumgardner, 1982); a self responsibility, self acceptance approach to career planning (Brandel, 1982) - were the few studies throwing light on the variety of determinants affecting career decision-making.

Salomore (1932) tried to distinguish between undecided persons who do not have sufficient information to make a choice and indecisive persons who are psychologically
incapable of making a choice and acting on it. He pointed out that attention must be given to issues of identity, self-esteem, self-confidence, autonomy and interpersonal maturity.

The value clarification approach, helping students to define their self concepts, to identify their future roles, to identify meaningful career opportunities and to develop a flexible life plan was described by Reeves and Reeves (1982).

2.06.6 Training Programmes

John Adair (1971) introduced a training approach to decision-making primarily for managers in industry, commerce and public services.

Miller - Tiedemann (1974) described a comprehensive nine-week programme of education in decision-making known as 'Sense of Future Career Class' for high school students. The eight step technique for solving everyday problems was described by Grant (1974).

The Steps are -

(a) Defining the problem

(b) Making a list of alternative solutions
(c) Determining criteria against which the alternatives will be judged
(d) Collecting data on each alternative
(e) Assigning weightage to each criterion
(f) Developing the matrix
(g) Applying the weightage to the total of each criterion, and
(h) Determining the solution to the problem.

Kepner and Tregoe (1965) emphasized the proper use of information - the raw material essential for decision-making — in the training of managers to improve their performance.

Juniper (1976) developed a four stage training programme - Aim, Information, Evaluation and Decision — for high-school and college students.

2.06.7 Tools of Decision-Making

Panel Consensus Technique was developed by Taylor (1972) as a new approach to decision-making. The aim of the technique was to reach an agreement while selecting the course of action to the problem that would give the best results. It consisted of five action levels - Ideate, Screen, Select, Refine, and Decide.
'Decision-Tree' was suggested as an analytical tool for decision-making (Mathew, 1981) by helping the decision-maker in clearly delineating the sets of decision alternatives and in choosing the alternative which provides the highest expected reward. Chadbourne, Rosenberg and Mahoney (1982) successfully constructed a tool for career life planning. This was in the form of a puzzle of pieces representing the world.

2.07 CULTURAL DIFFERENCES

The references that threw light on the cultural differences in decision-making though few in number were noteworthy.

Nishiyama (1971) while studying the managerial decision-making and communication variables in the foreign affiliated Japanese companies and the Japanese companies, found that both the groups consulted the same number of persons and equally preferred the mode of face to face communication. The study also indicated the change in the Japanese management practices to accommodate demands of high industrialization. Hong (1973) reported evidence in support of the culture-value explanation of risky and
cautious shifts by comparing Chinese and American students. Chinese students were more cautious than the Americans in making solitary decisions. Cautious shifts occurred among the Chinese when they made the decisions as a group and risky shifts occurred among the Americans. Results of Indian and American managers showed (Palmer, Veiga and Vora, 1981) that two dominant value profiles designated as 'pragmatic' and 'altruistic' were present and these helped in explaining variances in decision preferences. The cultural difference of socialization and family decision-making was recorded by Poole, Sundberg and Tyler (1982). American adolescents indicated the greatest amount of autonomy and the highest influence in decision-making whereas the Indian subjects indicated the least.

Mann, Radford and Kanagawa (1985) while comparing the Japanese and Australian children, noted that Japanese subjects were more likely to adopt an 'equal-say' rule while Australians tended to use decision rules that followed self-interest and favoured their own group.
While describing the stages in cognitive development of children, Piaget pointed out that the children become able to organize a situation, attend to a problem and begin to reason correctly to make logical inferences and to understand causal relationships at the 'formal operations' stage. At this stage, when they are older than 11 years age, they are improving their problem solving abilities and the abilities for scientific reasoning (Klausoneier and Ripple, 1971, pp. 406 - 413).

Kleber (1970) and Schvaneveldt and adams (1983) suggested that ability affects the decision behaviour a great deal. Children from 1st to 6th grade noticed their own desire to take their own decisions. Though they were not aware of this, teachers reported their observations accordingly (Wolfson and Nash, 1968). The observations also indicated that children thought of the repercussions of their own actions even at the age of 4 to 6 and chose the behaviour that provided the promising material gain as compared to security (Schubring, 1970). A commitment warning situation initiated a psychological set to approach decision problems carefully and decisively not only in adults but even in case of children of 4 to 5 year
olds (Mann, 1971). Though he did not come across any racial differences among Negro, American and Australian children, the older children were found to show more maturity in their decision-making than the younger ones. McPartland (1971) suggested that since the skill in decision-making develops as one matures and takes active part in society, children should be given the opportunity to participate in decision-making more often.

Wilkinson (1976) observed the effect of real-life training in problem-solving upon high school students, the level of their self concept and their perception of the locus of control of their behaviour. The training increased the skills the students used in their solution to real-life problems, but did not significantly change students' perception of the locus of control of their behaviour or level of self concept.

'Socio-drama' technique was the appropriate technique for primary and secondary school children to practice problem solving according to Mathis, Fairchild and Cannon (1983). It provided a safe, non-threatening atmosphere helping students to become aware of the typical
ways they solved problems, increased social and personal awareness and promoted acceptance, co-operation and cohesiveness in the classroom.

A comprehensive nine-week programme of education in decision-making for high school students - training programme for children - was suggested by Miller - Tiedemann (1974). Juniper (1976) developed a training programme for school and college students, whereas risk, gain, social benefits and the nature of the decision were the variables discussed by Gaylin (1932) to improve the students' participation in decision-making concerning their own lives and future.

A few studies were undertaken to reveal the personality characteristics of children getting success in decision-making. Barber (1968) showed that concentration, curiosity, purposiveness, ability to solve practical problems influenced skill in decision-making. Further she also revealed that along with these factors mentioned earlier, mathematical ability, rote memory, good imagination and maturity were significantly related to scientific decision-making; and concluded that the successful decision-makers were eager to learn (1968).
Dean and Garabedian (1981) investigated the personality characteristics associated with a learner's cognitive rigidity. Tenseness, compulsivity, group dependency, absent-mindedness, sensitivity and emotional stability explained the variability in subjects' rigidity in a reliable manner.

Sato (1983) found that impulsive boys took more risks than impulsive girls and reflective subject of both the sex.

A considerable number of studies reflected the significant influence of family on decision-making of children. Non-obese families had higher spontaneous agreement, greater choice fulfillment as compared to obese families. The decisions of non-obese families were more unanimous and less chaotic (Bromberg, 1977). Also if children perceived the decision of their own, they were more likely to stick to it rather than to quit it. (Mcguire and Cook, 1983). At the same time the familial warmth (Swanson, 1974), parents' active role in understanding their children (Atherton, 1976), and utilising their knowledge to mould the child's personality - turned out to be important factors in decision-making of children.
2.09 **DECISIONS IN SOCIAL SITUATIONS**

In case of decisions made in a social context, "The final outcome depends on the actions not only of a single individual but also of other people involved in the decision situation ....................

................ Different types of situations are involved here, but in all, the opinions and actions of other people become as important as the formal costs and gains of the decision situation" (Lindsay and Norman, 1972, p. 563).

The social contexts studied so far included the following —

(1) **The bystander behaviour** — The uncertainty of people to take the appropriate actions was noted in many studies. Latané and Darley (1970) had undertaken a series of such studies and revealed that when the subjects were working alone, 75% of them behaved rationally. But in the presence of others they tended to conform to the actions of neighbours and chose an action that provided the least resistance.

(2) **The effect of authority** — It was noted that people do what they are told to, when they
believe in the legitimacy of authority. Then they pay little attention towards what has been told to them or whether it is acceptable to their conscience. At the same time a general tendency to disobey the authority was also observed (Milgram, 1965).

(3) The bargaining situation - Here the course of action was determined by the interaction and the mutual decisions reached by the participants.

The effect of rationality, good communication, the power at hand and the threat were studied by Schelling (1963).

(4) Decisions in games - Here each player selected his way of action among the available ones, without communicating with the other player, and he received the payoff that was dependent on the combined choice of each player.

Balkwell (1974) studied the 'Balancing Principle' and the 'Utility Maximizing Principle'. He tried to determine which principle more adequately accounts for observable social choice behaviour more particularly decisions of social influence. It was revealed that
both the principles play vital role in such situations and they can not be separated as two independent basic principles.

2.10 IDENTIFICATION OF DECISION-MAKING ABILITY

Wilcox (1972) analysed subjective choice-making and described a technique for measurement of assumptions that could be applied to managerial planning and social science research. Aitchison and Moore (1976) proposed that the performance of decision-makers can be observed and analysed through construction of performance simulation models. Russell and Roberts (1979) tried to measure the decision-making ability of 9-10 years olds with the help of two audiotaped stories. These stories were the problem situations typically encountered in school and home. These situations were used to estimate the effect of training. Ysseldyke and Harston (1982) recommended non-test based assessment procedures to gather decision-making information.

The three approaches to the evaluation of diagnostic decision-making were accuracy, sensitivity and
specificity. Harber (1981) concluded that the worth of a test should not be determined solely on the basis of diagnostic accuracy.

In the study of attention, decision-making was measured as one of the components of attention (Brown and Dynne, 1984).

Some of the instruments that could be used for application also were developed. The CODE system (Categories of Decision-Making Elements) was developed (Stevenson, 1974) as an observational instrument that provided a way to examine teacher influence on decision-making behaviours of young children of three to five years old. Chadbourne, Rosenberg and Mahoney (1982) described a tool in the form of 'Puzzle Pieces of Your World' which was effective in exploring clients' decision-making. The tool helped participants come face-to-face with their own decision-making patterns and the choices they made. This enabled one to understand one's own thought process and the surrounding world.

2.11 INDIAN RESEARCH IN RELATED FIELD

Though the study of decision-making originated in the 19th century, until quite recently Indian researchers
were not attracted towards it.

Kosal (1970) tried to study the decision-making process whereas Pandit (1970) tried to reveal the economic approaches to investment decision making in education. India, being mainly an agricultural country, it is no wonder that the initial studies took place about the farmer's characteristics and the patterns of decision-making process in the use of artificial fertilizer and vegetable cultivation (Singh and Sinha, 1970) along with the participation of rural women in decision-making process related to farm business (Sharma and Singh, 1970).

Shauhan (1970) tried to deal with the family structure, role differentiation and decision-making in the village of Assam whereas Singh (1970) studied decision-making as a function of age, years of schooling, job experiences and family commitment. He noted that decision-making was not significantly related to either of these among the progressive-traditional and successful - unsuccessful agricultural entreprenours.

In the ancient times, the vocation of a child in India was determined by his birth. A son of a Brahmin
was expected to be a scholar and to bestow knowledge, the son of a Kshatriya joined army and served the Nation, whereas the carpenter's son chose carpentry as his profession when he grew old. This was all set and decided. Nobody could think of any other profession but the traditional one. Though recently the changes have taken place in a great deal - now everyone is free to choose the vocation of his own liking. This opened the new branch - to study the occupational, vocational choice.

Desai, K.G. (1972) brought into notice that nowadays the parents and the teachers give more scope to the pupils for deciding their vocation. They agree that the decision should be taken after bringing the pupil into picture. Secondly, though the parents and the teachers appreciate the independence of their pupils, they feel that the necessary guidance should be made available to them. A large section of sample believed that the role of parents and teachers should be to provide vocational information and making of a choice or decision should be left to the pupil himself.

Desai, A.N. (1974) noted that the students' occupational decisions are fundamentally dependent on
and determined by his interactions with other individuals in the society. Dixit and Singh (1975) have pointed out the significant interaction between the expectancy that the reinforcement is contingent on one's own behaviour and the expectancy that the reinforcement is determined by luck, chance or fate.

Sinha and Pandey (1975) located the over-dependency in a large number of Indian people as reflected in heightened anxiety and superstition, escapism, hesitations, asking for all kinds of information and excuses for delayed decisions. This naturally blocked the path of development. They showed that the efficient model induces the efficiency in decision-making. They also studied the effect of reward and noted its cruciality when the model did not stimulate the subject.

Recently, the attention has been diverted to school-going children and their risk-taking behaviour. Krishna (1981) tried to examine the impact of home, health, social and emotional adjustments on risk-taking. It was revealed that sex contributed significantly to risk-taking in case of home adjustment only. Garg (1984) investigated decision-making under conditions of risk and uncertainty in case of
children using a variety of tasks. The results indicated that socio-economic status, age and sex of children influence the decision-making.

Thus it appears that the limitations in Indian culture resulting into stagnation, dependence, not being open to new situations are responsible for the weak developments; and to grow stronger, these cultural limitations should be discarded.

It could be said that recently Indian researchers have recognized the need of studies to be undertaken in the field of decision-making and they have to travel a long way to cover a wider scope.

Recently, decision-making and hemispheric specialization was studied by Jones (1980). The results reflect the specialization of left hemisphere in analytical decision-making. Goldstein, Scholthauer and Kleiner (1935) agreed with the earlier findings that the left hemisphere controls logical, analytical thinking, language and mathematics. In addition to this, they pointed out that the right hemisphere enables the managers to use intuition in their decision-making process.
The use of computers in decision-making has also caught attention of a few. They have tried to study the man-computer interaction in decision-making (Zelman, 1991), human decision-making in computer-aided-fault-diagnosis (Rouse, 1992), and the computer-aided-training for risky decision-making (Bisseret and Faloon, 1992).

Thus, it clearly reveals that the decision-making is a field of interest to almost everyone—which is reflected in a great variety of research undertaken so far. Though most of the work has been done with adults, few studies have dealt with decision-making of children. Recently, Indian researchers have started taking interest and have realized that more studies should be undertaken in this field.

2.12 SUMMARY

Almost everyone would agree that decision-making is an inevitable and a crucial aspect of one's life as it determines the future—the returns that one will derive from the surroundings. Naturally, people from different fields—education, politics, law, economics, industry—have taken interest in studying decision-making.
This has been reflected in a variety of studies undertaken so far.

No agreement has been established regarding the role of intelligence in decision-making. According to some it plays a crucial role while others have noted its significance only limitedly. Similar type of controversial observations were noted about the age of decision-maker. The sex difference of the decision maker was clearly marked in the risk-taking behaviour. The impact of family atmosphere - familial warmth, parents' active role in understanding their children, communication in the family - was noted significantly.

The findings as regards to the training of decision-making strongly supported that the instructions enhanced the effectiveness in decision-making. During the training programmes, factors related to the process of decision-making have been emphasized; though the factors related to the decision maker have not been dealt with.

The single study by Russell and Roberts has been located in which efforts were made to measure the
decision-making ability of 9 to 10 years old children. Here, the investigators wanted to judge the effect of training and used two audio-taped stories - the problem situations experienced at school and home. Indian researchers have recently felt the necessity to study decision-making and are taking interest in this.

Thus it could be said that, the available research though is voluminous, fails to provide the nature of decision-making ability. The cognitive and the non-cognitive factors related to the decision maker, noted so far, are found limitedly conclusive. It also does not provide any reliable tool with the help of which, the decision-making ability of an individual child could be assessed. The present study was an attempt to study this very aspect of the decision-making ability.

The objectives of the present study were -

- to construct a tool with the help of which the decision-making ability of children could be estimated, and

- to locate the cognitive and non-cognitive factors of decision-making ability to throw some light on the nature of decision-making ability.