Impact of Education and Culture on Cognitive Planning: A Comparative Study on Tribal and Non-tribal Children of Dewas District, Madhya Pradesh.

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Certificate

Certified that the dissertation subtitled "Impact of Education and Culture on Cognitive Planning: A Comparative study on Tribal and Non-tribal Children of Dewas District, Madhya Pradesh." submitted by Ms. Deepika Gupta, is in partial fulfillment of the requirements for the award of the degree of 'Master of Philosophy' of this university. This dissertation has not been submitted for any other university and is her own work.

We recommend that this dissertation may be placed before the examiners for evaluation.

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Abstract

The present study attempts to examine the impact of education and culture on cognitive planning of children. This is a comparative study on tribal and non-tribal children of Dewas district, Madhya Pradesh.

The following objectives were framed:

1. To study whether tribal and non-tribal children differ in their cognitive planning.
2. To examine the cognitive planning of schooled and unschooled tribal and non-tribal children.

The following hypotheses were tested:

1. There will be a significant difference in tribal and non-tribal children cognitive planning.
2. Schooled and unschooled children will differ significantly in cognitive planning.

The present study consists of an exploratory research design. The aim of the present study is to explore not only independent effect but also the interaction effect of culture and schooling on cognitive planning with reference to tribal and non-tribal children. The study was planned and conducted in two phases. The first phase focused on the social life of tribal and non-tribal, schooled and unschooled children. In the second phase, different cognitive tasks were administered on children to measure their cognitive planning.

The sample for this study consisted of fifty-nine children. Out of these fifty-nine children, thirty-two children (seventeen schooled and fifteen unschooled children) were tribal and twenty-seven children (seventeen schooled and ten unschooled

children) were from non-tribal families. Purposive sampling technique was used to select the sample.

The data were collected by administering different cognitive tasks to these children, which measured cognitive planning- simultaneous processing, successive processing, and planning. Memory for Design and Raven's Coloured Progressive Matrices were used to measure simultaneous processing. Word Recall and Digit Span tasks were used to measure successive processing. Visual Search and Sentence Composition tasks were used to measure planning.

The important findings were as follows:

1. It is found in the study that tribal and non-tribal children differ significantly only on successive processing. On simultaneous and planning tasks, tribal and non-tribal children performed equally.

Even though tribal and non-tribal children's socio economic status is matched, the findings of the study revealed that non-tribals, have an enriched home environment so far the verbal contact is concerned between children and adults. In non-tribal families, conversations done within the framework of who, what, where, whose, comes first, which provides children an enriched and stimulating home environment (Panda, 1996). They have abundance of general resources both verbal and non-verbal environment which give them an advantages in testing situations specially when the tests are verbal test due to which non-tribal children performed much better than their tribal counterparts on successive processing. The result revealed that tribal and non-tribal subjects did not differ significantly on simultaneous tasks. The reason could be that even though non-tribal and tribal children were matched on their socio-economic backgrounds, the non-tribal families were found to have more of modern gadgets like T.V., tape recorder,

utensils and also modern toys and puzzles, whereas tribal children were found to be in active contact with every aspect of nature and were allowed to explore their world much more at a very early stage of life. This probably compensated for lack of active stimulation at home. Therefore, they performed equally well in those testing situation, which were non-verbal in nature.

In case of planning measures, the tribal and non-tribal children did not differ significantly. Planning is required for effective and systematic solution of a problem. Generation, selection and execution of plans are the three main aspects of planning process. In all these higher order-planning activities the tribal and non-tribal children could not be differentiated. This could be because, very early in their lives, tribal children start taking the challenge of their own life. They establish independent contact with the nature and take their own decision every now and then. Beside, they engage in almost all day -to-day activities of the family, starting from agriculture to hunting to even house making. All these involve different aspects of planning and execution, such as engaging in trial and error methods, sorting out things, priorities etc. These experiences compensates for what they lack at home. Therefore, at early stage of education, the difference in planning skill between tribal and non-tribal is not found. However the gap may increase with increase in levels of education. This also explains why schooled and unschooled children of this age did not differ on planning tasks.

2. Results also revealed that schooled children performed better than unschooled children on simultaneous and successive processing tasks of cognitive planning, whereas on planning measures, schooled and unschooled children did not differ significantly.

The results on simultaneous processing tasks, supports J.P. Das model in which it is said that school subjects like geometry, mathematics, and language emphasize the

perception of logical relationships, which facilitates simultaneous processing. In the present study, schooling is found to have facilitated the development of simultaneous processing. The emphasis on rote memory at the earlier grades in the school possibly helped children in developing successive coding. Successive processing is probably developed through rote-repetition of the curriculum. Results clearly show that the relationship between planning and school learning is weaker than the relationship between coding (simultaneous and successive processing) and school achievement. Das (1980) also suggested in his study that most school learning relate to coding but not to planning skills.

This research may be utilized while planning elementary school curriculum. The two coding procedures, simultaneous and successive processing, which seem to develop well at the elementary school level should be taken cognizance of by the teachers, and instructional programs be planned taking into account the strength of tribal students or groups of students in one type of processing or another. The contents of the curriculum may be taught either in a simultaneous or successive fashion depending on the student's preferred mode of processing information. The research will also help to change teachers beliefs like tribal children lack in abilities, they have an inferior culture, their language is impoverished may affect their academic performance as these may work as self-fulfilling professes.

This study has some limitations like sample size was small, lack of in-depth interview and unequal number of boys and girls etc. This could be explored in future research. Socio-economic status could be manipulated to examine its impact on children's cognitive planning skills vis-à-vis the impact of culture.

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Chapter-1

Introduction

Cognition can be thought of as the act or process of obtaining knowledge, including perceiving, recognizing, reasoning, and judging (Gander and Gardiner, 1981). Cognition involves thinking, knowing, remembering, categorizing and problem solving. Cognition, then, is a process of gaining information and understanding the world. The most important problem relating to the area of cognitive development is the attempt to comprehend how an organism of a particular kind in its encounters with phenomena constructs the world (Kessen, 1960). In a somewhat different approach to the nature of cognitive development, Bruner (1966) apparently choose to use 'growth' to represent transformation to a more developed or mature stage. In her extensive review of the various approaches to cognitive growth, Uzgiris (1968) analyses three major approaches of cognitive functioning, which are characterized as the psychometric approach, structure-of-intellect approach, and the cognitive development approach.

Working under the psychometric approach, both scientists and practitioners have placed undue emphasis upon a unitary concept of intelligence as reflected in the single score I.Q. They seem to have given too much attention to the products of intelligent behaviour rather than the processes used to acquire these products. Such attention to product rather than to process tends to mask qualitative differences in the processes by which individuals interact with their environment and to draw attention away from the possibility of qualitative changes in the nature of these processes during the course of cognitive development.

A very promising approach to the nature of intelligence in recent years is the process developmental (Cognitive development) approach. It focusses upon the cognitive processes used to receive, code, and store information. Cognitive

developmentalists are concerned with the interaction between individuals and environmental events and with the understanding of how such interactions lead alterations in cognitive structure. The cognitive processes in the human beings are based on innovations, which are understood to be adaptive behaviours resulting from experiences. Cognitive innovations are responsive to the intellectual fuctions of accommodation and assimilation. The innovative processes are the bases for the radical change in the cognitive structure resulting from a summation of innovations.

The richest description of cognitive development has been presented by Piaget (1960). He considers intelligence as a general mental adaptability of the organism to the environment or to a limited aspect of it. He is mainly interested in theoretical and qualitative development of what he calls as intellectual structure. What changes with age are the intellectual structure and not the intellectual function? The individual structures his environment through accommodation to stimuli that come from the external source and modification of the environment by impinging a structure of its own by assimilation. Intelligence as adaptation involves equilibrium towards which the cognitive processes tend. Such equilibrium occurs between the action of the organism on the environment and the action of the environment and the action of the environment on the organism. He has partitioned the growth of intelligence into a number of chronologically successive stages each of which is qualitatively different from its preceding and succeeding stages. The growth sequence includes- first stage of cognitive development is the sensorimotor period (birth to two years). This stage is characterized by coordination of sensory abilities and motor skills when a child understands the world largely through immediate action and sensation. The highlight of this period is the achievement of object permanence, the awareness that objects remain the same or continues to exist even when they cannot be seen (e.g. a doll not visible because it is covered by a blanket still exists). The second stage of cognitive development is the peroperational period (two to six years). This stage is characterized by development of language, use of

symbols, and egocentric thinking (e.g. failure to distinguish between one's own point of view and that of another individual). From ages six to approximately twelve, children are in the third stage of concrete operations, which is characterized by performance of tasks involving conservation, in which thinking is governed by fundamental rules of logic. Conservation refers to the ability to recognize that specific properties of an object, such as amount or number, do not change in spite of rearrangement or superficial modification in their appearance (e.g., when a child thinks one sandwich act into four slices is more than another sandwich cuts into two slices). The fourth and final stage is the formal operational period (age twelve through adulthood). This stage is characterized by the ability to deal with hypothetical problems and abstract thinking (e.g., mentally thinking about two different routes that could be taken to the same dimension).

Piaget's theory provides a framework for understanding the child's nature of interaction with environment, and growth norms as determined by maturation and experience.

Influenced by Piaget's writings, Bruner focused on the development of representation in his analysis of nature of cognitive growth (Bruner, 1966). He suggested three main systems through which human beings organize and represent their experiences of the world around: through action (enactive representation), through imagery (ikonic representation), and through language (symbolic representation). These three modes of representation have their specific ways of representing the reality. The mastery of these techniques of representation constitutes in a large measure what he calls cognitive growth. "Cognitive growth in all its manifestations occurs as much from the outside in as from the inside out" (Bruner, 1966). The course of cognitive growth need not run parallel in different cultures because "different cultures provide different 'amplifiers' at different times in child's life". Bruner (1966) clearly admits the role of culture in nurturing and shaping the development of these modes of

representation. Of course his interactionist position is well documented but the extent to which biological make-up shapes the basic organization of man's cognitive processes remains unexplained.

The foregone discussion throws light on the concept of cognition and different approaches to the nature of cognitive development. These approaches can be divided in to two parts- cognitive ability and cognitive processes. Now the question is -

1.1 What Is Measured? Abilities or Processes

The corner stone of the traditional approach to mental measurement has been the concept of abilities. Ability is a trait or characteristic of a person with respect to some mental task that has attained a stable level of performance. Abilities are normally thought of as capacities, which can be measured in a "how much" sense, a person is said to have so much 'ability' in the same way that a container is said to be able to hold so much water. It (ability) is perhaps very close to intelligence. Basically, it is manifested in academic work or school learning. A related question at this point is whether environmental stimulation and academic teaching improves ability. If a major part of intellectual abilities are inherited, a fundamental question is: can genetically endowed intelligence be improved? (Das and Singha, 1975).

Three kinds of intelligence have been proposed: Intelligence A, intelligence B and intelligence C. Intelligence A, the genotypic, cannot be measured directly. It is inferred from measured intelligence, which is B. (Hebb, 1949). Cattle (1971) make a similar distinction between genotypic 'fluid' and phenotypic 'crystallized' intelligence. Vernon (1969) had added to this intelligence C, which contains the artifacts of measuring instruments and procedures. Those like Cattle who believe that intelligence A can never be improved would still concede that B is sensitive to teaching and training because it measures attainment rather than ability. (Das, 1973a). Vernon (1969) observes that tests of

the so-called genotypic 'fluid intelligence' devised by Cattle are essentially tests of spatial-reasoning ability and those of crystallized intelligence measure verbal-education ability. It may be noted that the evidence favoring improvement of spatial-reasoning ability is not well established (Das, 1973b).

The idea that there is a general mental energy driving all mental functions, as Spearman (1927) conceptualized intelligence to be, has been obsolete for some time. Cognitive functions of various kinds are now replacing the one dimensions of intelligence that Spearman had promoted. The cognitive revolution has brought us back to a consideration of mental or cognitive processes, "Instead of being excluded from science, subjective mental states intrinsic to brains are reconceived to be indispensable for a full explanation of conscious behavior and its evolution. The causal status of mental entities requires a shift to a new form of causality, a shift specifically from conventional micro-determinism to a new-macro mental determinism involving top-down emergent control" (Sperry, 1991, p. 222).

Cognition emphasizes the mental operations that execute, and clearly some of these are under conscious control." Individuals may have capacities that they do not know how to use, and they may not realize which they should be using. Strategies, conscious plans for performing tasks, are responsible for deploying abilities, yet traditional assessment avoided strategies and their assessment. Because strategies maybe more relevant to changing performance, it seems crucial that they be the subject of assessment. Traditional approaches emphasized the stability of abilities and thus saw no need to investigate the more changeable components." (Das, Kirby and Jarman, 1975, p. 10.)

In recent years, there has been a shift from the study of abilities to an inquiry into processes, which determine an individual's level of performance. According to Luria (1971), one may view cognitive activities as "a social phenomenon in origin, and as processes formed during the course of mastery of general human

experiences" (p.263). In other words, intellectual processes are not unchangeable and universal. They are shaped by the experience through which a subgroup passes, and their experiences are not only reflected in what they think, but also in the structure or style of thinking. Cognitive processes "are not independent and unchanging abilities or functions of human consciousness; they are processes occurring in concrete, practical activity "(p.266).

1.2 Planning and the PASS Theory

During recent years a comprehensive model of cognitive processing has been advanced with planning as a central concept (Das, 1973, 1980, Naglieri and Das, 1990). The Planning, Attention, Arousal, Simultaneous and Successive (PASS) cognitive processing model is described as a modern theory of ability that is based on A.R.Luria's (1973) analysis of brain structures and functioning.

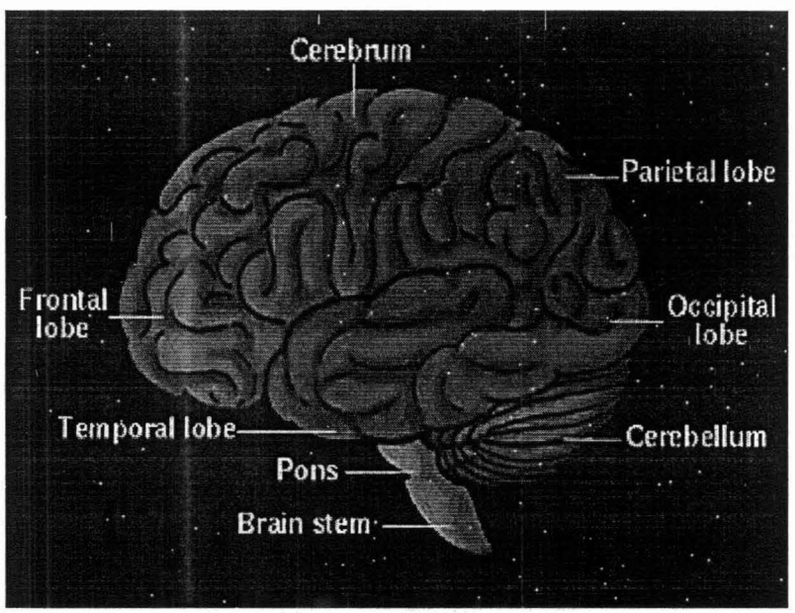
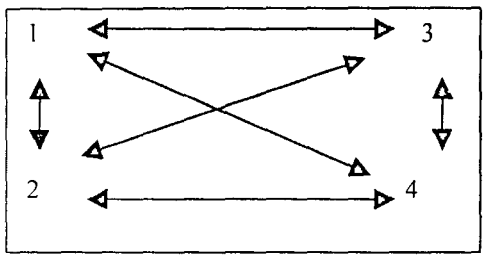


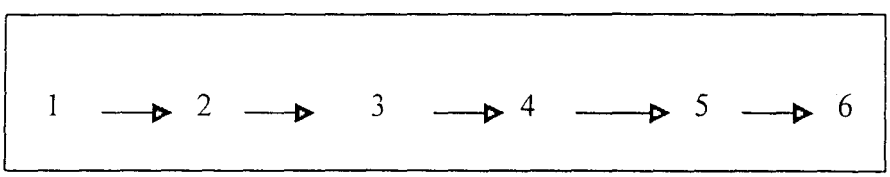
Figure 1.1 Brain Structure and Functioning

Luria (1970, 73, 80) described human cognitive processes within a framework of three functional units. The first functional unit of the brain, the attention arousal system, is located mainly in the brain stem. This unit provides the brain with the appropriate level of arousal or cortical tone, and "directive and selective attention". The function of the first unit is the regulation of cortical arousal and attention. This unit is the base of human mental processes because it maintains a proper state of arousal or cortical tone that allows for the focus of attention. Insufficient performance of this first functional unit, therefore, leads to difficulty with information coding (simultaneous and successive processes) and planning due to an under-arousal or over-arousal of the second and third functional units as well as difficulty in selective and organized responding (Luria, 1973). The second functional unit of the brain is responsible for reception, coding and storage of information arriving from the external environment through sensory receptors. It is located in the lateral regions of the neocortex, on the convex surface of the hemispheres of which it occupies posterior regions, including the visual, auditory and sensory regions (Luria, 1973a). Luria (1966) states that 'there is strong evidence for distinguishing two basic forms of integrative activity of the cerebral cortex, by which different aspects of the outside world may be reflected". These two types of processes are simultaneous (integration of stimuli into synchronous and primarily spatial groups) and successive (integration of stimuli into temporally organized serial order). In Simultaneous processing, the individual codes different pieces of information simultaneously, such as in copying a geometrical figure or finding the missing piece of a pattern. This process involves the integration of stimuli into groups, or the recognition that a number of stimuli share common characteristics. Both of these aspects require that all the stimuli be related to one another. The relationships among the components of a simultaneous task are illustrated in the following figure 1.1:



Simultaneous Processing (figure No. 1.2)

Successive processing involves the integration of stimuli into a particular series where the elements form a chainlike progression. The critical aspect of successive processing is that elements must be ordered without surveyablity. In contrast to simultaneous processing in which the elements are interrelated in various ways, in successive processing the elements are only linearly related. For example, successive coding is needed for skilled movements (e.g. writing) because this activity requires "a series of movements which follow each other in a strictly defined order without surveyability" (Luria, 1966,p.76).



Successive Processing Diagram (Figure No. 1.3)

The third functional unit of the brain is located in the prefrontal area of the frontal lobe of the brain. This functional unit (Luria, 1973) allows the individual to form plans of action, carry them out, and verify the effectiveness of the plans. Das (1984) suggest that planning is the essence of human intelligence, as it involves the aptitude for asking new questions, solving problems, and self-monitoring as well as the application of information coding processes. The generation, selection, and execution of plans are the three main aspects of planning. See figure 1.3 illustrates,

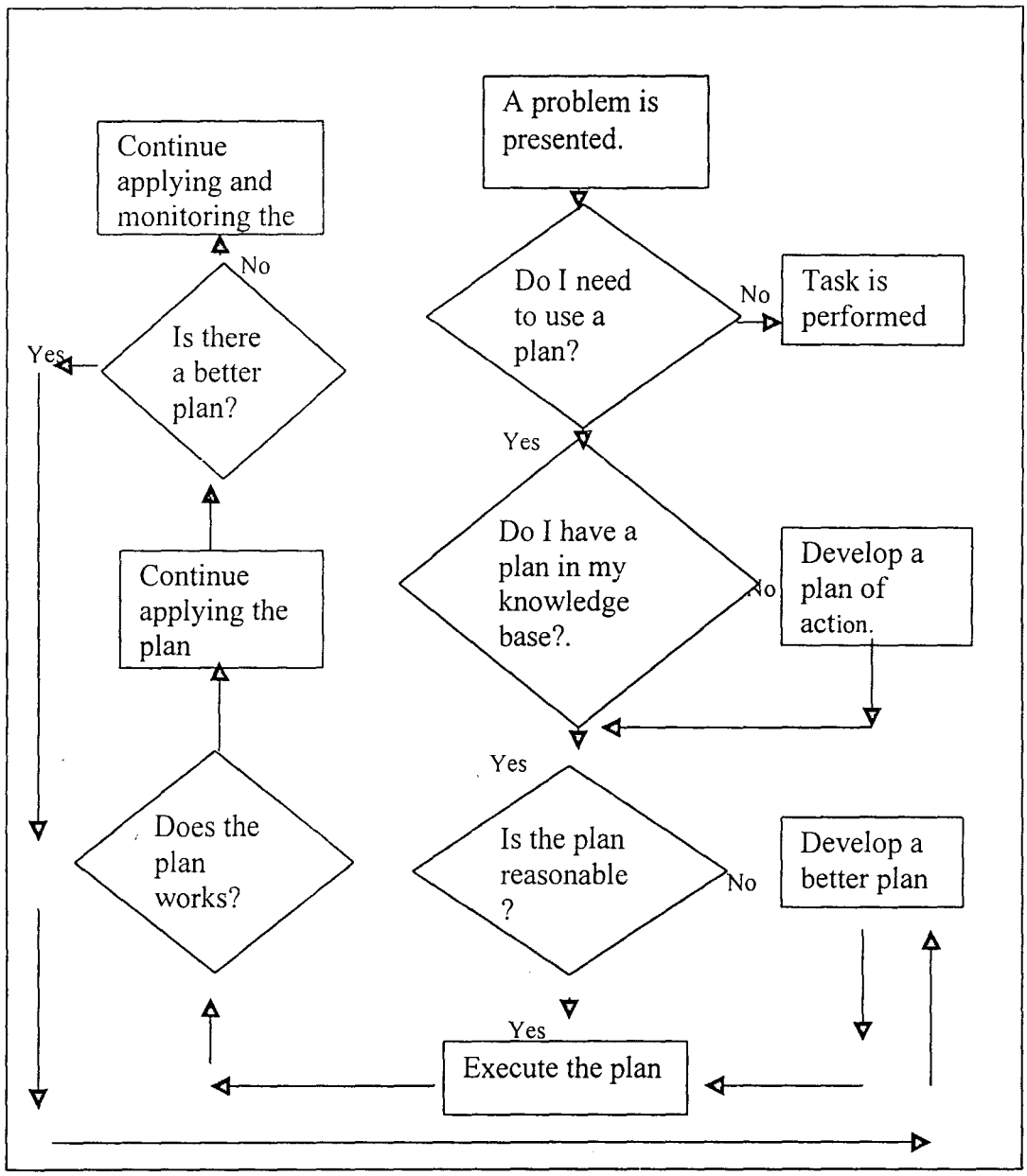


Figure 1.4 Planning Processes Path Diagram

Good planning typically involves a series of executive actions that includes various components as shown in the above figure 1.3. First, a task is presented to the individual and he or she determines how it is to be solved. It may be a complex or simple task and may involve attention, simultaneous, and successive processes, but the main requirement is to determine how to solve the problem. Next, the need for a plan is determined, and if a systematic approach to solving the problem is apparent then the individual searches his or her base of knowledge for an approach. If one is not within the knowledge base, an initial plan of action is developed and the plan is examined. If it is acceptable, the plan is implemented, but if not, a new plan is devised. If the plan is put into action,

decisions are made to modify the effectiveness of the approach. It continues applying the plan, modify it to achieve the most efficient approach to problem solving, or generate another one. This last step is iterated until the task is completed (Das, Kar and Parrilla, 1996).

1.2a Relationship among the PASS Processes

The three functional units mentioned above are dynamic in that they respond to the experiences of the individual and are subject to developmental changes, and form an interrelated system. The interactive and influential nature of attention, information coding, and planning is illustrated in figure 1.4.

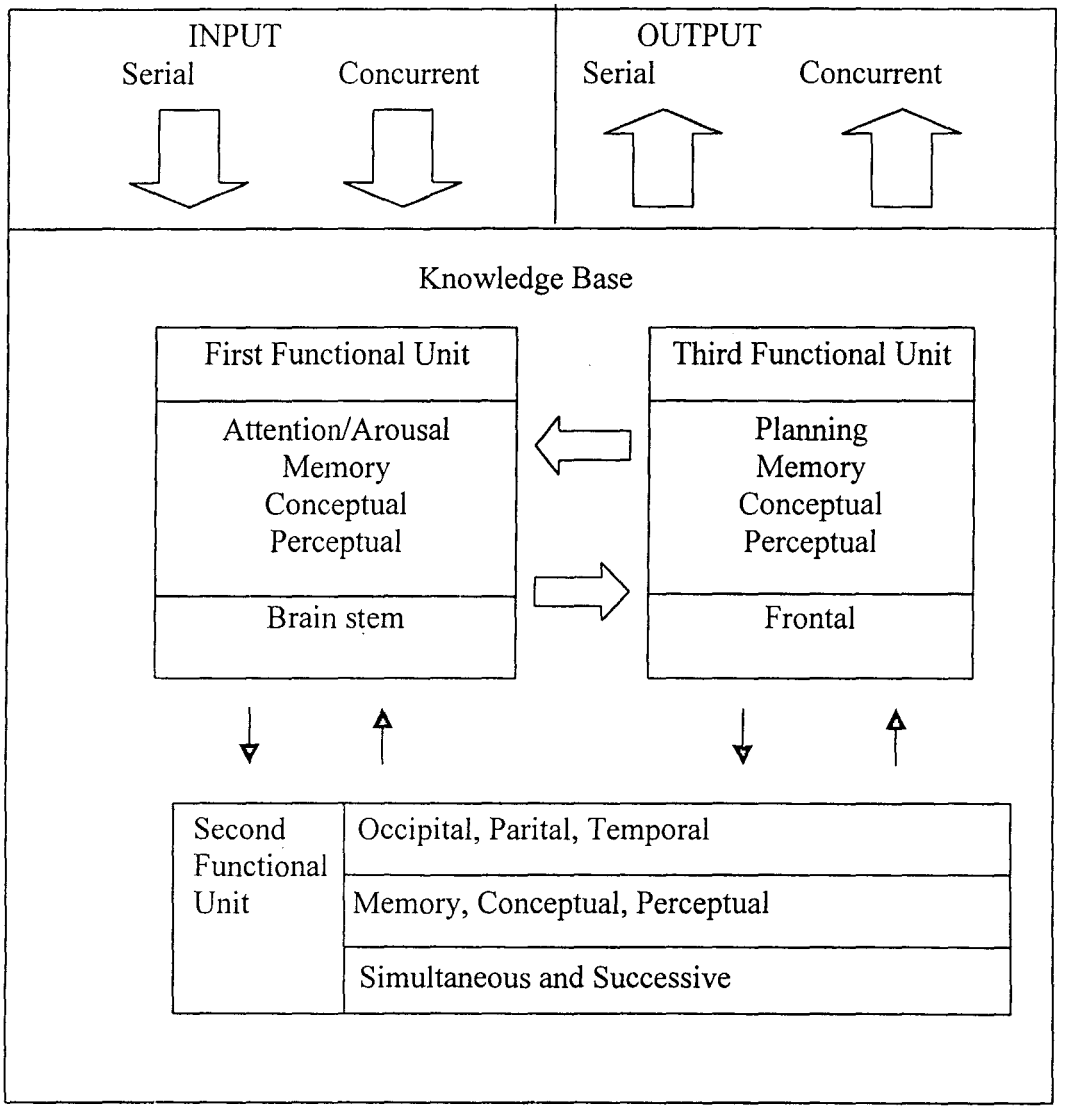


Figure 1.5 The PASS Model of Cognitive Processes

As depicted in figure 1.4, planning processes are closely connected with attention, on the one hand and with simultaneous and successive processing, on the other. In accessing an individual's information processing skills, planning processes are needed when a test requires that the individual make decisions about how to solve a problem; execute an approach; activate attention, simultaneous and successive processes; monitor the effectiveness of the approach; and modify the approach as needed. Planning processes are also involved when a person is asked to decide how to perform a test and these processes are inhibited when strict rules about how to perform are imposed. For example, writing a composition involves generation of a plan, organization of ideas, control over what is presented and when it is presented, examination of the preliminary product, and modification of the plan so that the final result is consistent with the goal. Planning processes allow the person to guide the course of activity and to utilize attention simultaneous and successive processes as well as the base of knowledge, in order to achieve the goal (Das, Kirby and Jarman, 1975).

Knowledge base is an integral component of the PASS model and as a result, processes are always embedded within the dimension. The base of knowledge included in the above figure 1.4 is intended to represent all information that an individual has obtained from his or her cultural, educational and social settings. In a sense, the knowledge base determines the form of mental activity undertaken by an individual. Children's use of language analyze, generalize, and encode experiences (Luria, 1976, p.9) is a critical determinant of the knowledge base because mental processes cannot develop apart from appropriate form of social life.

The PASS model view planning as a functional system. In the following section planning will be defined within this framework and try to provide an integral picture of the nature of planning as a cognitive activity.

1.3 Defination of Planning

Planning consists of programming, regulation, and verification of behavior (Luria, 1966). Planning is a set of decisions or strategies an individual adopts and modifies to solve a problem and to reach a goal (Das, 1980).

These definitions are drawn from cognitive psychology and neuropsychology and share one element, the direction and evaluative role of planning.

1.3a Three Levels of Planning

Leontjev (1978, 1979) has introduced three levels of planning- activity, action and operation.

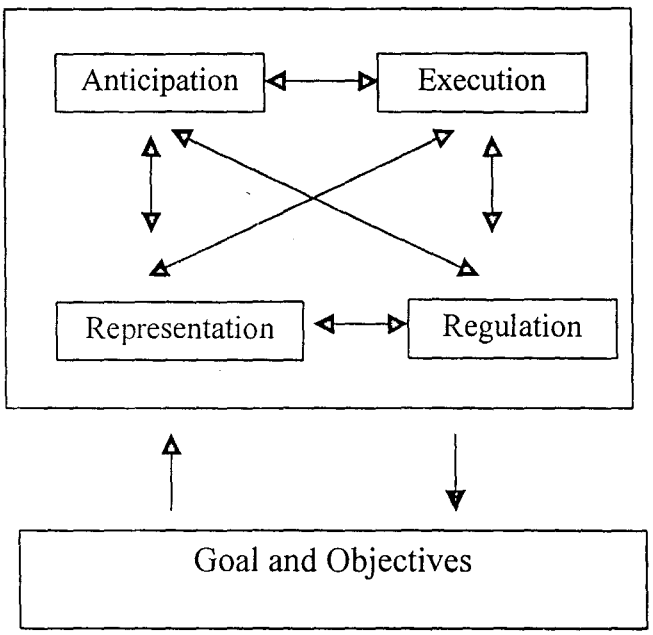
At the level of activity, planning can be conceptualized as a method of realizing or aiming toward one's general life goals and motives such as- self fulfillment, self improvement, career development etc. This means that 'activity planning' is future oriented.

Action planning is equivalent to problem solving. It aims at achieving a particular goal or solving a particular problem. Everyday examples of action planning include scheduling daily meetings, running errands efficiently, or planning a supper for relatives coming over.

At the level of operations, plans are equivalent to strategies and tactics, and consist of working toward the solution of a problem in accordance with task-imposed constraints (i.e. meeting environmental conditions). Everyday examples of operation plans would include locating a book in a library or using household machines and computers.

1.3b Components of Planning

There are five components of planning: goals and objectives, anticipation, representation, execution, and regulation. These components are meant to summarize the definition of planning.



Components of Planning (Figure 1.6)

The generation and selection of goals and objectives is an integral part of planning activity. All planning is guided by a goal or purpose, although the objective may not be readily available to the planner.

Anticipation includes the ability to predict the consequences of a plan or a behavior, the selection and shaping of environments in order to reach favorable consequences, and the selection of subgoals.

Representation involves several activities: plans, considering conditions for their application, and setting up subgoals when the ultimate goal is too distant and requires a complex set of activities. It includes both the original plan of action and dynamic sequence of alternative activities.

Execution can consist of planning-in-action or carrying out an advance plan of action. Finally, regulation refers to the monitoring and controlling of behavior according to the plan and revising the plan when necessary.

Thus, in figure 1.5 the components of planning are represented at two levels. The first level is formed by goals and objectives. As mentioned earlier, planning is inseparable from its goals and objectives (i.e., from its purpose). The second level consists of an interrelated network of four components that constitute the act of planning and work under the guidence of goals and objectives (i.e., the first level). The arrow connecting the two levels, however, is bidirectional. This implies that whenever new information is found in any of the components at the second level, it may influence the first level by changing the goals and objectives (Das et al, 1996).

1.4 Metacognition

A key component of planning is metacognition, the awareness of and knowledge about cognitive processes. The absence of metacognition can frequently explain the failure of instruction. Students are commonly taught content (i.e., knowledge, particularly declarative knowledge) and how to do things (i.e., skills and strategies, or procedural knowledge). What they often fail to acquire is an understanding of why that knowledge is important as well as how and when it should be employed. In short, they lack metacognitive knowledge about when to use their declarative and procedural knowledge and are therefore unlikely to see the value of that knowledge or be able to retain it (Das, Kirby and Jarmen, 1975).

Two aspects of metacognition should be mentioned in order to strengthen its links with planning. (A) Motivation: An individual does not engage in metacognitive activities without a purpose and a need. (B) Cognitive development: Metacognition appears to involve two stages of development (Kirby and Moore, 1987). The first stage appears at approximately age 5, when children begin to take conscious control of their strategies or thinking. The

second stage emerges at approximately age 12, when children begin to take a more abstract analytical and systematic approach to controlling their thinking.

So the foregone discussion shows that the processing approach analyses an act of cognitive processes in terms of how the individual approach a task or problem, and the strategies and plans he/she uses to reach a solution. These plans and strategies an individual selects and utilizes are determined partly by the reinforcing history of socio-cultural milieu and partly by the task demands (Das, Naglieri and Kirby, 1994; Rath, 1994).

1.5 Education and Cognitive Processing

Most of the studies observed that schooled children performed better than their nonschooled counterparts. These studies suggest that something in schooling promotes cognitive development. Bruner (1966) points out that the use of written language in school facilitates linguistic competence and thus symbolic functions in general. Language is the prominent mode of transmitting and acquiring information in school (Das and Dash, 1984, p.192).

In school, learning of a concept begins with a verbal formulation of a general rule. Over the course of time, the student connects this general rule with empirical referents. So it is not surprising to find that school children give a more adequate description of the rules of problem solution than to their non-schooled counterparts (Scribner and cole: 1973). Another consequence of schooling, as noted by Scribner and Cole (1973), is evident in a child's ability to regard an event as an instance of a general class of events, and to search for general principles that can be applied to understand specific instances. A similar observation has been made by Vygotsky (1962), who suggests that children in school engage in a process of inductive reasoning while mastering scientific concepts.

Dash and Das (1984, p.204) observed that simultaneous and successive processing seemed to increase both as a function of age and educational

experience. Through successive years of schooling experience, the differences between the schooled and non-schooled groups became increasingly wider in favor of the former.

In school children learn the alphabet, and learn to write letters and words. The skills required for writing letters involve analyses of the letter patterns and subsequent reproduction of these patterns. One important aspect of the letter writing skill is the child's simultaneous grasp of the structural components of the letters, which through extended practice imparted in schools improves gradually. A failure in this skill results is confusion, which is noticed, for example, in the English language when a child confuses between the letters 'b' and 'd' or between the numbers '6' and '9'. Gradually, the child learns to connect letters to form meaningful words, words to form sentences, and then uses sentences to construct small paragraphs to embed a stream of thought in a temporal order. Thus following the initial acquisition of printing and recognizing alphabets, the skill mostly in demand is decoding which requires successive processing (Cummins and Das, 1977). Beyond the initial stage of reading, as the child becomes aware of the semantic as well as the syntactic aspects of sentences and as comprehension is increasingly demanded of the child relational analysis or simultaneous processing assumes an increasingly important role (Das and Cummins, 1978). Thus the development of simultaneous processing is facilitated by schooling as well.

Whereas in case of children who have not attended school, their cognitive processing develops in a different way. Children, Piaget (1952) says, develop cognitive structure on their own, without direct teaching from adults. The most incontestable evidence for spontaneous learning comes from Piaget's observations on infants, who make enormous intellectual progress simply by exploring the environment, before anyone takes the trouble to educate them. In Piget's view real learning comes from experiences that arouse children's

curiosity and give them the chances to work out their solutions on their own (William C. Crain, 1985).

In several studies it has been found that there would be no influence of schooling on concrete operational skills. This may imply that concrete operations develop in interactions of children with their environments, which need not include the experience of schooling. Goodnow (1962) suggests that school curriculum does not incorporate activity-involving manipulation of concrete materials. Children in school do not have enough time for the freedom needed for auto regulating experiences, which, according to Piaget, are crucial in the development of conservation ability. Conversely, they are taught ready-made rules to deal with their environmental problems.

Education seems to be giving knowledge, not cognitive skills. Children enhance their cognitive skills through experience and through the interaction with the environment.

1.6 Culture and cognitive processing

According to Tylor (1971), "culture is that complex whole which includes knowledge, belief, art, morals, laws, customs and any other capabilities and habits acquired by man as a member of society". Herskovits (1950) defined culture as the man-made part of the environment as well as the collective programming of the mind, which distinguishes the members of one group from another (Gardiner and Mutter, 1997, p.4).

In India, there are - tribals inhabiting the forested region of different parts of the country. They are not one homogenous group. In fact, each one of them has a distinct culture in terms of art, craft, religion, belief system, language etc. which is not only distinct from other tribal groups but also from the non-tribal communities.

Now the question is what is tribe? What exactly are the criteria for considering a human group a tribe? According to Hasnain Nadeem (2001), "A tribe is a collection of families bearing a common name, speaking a common language, dialect, occupying or professing to occupy a common territory and is usually endogamous, though originally it might have been so." According to I.M.Lewis (1968), "Ideally, tribal societies are small in scale, are restricted in the special and temporal range of their social, legal and political relations and possess a morality, a religion and world view of corresponding dimensions characteristically too, tribal languages are unwritten and extent of communication both in time and space is inevitably narrow. At the same time, tribal societies exhibit a remarkable economy of design and have a compactness and self-sufficiency lacking in modern society.
According to Majumdar and Madan (1967), in tribal India, a tribe is definitely a territorial group. All members of a tribe are not kin of each other, but within every Indian tribe kinship operates as a strong, associative regulative and integrating principle. Members of a tribe speak one common language.

There are other distinguishing features of Indian tribes. Existence of dormitory institutions, the absence of institutional schooling for boys and girls; distinctive customs regarding birth, marriage and death; a moral code different from that of Hindus and Muslims; peculiarities of religious beliefs and rituals distinguish tribesmen from non-tribals.

The process of learning in tribal culture is different from non-tribal culture. Tribal culture has an oral tradition where most of the socialization experiences of children take place in informal settings (e.g. within the family or among peers and siblings) and a fundamental part of one's daily activities. Informal learning is not characterized by a defined curriculum and is generally picked up by means of observation and imitation. According to Cushner (1990) "The responsibility for learning skill falls mainly on the learner, making it rather personal, with extended family members often playing a critical role in the act of

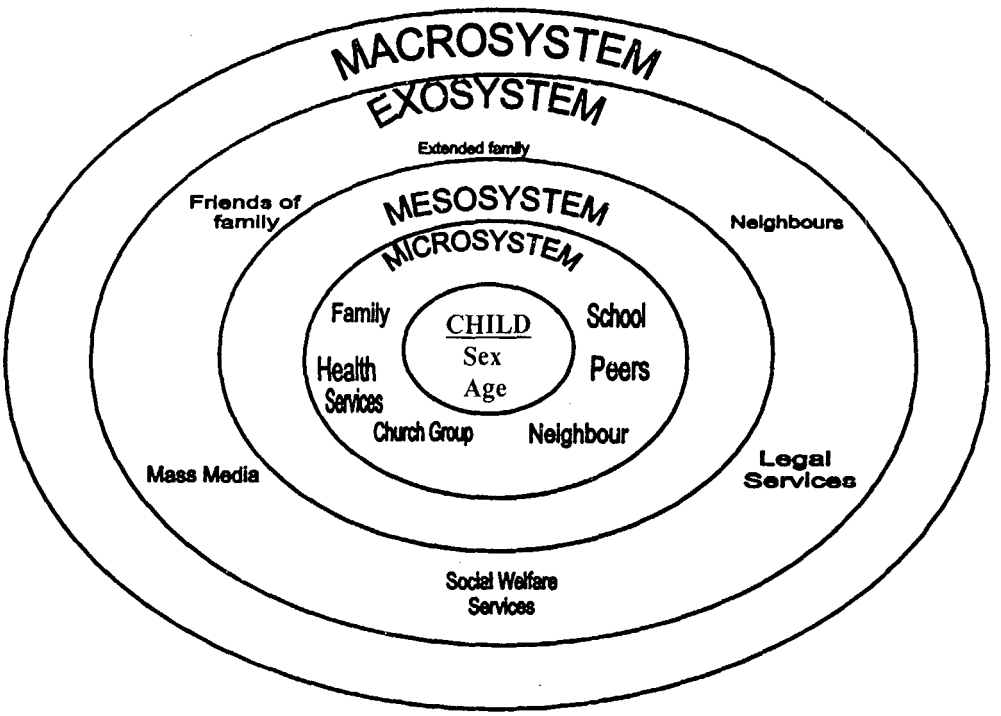
instruction.....change, discontinuity and innovation are highly valued". For example, in certain tribal groups, young boys learn hunting and fishing skills as well as methods for navigating their way through jungles and rivers by observing and imitating adult males in their culture. Girls learn cooking and child rare techniques, not in school, but by helping their mothers in the daily activities of the family.

In non-tribal culture, the majority of children learn important cultural skills as part of their society's formal education system. As Cushner (1990) points out, formal learning is "set apart from the context of everyday life and is typically carried out in the institution we know a school [and is characterized by].... an explicit and highly structured curriculum [in which].... material is learned from a book that may or may not be useful at a later time" (Gardiner and Mutter, 1992).

In tribal communities, learning is based on prior experiences. School as a social institution is a comparatively new environment for tribal children. Research indicates that this is probably the single most important factor contributing to behavior deficits among children of varying ethnic origin. The tribal child starts with near zero linguistic information and conceptualization when they enter school because, the kind of linguistic information and conceptualization they have, doesn't match with what the school emphases (Panda, 1999).

So there is a need to examine the consistency between the cognitive abilities present among children of these groups, and those intended to be developed among them in schools. This exercise is essential to evolve a policy of fruitful education for tribal people in general and for people of traditional groups in particular, which still evade contact from the outside world. It would also be rewarding to pursue an analysis of eco-cultural pressures that operates on the development of cognitive skills, abilities and strategies among them.

There is an ecocultural system approach, which is presented by Urie Bronfenbrenner (1989, 93). This approach allows us to clearly see and understand the connection between culture and development.



Eco-cultural Human Development Model (Fig. 1.7)

Bronfenbrunner has suggested that an individual's perception of the environment is often more important than "objective reality" and that this perception will influence one's expectations and activities. He divides the ecological environment into four levels: micorsystem, mesosystem, exosystem and macrosystem.

The Microsystem: The first level, the microsystem represents the interactions between the child and his environment (e.g. family or preschool) and resulting in behaviors such as dependence and independence and cooperation or competition. It includes home, school, hospitals or day care center. Other factors to be considered include the effects of the physical environment on behavior

including background noise, crowding, number, types of toys available to a child etc. (Wachs, 1987).

The Mesosystem: The mesosystem recognizes that the individual's microsystem in which a child functions is not independent but is closely interrelated and influence each other e.g. home and day care or family and peergroup. This system links or ties together information, knowledge and attitudes from one setting that helps to shape behavior or development in another setting and vice-versa.

The exosystem: Beyond the child's immediate environment are social settings of which he may not be a part but which, nevertheless, influence his development in significant ways. For example- a parent's workplace of the developing child may have a bearing on home environment.

The Macrosystem: The macrosystem is the most complex system and is found in the outermost circle and consists of the customs, values, and laws, which are considered important in the child's culture. The focus is on the consistencies among a wide variety of settings within a given society or culture.

Bronfenbrenner model clearly indicates that culture and environment make significant contributions to one's development. The cross-cultural developmental work of Super and Harkness (1986, 1994) further clearifies this view. According to them every child's development consists of three components- first, the physical and social settings or contexts of everyday life (e.g. one's family), second, the culturally determined customs of child care and child rearing (e.g. interactions with siblings), and third, the psychology of the caretakers or characteristics of a child's parents (e.g. belief system and developmental expectations)." Super and Harkness propose that these components interact and function as a coordinated system in which the

individual and the developmental niche adapt and are mutually influential (Gardiner Harry and Mutter, 1997, p.14).

1.7 The Present Study

In the recent years the ability approach has been replaced by the processing approach. A dramatic change has occurred in the approaches of studying cognition, metacognition and intelligence. The processing approach analyses an act of cognitive process in terms of how the individual approaches a task or problem, and strategies to reach a solution. These plans and strategies an individual selects and utilizes are determined partly by the reinforcing history of socio-cultural milieu and partly by the task demands (Das, Naglieri and Kirby, 1994: Rath, 1994: Luria, 1971).

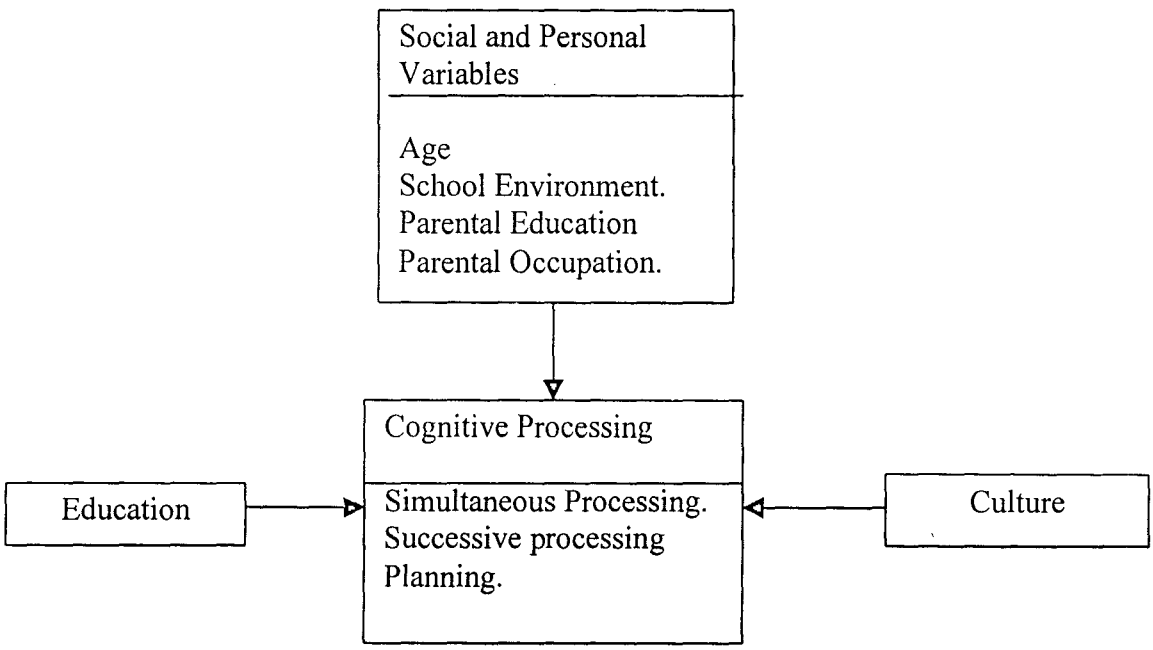
The existing literature available until today reflects that children from low socio-economic and disadvantaged communities invariably perform poorly on academic as well as on ability measures including IQ tests. Cognitive skills and processes develop gradually and much of their shape depends on the environmental facilities and constraints because there is reciprocal relationship between environment and cognition. Several Indian findings (Mukherji, Chatterjee and Gupta, 1991) also indicate that physical, economical and cultural deprivation has got a significant effect on growth of intelligence and scholastic achievement. But there are also some studies, which go against this view and state that there is no such significant difference so far as innate potentiality is concerned. A review of cross-cultural researches maintains that cognitive processes are cultural variables (Rath, 1991). Sinha (1992) also states that the effect of culture was not significant itself but it plays a significant role in conjunction with ecology.

It is evident from the above studies that the typical question has been- do children coming from different cultural group perform equally on cognitive planning measure or school being a major socializing agent make any difference in their cognitive planning. The objectives of the present piece of work were not

only to examine the performance of tribal and non-tribal groups on planning tasks but also to see the effects of schooling on planning tasks.

This study proposes to use above concepts and frameworks to examine the impact of culture (tribal and non-tribal group) and education (schooling and non-schooling) on cognitive planning. The conceptual framework of this study is as follows.

Conceptual Framework



Chapter-2

Review of Literature

This chapter contains a brief review of the researches related to the variables included in this investigation. The studies are grouped into appropriate categories to make the review clear and concise.

2.1 Cognitive Planning

Cognitive planning consists of programming, regulation, and verification of behavior (Luria, 1966). Planning is a set of decisions or strategies an individual adopts and modifies to solve a problem and to reach a goal (Das, 1980). There are several studies which shows that many of the functions that are required for planning take place in the prefrontal area (i.e. in the tertiary zones of the frontal lobes).

Luria (1976) found in his study that patients with frontal lobe lesions do not develop a plan or program for solving a problem. Frontal lobe lesions can cause a number of dysfunctions, both cognitive and non-cognitive. For example motor functions and attention can be disturbed, self-awareness, personality and emotions can be abnormal and sensory perceptual functions, verbal special functions, speech, language, and memory. Cognition and executive system function can be damaged.

Goldberg and Bilder (1987), however, argue that there are several reasons to believe that the frontal lobe is functionally more vulnerable and more likely to "mirror" disturbances affecting different loci in the brain than any other brain structure. There are at least three different reasons for this. First, the prefrontal area has rich connections to other functional system of the brain and affects and receives impulses from these systems. Second, prefrontal cortex is among the youngest cortical areas phylogenetically, as well as the slowest to develop ontogenetically. According to a "Jacksonian" conceptualization of evolution and

dissolution, both of these facts would make the prefrontal cortex more vulnerable to disruption (Goldberg and Bilder, 1987). Finally, if there is generalized structural damage to the brain, it is likely to affect the least over-learned and least routinized behaviors the most. The functions of the prefrontal cortex are therefore more likely to manifest problems.

There are some recent studies that support Luria's findings. Stuss and Benson (1986) found that frontal lobe patients might verbalize a task correctly but fail to use this information to direct this behavior. Thus the finding shows the dissociation between action and knowledge, and action and speech. In another study, they found that frontal lobe damage could lead to reduced motivation and initiation of behavior as well as reduced self-awareness. Thus patient with frontal lobe damage may display problems in both the activation and inhibition of behavior.

Fuster (1989) found in his study on frontal lobe damage patients that any task that requires a frequent change of strategies would be performed poorly by these patients. In this way, frontal lobe damage manifest most commonly is an inability to initiate and carry out novel action sequence for reaching goals.

Mc Carthy and Warrington (1990) identified well over twenty studies that had found problem solving difficulties in patients with frontal lobe lesions. These difficulties manifested in one or more of the following functions: formulation of strategies, anticipatory processes, flexibility and evaluation of performance.

In sum, all the above studies are suggesting that the frontal lobe is the center for planning behavior and cognitive activity.

2.2 Development of Planning

The study of the development of planning skills was neglected by psychologist long after planning had became a central concept in general cognitive psychology.

The studies on development of planning deal mainly with the execution of previously learned plans and not with the actual process of generating plans and implementing them in new situations (Kreitler and Kreitler, 1987).

Pea and Hawkins (1987) study is a good example of a plan formation study with school age children and a developmental focus. They wanted to examine the development of planning skills in two different ways - (a) by comparing the planning skills of two different age groups (8 to 9 year olds 11 to 12 year olds) and (b) by following the "microgeneses" of an individual plan within a planning session. The result of the study indicated that older children were more flexible and efficient planners than younger children. In addition, the efficiency of plans increased from the first to the last plan for both groups.

Passler, Isaac and Hynd (1985) examined the performance level of 64 children between 6 and 12 years of age on several neuropsychological tasks attributed to frontal lobe functioning. They concluded that the development of behavior associated with the frontal lobes seems to be a multistage process and that the greatest development, reflected in improved performance seemed to occur between the ages of 6 and 8. These findings were essentially confirmed by several researchers such as- Backer, Isaac, and Hynd, (1987), Levin, (1991), welsh, Pennington (1988). Scholnick and Friedman (1987) have tentatively suggested that meta-cognition, representational skills, or strategies for self-control play an important role in the development of planning skills.

Kreitler and Kritler (1987) have provided the two most comprehensive studies of planning development aimed specifically at describing its developmental components. Both studies used four groups of subjects (i.e. 5-to 6- year olds, 7-to 8- year olds, 9-to 10- year olds, and 11- to 12 year olds). In their first study, their main concern was with children's conceptions of planning. The results indicated that conceptions of planning are related to the gradually increasing interest in mastering both the environment and one's own processes that is characteristic of

children between 5 and 11 years of age. Their second study focused on the development of actual planning skills. They designed 10 planning situations based on children's answers in the first study in order to gather information about (a) general planning skills, which are present in various tasks; and (b) task-specific responses, which they referred to as; the techniques and procedures of planning. Their first study result indicated that with increasing age, children come to conceive of planning as a complex cognitive activity. At the same time, the second study result indicated that planning as a cognitive activity develops in a variety of ways: plans and alternative plans become more elaborate and flexible; planners become more aware of contextual constraints and begin to ask more questions about them, and begin to consider various "if- than" eventualities; and planners begin to organize information more efficiently with the help of higher conceptual unit.

2.3 Social-Contextual Aspects of Planning

The following studies have resulted in some anecdotal information about the social nature of planning.

Kreitler and Kreitler (1987) and Pea (1982) noticed that 11-year-old children did not regard planning positively in all situations. This could be interpreted as meaning that their knowledge of the social constraints on planning had increased compares to younger subjects.

Rogoff, Gauvain and Gardner (1987) offered a rationale for studies focusing on developmental changes in how different contexts can affect children's planning performance. They suggested that the development of planning skills involves an increase in sensitivity to the characteristics of the problem, its contextual features, and relevant knowledge. It also involves an increase in the skills necessary to contextual plans in advance to the utility of planning in the first place.

In any discussion of cognitive development, schooling is one of the most important socio-cultural factors. Now the question is- can planning be accelerated by schooling?

Das and Dash (1990) administered two simple planning tasks and several syllogistic reasoning tasks to two groups of schooled children (6 to 8, and 10 to 12 years of age) and to two groups of unschooled (same age groups) children. Their results indicated that schooled children outperformed their unschooled counterparts in planning tasks, whereas in syllogistic reasoning, improvement in performance was associated with age and was not enhanced by schooling.

These results can probably be explained by the fact that syllogistic reasoning tasks are commonly present within the oral tradition in rural India, whereas the more formal planning tasks are not familiar to both groups of unschooled children.

Tanon (1991) compared the influences of formal education (i.e. 2 to 4 years of training in weaving) on planning skills. The results showed that schooled weavers generally outperformed other groups in both tasks; unschooled weavers and schooled non-weavers performed at roughly the same level on most variables; and unschooled non-weavers obtained the lowest performance scores on both tasks. The findings suggest that planning can be accelerated, at least to some extent, by relevant education, both formal and informal.

Several authors have explained the findings of no difference between schooled, unschooled children in the following ways:

Goodnow (1962) suggests that schools do not teach children to rely on their own creative and original thinking. Children in school do not have enough time for the freedom needed for auto-regulating experiences, which, according to Piaget, are crucial in the development of conservation ability. Conversely, they are taught

ready-made rules to deal with their environmental problems, rather than learning them through acting on the environmental problems.

The difference between schooled and unschooled children would show up only in situations where schools provide an opportunity for the development of concrete operational concepts, and children do not get these opportunities out of the school environments. Since in technical and industrial societies the cultural environmental properties for the development of certain logico-spacial concepts are adequate, schooling in those settings is expected to have a minimal effect on the development of concrete operational skills.

A number of researchers have also commented that developmental lag reported for non-schooled children may reflect defects in methodology rather than a slower rate of cognitive development (Kamara and Easley, 1977; Nyiti, 1976). These defects include; (a) linguistic and cultural differences between the investigator and the subject; (b) a tendency to treat Piagetian tests as standardized performance tests; and (c) inaccuracy in determining a subjects age in non-western societies.

Accordind to Kamara and Easley, when these difficulties were corrected in some African research, the difference between schooled and non-schooled groups disappeared.

2.4 Simultaneous and Successive Processing

Simultaneous and Successive processing unit of the brain are responsible for reception, coding and storage of information arriving from the external environment through sensory receptors. In simultaneous processing, the individual codes different pieces of information simultaneously, whereas successive processing involves the integration of stimuli into a particular series where the elements form a chainlike progression.

Luria (1966) found in neuropsychological research that simultaneous processing is associated with the occipital-parietal areas of the brain and its essential feature is surveyability, whereas successive processing is associated with the frontal-temporal areas of the brain and involves the integration of stimuli into a specific serial order.

Cummins, J. and Das (1977) found that reading vocabulary as well as reading comprehension was related to both simultaneous and successive factors. In other words, both processes were used by the children who were tested in this study in order to perform adequately in vocabulary and comprehension tasks. Since that time several studies have been carried out essential demonstrating that whereas successive processing may be crucial to the initial stages of reading acquisition. Simultaneous processing is crucial for advanced comprehension skills in reading tasks

T. Mwamwenda, U.N. Dash, and Das (1984) studied whether concrete operational tasks was related to individual differences in simultaneous-successive processing. Although the study was carried out in culturally different population (in Canada and in India), it was observed that children who prefer simultaneous to successive processing did better in the Piagetian tasks of conservation, transitive inference, and class inclusion. But performance in class inclusion appeared to be helped by both processes in the study in India. On the whole, rational as well as empirical reasons were found to claim that simultaneous processing in utilized in the successful solution of concrete operational tasks.

Udaya N.Dash and Shamita Mahapatra (1989) were examined the development of coding and planning processes and to see whether or not planning, as a higher order cognitive functioning. Sixty children, twenty each from Grades, Three, Five, and seven took marker tests of simultaneous and successive coding and planning processes. Result indicated age and grade related changes in the development of coding and planning but grade differences were not as prominent for successive

as it was for simultaneous coding and planning. While the two coding processes got progressively differentiated with increasing age and educational experience, the distinctiveness of coding and planning functions were not clear-cut. Planning in higher grades was found to rely more on simultaneous than successive coding. The reason may be is that by grade Three, successive processing is probably reasonably develops through rote-repetition of the curriculum and there is minimal addition to this until about Grade 7. Hence the three groups did not differ on successive measures as much as they did on simultaneous coding and planning.

Udaya N. Das and J.P. Das (1984) examined the influence of schooling and age on the development of concrete and operational thought and information processing as measured by non-Piagetian tasks. One hundred schooled and one hundred non-schooled children in the age brackets of 6-8 and 10-12 and 50 4-6 year old preschool children from a relatively homogeneous social demographic background in a rural part of India were given four tests for information-coding processes. Half of the subjects in each group were also given four Piagetian concrete operational tasks. Performance on Piagetian tasks increased as a function of age only, whereas the effects of schooling, age and their interaction were clearly observed for coding processes. It is concluded that information -processing skills are more sensitive to cognitive consequences of schooling.

The reason may be is that information coding is facilitated by school system. That's why school children performed much better than unschooled children on the task of information coding processes.

Das, Kirby and Jarmen (1975,1979) have found simultaneous and successive factors and evidence of developmental differences by chronological and mental age using tests such as Progressive Matrices, Memory for Designs, and Figure Copying (simultaneous) and Digit Span forward, Sound blending, and

Sentence Repetition (successive). The studies have involved samples of elementary, middle school age students, and high school age samples.

Simultaneous and successive factors have been identified in a range of culturally distinct setting. Leong, Chang and Das (1978) found evidence of simultaneous and successive processing (as well as planning) in a sample of normal Chinese students in Hong Kong, and a significant relationship between reading and each of these processes, as did Naglieri and Das (1990). These studies and others provide evidence that tasks used to operationalize simultaneous, successive and planning processes have functioned similarly despite wide differences in culture, language and socioeconomic status.

In this way, both simultaneous and successive processes have been related to academic achievement, syllogistic reasoning and other linguistic tasks such as story telling and recall.

2.5 Cognitive Functioning of Tribal and Non-tribal Children

Jachuck (1984) examined the differential abilities of advantaged and disadvantaged children, particularly with respects to level I and level II abilities of A.R. Jensen's model. A battery of tests measuring level I and level II abilities, were administered. Results revealed significant differences between socially advantaged and disadvantaged children subjects in level II abilities only. No such differences were noticed in level I ability. Both home and caste effect were significant.

The result may be explained by the fact that level-I or associative ability in Jensen's theory involves minimal transformation 'input' and is characterized by abilities such as simple conditioning, rote memory, digit span etc. Level-II on the other hand implies elaboration and transformation of information 'input' as in problem solving concept learning and reasoning activities. Home environment like who have limited connection with mass-media, low socio economic status,

poor living arrangements, low parent child interaction, low parental aspiration also have great impact on cognitive abilities.

Ajit K. Mohanty and J.P. Das (1987) were conducted a study to find out the impact of " bilingualism on cognitive and metaliguistic abilities and the relationship between the two abilities among unschooled 7 and 9 year old tribal (Kond) children, 80 children, 20 uniliguals and bilinguals in each age group, were administered- Metaliguistic tasks, Piagiatian conservation tasks and Raven's Colored Progressive Matrices. Result indicated that the effect of bilingualism on metalinguistic ability was not significant. The results were interpreted as supporting the claim that metalinguistic ability is school related and that bilingualism alone, cannot promote it.

Parkash and Parkash (1977) have reported that as far as distribution of general mental abilities are concerned; the student of urban area surpasses their rural and tribal counterparts.

Haywood and Tapp (1966) have concluded in their review that an enriched early environment increases intelligence, whereas impoverished environment may lower intelligence level.

Gupta and Johan studied the differences in cognitive capacity among tribals and non-tribals. Hindi version of General Mental Ability Test (GMAT) of intelligence by Singh (1967) was used with 200 tribal and 200 non-tribal of ninth grade. Non-tribal subjects were superior to tribal subjects in their measurement of intelligence.

R. C. Mishra, Sinha, and Berry (1996) examined the role of some eco-cultural and acculturational factors in intermodal perception of stimuli, which vary on the dimension of size, shape, height, and texture, using Birhor (largely nomadic),

Asur (recently Sedentary), and Oraon (fully sedentary) groups. The finding revealed that the effect of both the eco-culture and acculturational features of the groups was significant, supporting the general prediction of the eco-cultural model. The Birhor better judgment of shape, size, and height on the intermodal perception task may be attributed to their marked analytic abilities, developed during the course of their hunting and gathering activities in the forest. Comparing the salience of visual and tactual modalities for stimulus discriminability, researchers have argued that shape and size are global structural properties of stimuli, whereas texture is a substance related attribute which can be extracted locally (Klatzky, 1987).

The interaction between eco-cultural background and acculturation revealed that acculturation had a significant influence largely on the Oraon group, in the case of the Asur and Birhor groups, the effect was negligible or nonexistent. It was concluded that while the nature of stimuli and the modality of presentation were important factors in the accuracy of perception, eco-cultural demands in dealing with the properties of stimuli and the level of the individual's acculturation were significant factors accounting for variation in the accuracy of intermodal perception.

R.C. Mishra (1996) found that tribal children who spent most of their day in the forests tended to score significantly higher on the SPEFT and the Indian African EFT (Sinha, 1984) than children who spent most of their time in villages with their parents higher differentiation on the part of "forest children "was explained in terms of the greater opportunities for perceptual exploration in the forests as well as independence from parental control. In another study Mishra (1983) analyzed the current status of deprivation studies in relation to cognitive competence and attributed the varied results and ambiguous findings to focus on different aspects of deprivation. Prolonged deprivation (experiential) can lead to impoverished growth of cognitive functions, making experiential enrichment as necessary for fuller psychological growth.

In another study, Singh (1981) investigated the intelligence of santhal and non-santhal students on the Wachshler Adult Intelligence Scale. They found that non-santhal students had higher I.Q. scores than santhal students. Sinha (1980) compared tribal (Oraons) and non-tribal students on non-verbal intelligence. He found that tribal and non-tribal students did not differ on total intelligence scores and different subscales, i.e., Passsing Test, Block Design Test, and Cube Construction Test.

2.6 Socio Economic Status, Caste, Income Level

A Socio-economic disadvantage suffered by certain groups tends to have a detrimental effect not only on the general development of the individual but is reflected on the level of cognition and perceptual skills possessed by the individual.

Jensen (1974) investigated the interacting effects of Level-I and Level-II abilities with race and SES status on very large sample (White N=1489, Black N= 1123) reading in fourth, fifth and sixth grades in 14 elementary schools and belonging to upper, middle and low SES. Level-I was assessed using Digit Span memory and Level-II was measured by Lorge Thorndike Tests of Intelligence: verbal and non-verbal. Low SES black children did most miserably in Level-II compared to other SES groups, thus strengthening the deprivation effect on intellectual deficits. Jensen (1971) has demonstrated that children from low SES use associative learning strategies and evidences are found to suggest that low SES children use sequential processing than simultaneous processing in tasks, which demand simultaneous processing.

Molloy (1973) examined the relationship between the socioeconomic status and processing modes by giving the battery of cognitive tests to 30 low SES children and 30 high SES children each of grades 1st and 4th. The tests used in this study were figure copying, Raven's Coloured Progressive Matrices, Digit Span Forward,

Visual Short Term Memory, Memory for Designs, Serial Recall, Free Recall, Cross Modal Coding, Stroop's Colour Naming and Color Word Test. The results indicated that high SES children are superior to low SES Children in almost all cognitive tasks at both the grades. Further factor analysis results revealed that three factors like simultaneous, successive and speed were obtained in each of those groups. It was noticed that there were minor disparities in factor loading of some tests.

Singh (1976) reported an empirical study on "Social Disadvantage, Intelligence and Achievement" which clearly highlighted the role of caste, income, and tribal background in contributing to cognitive performance. Six hundred students in Ranchi district of Bihar were administered Porteus Maze test to measure intelligence and language and Arithmetic Test to measure scholastic achievement. The socially advantaged group had higher intelligence in rural and urban schools. Even after matching the socially advantaged and disadvantaged groups in intelligence, age, sex, and rural urban residence, the former had significantly higher scholastic achievement.

Jachuck and Mohanty (1974) reported on the effect of low SES belongingness on non-verbal reasoning and verbal ability as two forms of basic cognitive skills. 100 children were selected from high SES and low SES groups (on the basis of income and from age groups (8-10 years and 14-16 years). The four sub-cultural groups generated by age and SES was closely matched for school and class. Raven's Progressive Matrices and the Stroop's tests were administered. In both the age groups the high SES children performed better on each of the tests than low SES. Greater difference was noticed between the SES groups at the higher than at the lower age level suggesting the cumulative deficit hypothesis or progressive retardation with age. But the effects of class and caste remained to be confounded in this study.

Das (1973) on the basis of a series of studies in India has reported that high caste-status and high income help the development of cognitive competence. Both caste and income separately and independently have their impacts. Das and Singha (1975) studied the effects of caste status and income level on the performance of several cognitive tasks such as Raven's Coloured Progressive Matrices, Graham Kendell's Memory for Designs, Cross-Modal Coding, Visual Short-term Memory, and Figure Copying etc. The performance of the low caste children was inferior compared to that of the high caste children. The rich Brahmin children with the double advantage of high caste status and high income were superior to all. The authors have suggested a general orientation for explaining performance deficits in low SES children.

Pappachan (1983) conducted a study to compare the intelligence scores of pupils to different levels of socioeconomic status (average age, fourteen years). Samples of 190 ninth grade pupils of both urban and rural areas of Kerala were used for the study. The pupils were divided into High Socio Economic Status (HSES), Average Socio Economic Status (ASES) and Low Socio Economic Status (LSES) groups on the basis of the total weight age given to income, occupation and education of their parents. The difference was significant in case of HSES and LSES, and HSES and ASES groups. In the case of LSES and ASES groups the difference was not significant.

P.Das (1988) identified and compared the structure of cognitive abilities among normal and tribal children at two different age levels i.e., under seven and above ten years. The normal children were divided into two groups namely high SES and low SES. The findings clearly indicate that younger children took more time and committed more errors than that of older children. Similarly, the tribal children took more time and committed more errors than low SES normal children who were inferior to high SES normal children in these tests. These findings clearly indicate that low SES normal and tribal children are poor in perceptual ability and have more interference effect than the high normal

children. In this study the researcher used the word 'normal' for non-tribal children, which is inappropriate. Tribal children are not abnormal.

Abdul Majeed and E.S.K. Ghosh (1981) conducted a study on the sample of 60s subjects with unequal number of subjects belonging to high and low social class from three ethnic groups in high caste, Muslim and schedule caste. The result indicated the significant main effect of social class. However, the main effect of ethnicity and interaction were not obtained. It appears that in high social class, more use of liberal child rearing practices, independence or autonomy enhancing types of socialization are probably more exercised and contrary in lower social class background, perhaps, the use of restricted and regulated child rearing practices and strong emphasis of obedience in the behavior as well as the socialization of adherence to parental social and political authorities are frequently practiced which foster the development of low cognitive differentiation. The lack of ethnic differences in cognitive differentiation could be due to larger similarity in those socialization practices, which have been found highly associated with psychological differentiation ability.

According to Dash (1982) low SES level, lacked the specific achievement motivational variables such as - 1) realistic aspiration levels, 2) need for setting a goal and efforts to attain it, 3) fear of failure and striving for success, 4) parental achievement demands, 5) need for recognition and approval, 6) future orientations, 7) strong task involvement, 8) need for task completion, and 9) imaginative flexibility to explore alternative approaches or path to a goal, leading finally to lack of involvement and persistence in school relating task.

Tripathi and Misra (1975) have noted a liner relationship between deprivation and intelligence. Mohanty (1980) observed that socio-culturally advantaged children performed better than disadvantaged children on the RPM (coloutres form). In another study it has been found that SC and NSC students of first, second and fifth SES levels didn't differ in their intelligence. It follows that caste difference is

more pronounced for the middle class subjects. In contrast, studying the effect of ecological background (better community Vs. slum) and poverty levels on I.Q. scores. However, subjects of a economically rich community had higher I.Q. scales in comparison to slum children.

2.7 Gender differences in Cognitive Functioning

Sex differences had been reported in some studies on field-dependence and field-independence. Witkin and Berry (1975) indicated that males scored in a more field independence direction as compared to females. Tyler (1977) in a study conducted on 4 to 8 years old, found distinct differences in cognitive style preferences, with males showing more analytical responses and females more relational or global responses.

Ray, Mainmarji (1988) while comparing Senthal and Kond tribes intelligence and intelligence difference between male and females observed that Santhal male has statistically superiority in intelligence over the Kond as well as their female ethnic counterparts. Santhal males, as member of a dominant ethnic group, come in considerable contact with the world outside their own and they are accustomed with different acculturating situations.

In India, Pandey (1970) administered EFT to 70 male and 70 female undergraduates and reported the males to be significantly more field independent. Sinha (1980) conducted a study on sex differences in cognitive styles among different cultural groups. He found that sex differences in cognitive styles did not occur consistently among less acculturated nomadic groups. He found that male and female differences were small and insignificant among the transitional Birhor and agricultures Orans, Urban boys were, However, significantly higher on field independence than girls.

Some studies did not report significant sex differences on the field dependence-independence dimensions. Other studies by DeFazio, (1973) and Taylor (1977)

reported no significant difference between the sexes on the field dependence-independence dimensions. Sandeep and Puspa (1981) found that there were no significant sex differences in cognitive styles. Sharma and Ahuja, T. (1982) Found that boys were more field independent than girls. Pandey and Pandey (1985) found that males were more field independent.

Sinha (1980) reported in one study in which boys and girls from tribal and non-tribal samples were tested and compared for their SPEFT performance. Analyses revealed that there were no sex differences in the tribal sample. On the other hand there were clear-cut differences in the urban sample at all the three age levels tested (4 to 5, 7 to 8, 9 to 10 years). It was concluded that in non-complex and stratified societies, distinct sex roles were culturally prescribed, and there led to differing psychological outcomes.

In this way, the origins of these differences have not been easy to establish, but, as Cattle (1971) has suggested in interpreting sex differences in abilities, one has to consider: first, maturational differences, genetically determined in neurology and hormone balances, and second, culturally produced differences through training for specified roles and ego ideals and third, systematic differences in opportunity. (p.131).

The issue of sex differences in cognitive style is a complicated one, not only because of the neurological factors involved but also because of the socio-cultural factors involved.

2.8 Summary of the Review

The review of literature on effect of culture-tribal and non-tribal, schooling and non-schooling and background variables -age, gender and socio-economic status etc. shows that these factors are important to affect the cognitive planning of children.

It is seen that education and culture both affect the cognitive planning. Most of the studies show that there is a significant difference in the cognitive functioning of the tribal and non-tribal children. These studies reveals that home environment affect the children's cognitive functioning. Lacks of interaction with adults, lack of stimulating environment etc. are the main cause of poor performance on cognitive task of tribal children.

Studies on effect of schooling shows that children who goes to school, get opportunity to enhance their reading and writing skills which affects their cognitive planning.

Background variables also effect the cognitive planning of children. Studies on development of planning show that older children are good planners than younger one. In this way, the efficiency of planning is increased as age increasing. Studies on SES, shows that high SES subjects performed much better than low SES subjects.

Thus, it is seen that culture (tribal and non-tribal), education and background variables affect the cognitive planning.

2.9 Conclusion

The review indicated a good number of studies on tribal-non-tribal and schooled-unschooled children's cognitive functioning. Some of the gaps had been found that justify the design of the present study.

Firstly, most of the studies discuss more about cognitive abilities rather than cognitive processing. Secondly, there were some methodological difficulties also as for example a) Tasks are not culturally fair and b) there is a tendency to treat Piagetian tasks as standardized performance test. Thirdly, difference in performance, favoring schooled children may be partly attributable to their familiarity with such procedure or task. Fourthly, there are almost no studies,

which looked at the nature of work, which might play an important role in cognitive development of unschooled tribal children. Fifthly, planning tasks are usually measured by reaction time. Strategy of doing planning task is also important.

Thus in an effort to fill some of the gaps, the present study was designed to assess the impact of education and culture on cognitive planning.

Chapter-3

Methodology

3.1 Problem Statement

Education and Culture affect the cognitive planning of children (8 to 10 years age group). Following are some of the assumptions on the basis of which objectives and hypothesis of the study are formulated.

3.2 Assumption

1. It is assumed that deficit in home environment affects the cognitive planning of tribal children.

Rationale: Home and its conditions in terms of over-crowding i.e. space available to each member of the family, toys, pictorial and cultural materials in the home, technological devices used for general living and the like would constitute the most important visible influence on the children's cognitive planning. J.P. Das and Singha (1975) found that lack of parental interaction and lack of verbal commerce with adults affect children's cognitive functioning.

A close examination of the day-to-day life of the disadvantage child reveals that he/she might be really over stimulated and overindulged by adults, neighbour or peer groups etc. One may suppose that it is not stimulation per se but the quality of stimulation that is important. The non-tribal child most often has superior quality of both verbal and non-verbal stimulation. The reinforcement systems in non-tribal families are of a delayed kind which is congruent to adult life; and certainly the verbal milieu in which the non-tribal child grows up corresponds much more closely to that found in academic textbooks and in school learning. All in all,

language is given a very important role as a determinant for the growth of intellect. These stimulations are distinct and affect the cognitive planning.

2. It is assumed that schooled children may perform better than unschooled children in successive as well as in simultaneous processing.

Rationale: In simultaneous processing, the individual codes the information simultaneously, such as in copying a geometrical figure or finding the missing piece of a pattern. Successive processing comes about when the individual is asked to repeat sentence he/she has just heard, to order objects in a sequence, or to tell a story immediately after he/she has heard it. These two processes are basic to any human behavior and come into play as the individual begins to understand his environment. In earlier research (Cummins and Das, 1977), simultaneous and successive processing has been related to reading, writing, and verbal comprehension. These skills are fostered in the first few years of schooling. Through successive years of schooling experience, the difference between the schooled and unschooled groups became increasingly wider in favour of successive and simultaneous processing.

In school, learning of a concept begins with a verbal formulation of a general rule. Over the course of time, the student connects this general rule with empirical referents. So it is not surprising to find that school children give a more adequate description of the rules of problem solution than to their non-schooled counterparts (Scribner and Cole: 1973).

In school children learn the alphabet, and learn to write letters and words. The skills required for writing letters involve analyses of the letter patterns and subsequent reproduction of these patterns. One important aspect of the letter writing skill is the child's simultaneous grasp of the structural components of the

letters, which through extended practice imparted in schools improves gradually. A failure in this skill results in confusion, which is noticed, for example, in English language when a child confuses between the letters 'b' and'd'. Gradually, the child learns to connect letters to form meaningful words, words to form sentences, and then uses sentences to construct small paragraphs to embed a stream of thought in a temporal order. Thus following the initial acquisition of printing and recognizing alphabets, the skill mostly in demand is decoding which requires successive processing (Cummins and Das, 1977). Beyond the initial stage of reading, as the child becomes aware of the semantic as well as the syntactic aspects of sentences and as comprehension is increasingly demanded of the child relational analysis or simultaneous processing assumes an increasingly important role (Kirby and Das, 1978). Thus the development of simultaneous processing is also facilitated by schooling as well.

3.3 Objective

1. To study whether tribal and non-tribal children differ in their cognitive planning.
2. To examine the cognitive planning of schooled and unschooled tribal and non-tribal children.

3.4 Hypotheses

1. There will be a significant difference in tribal and non-tribal children cognitive planning.
2. Schooled and unschooled children will differ significantly in cognitive planning.

3.5 Research design

The present study consists of an exploratory research design. The aim of the present study is to explore not only independent effect but also the interaction effect of culture and schooling on cognitive planning in reference to tribal and non-tribal children. There are two phases in the study-

First Phase: In the first phase, the researcher examined the social life of tribal and non-tribal groups. In other words, this phase broadly covered family size, educational status, occupational status, and child-rearing practices of tribal and non-tribal groups.

Second Phase: After this, different cognitive tasks have been used for measuring cognitive planning of tribal-non-tribal and schooled-unschooled children. The aim is to examine the cognitive planning strategy of different cultural group children who are going to school and those who are not going to school.

3.6 Variables

Categorical Variables

(1) Culture:	Tribal children
	Non-tribal children
(2) Education:	Schooled children
	Unschooled children

Culture: The present study consists of both the cultural groups-tribal as well as non-tribal children. Culture appears in people's perceptions, beliefs, values, norms, customs, and behaviors as well as in objects and the physical environment. The concept of culture indicates ways of behaving and relating to the environment. It is possible to understand how different aspects of culture affect and is affected by the

physical environment. Recognizing the importance of environmental variables, Sinha (1981, p.27) comments, "The nature of environment provides the necessary inputs, stimulation, and experiential base for the development of perceptual skills of various kinds." In addition, an overt behavior that helps to achieve primary and to control territories, migrations use of land and so forth act in relation to the environment.

Education: The present study consists of primary level i.e. third standard children from both the groups (tribal and non-tribal) of same age group 8 to 10 years. The age of the unschooled children is also same as that of the schooled children.

In several studies, it has been found that schooling facilitates the cognitive planning of children. In some way, schooling promotes cognitive development. It is also found that education gives knowledge, not cognitive skill; so the cognitive development is not totally dependent on schooling. Environment stimulation also plays an important role in children cognitive development. The school environment is equal for both the groups (tribal and non-tribal schooled children). The sample has been taken from three schools.

Measured Variables

Cognitive processing

The present study is based on J.P. Das model. According to this model there are three processing unit---

Simultaneous processing: In simultaneous processing, the individual codes different pieces of information simultaneously, such as in copying a geometrical figure or finding the missing piece of a pattern. This process involves the integration of stimuli into groups, or the recognition that a number of stimuli share common characteristics. Both of these aspects require that all the stimuli be related to one another.

Successive processing: It involves the integration of stimuli into a particular series where the elements form a chainlike progression. The critical aspect of successive processing is that elements must be ordered without surveyablity.

Planning: According to Das (1984) planning involves the aptitude for asking new questions, solving problems, and self -monitoring as well as the application of information coding processes. The generation, selection, and execution of plans are the three main aspects of planning.

Matching Variables

The samples were matched on age and socio-economic status.

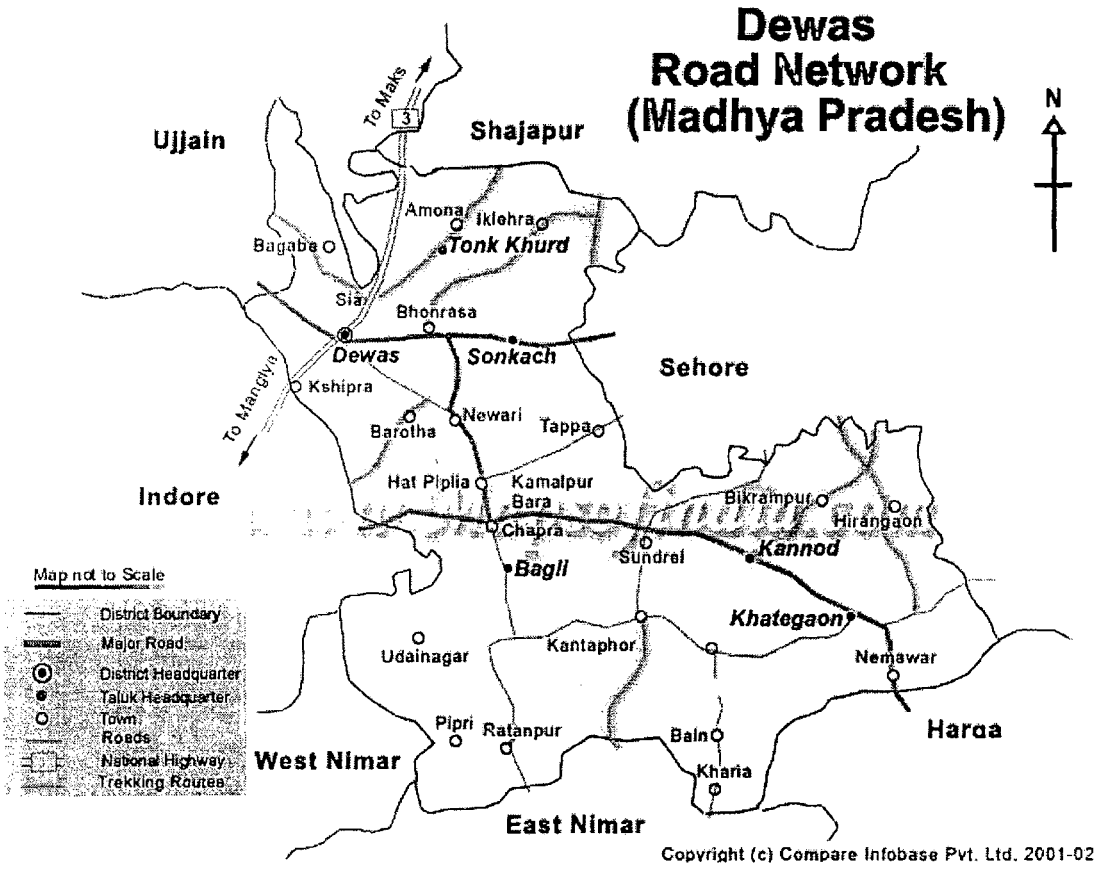
Age: Eight to ten year old children were purposively sampled for this study. In several studies, it has been found that the major cognitive tools for planning are acquired between the ages of 5 and 12 years. Before 5 years, action may not yet be sufficiently controlled to allow for enough experience with planning, whereas after 12 years, children already have so many stored plans and programs that planning (i.e. plan formulation) is not necessary.

Socio-economic status: Socio economic status in this study includes parent's education, parent's occupation, income level etc. In several studies, it has been found that socio economic status also determines the cognitive processing of the children.

3.7 Sample

The purposive sampling technique has been used in this study. The age group of the sample was eight to ten years old children. The reason is that it has been found in several studies that before 5 years, action may not yet be sufficiently controlled to allow for enough experience with planning, whereas after 12 years, children already

have so many stored plans and programs that planning (i.e., plan formulation) is not necessary. The sample in this study has been taken from three villages of Dewas District from Madhya Pradesh. These villages consist of both tribal and non-tribal community people.



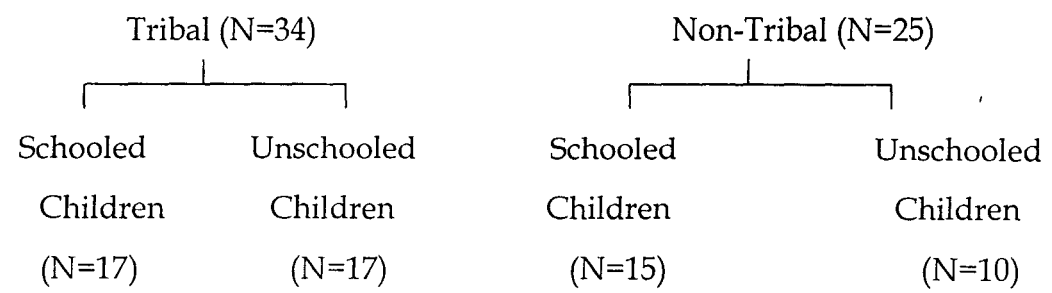
According to 1991 census the detail of these villages are as follows-

Village	Population				Literacy	
	Male	Female	% Tribal	% Non-tribal	% Males	% Females
Bheekupura	541	529	36%	64%	36%	15%
Soblyapura	393	381	84%	16%	26%	12%
Neemkheda	380	366	88%	12%	31%	5%

Source: 1991 Census of Dewas District M.P.

As the table shows that the male and female population in Bheekupura is 541 and 529 respectively. This village consists of 36% of tribal population and 64% of non-tribal population. The literacy rate in this village is 36% among males and 15% among females. Soblyapura, which is very close to Bheekupura, and Neemkheda, consists of 393 numbers of males and 381 females. In this village tribal population is 84% and non-tribal population is 16%. The literacy rate among males is 26%. The female literacy rate is 12%. The third village is Neemkheda, which consists of 380 males and 366 females. The percentage of tribal and non-tribal population is 88% and 12% respectively. In this village male literacy rate is 31% and female literacy rate is 5%.

These villages consist of both of tribal and non-tribal people. Tribals in these villages belong to Bhilala tribal community. This community is the sub group of Bhil tribe. Several Bhilala families hold estates in Malwa and Nimad and their chiefs now claim to be pure Rajputs. In Madhya Pradesh, the population of the Bhilala is above 10,000. The details of the sample is as follows-



Where N stands for number.

As the flow chart shows that there are two cultural groups- Tribal and non-tribal. These two groups consist of both schooled and unschooled children. The size of the sample is 59. The number of tribal children is 34 out of which 17 are schooled and

17 are unschooled children. The number of non-tribal children is 25 out of which 15 are schooled and 10 are unschooled children.

3.8 Tools

The following tools were used for the study-

Raven's Progressive Matrices

This is a culture free test. It is a test of intellectual (non-verbal) reasoning for children aged 5 to 11 years, consisting of 36 matrices or designs, each having a part, which has been removed. The task of the child is to decide the missing part and insert it from six possible alternatives given below. The child has to simultaneously evaluate and search all the six possible alternatives in order to find out the correct portion. The 36 matrices are grouped into three series, each comprising of 12 matrices having increasing difficulty. The earlier series require accuracy of discrimination, while the latter series involve analogies, permutations and alternations of the pattern, and other logical relations. Das, Kirby and Jarman (1979) had used this test as a good measure of simultaneous processing. There was no time limit, as he/she needed to complete the matrices.

Memory for Design

This test was originally derived from Graham and Kendall (1960), and has been identified as a stable market test of simultaneous processing. It consisted of 15 simple straight-line designs, each of which was shown to the subject for a 5 seconds viewing period. The subject was then required to reproduce the designs from which were scored 0, 1, 2, or 3 depending on the correctness of reproduction. The maximum possible score is 43, in which the subject reproduced fifteen simple straight line design from memory after each one was shown for a five-second viewing period.

Digit Span

This is a successive marker test and is abstracted directly from the WISC. Digits of increasing length were read out to subjects who were required to recall the digits in correct serial order. The subject's score was the number of digits in the series of maximum length recalled correctly.

Word Recall

This is a marker test of successive processing. The test consisted of 12 lists of words, four from each of four-letter word, five-letter word and six letter word series. The subject was asked to recall each series in correct serial position constituted the serial recall score of the subject.

Visual Search

This test was originally identified as an appropriate measure of planning by Ashman (1978) and Das (1980). The test consisted of seven tests and one practice card. At the center of each card was an encircled target pattern which appeared only once in a field of many distracting patterns surrounding the target. The subject was instructed to take note of the target pattern, which may be either a number or picture and to find in the distracting field, the one that resembled the target pattern. The time taken by the subject to find out the pattern constituted the visual search score.

Planned composition

This verbal marker test of planning requires subject to write a story after seeing a picture card, which is card No. 2 of the Thematic Apperception Test (TAT). The stories written by the subjects were rated by the experimenter for organization, expression, and individuality. The experimenter gave a score between 1 to 7 to indicate his evaluation of the story, ranging from poor to good in each of the three criteria. The maximum possible score for this test is 21.

3.9 Pilot Study

A pilot study was conducted at the planning stage of research in order to identify some directions for the formulation of the problem itself in a scientific manner. Additionally, it also helped in sample size, finalizing testing of the tools and time involved in testing etc. The sample for the pilot study consisted of primary school children of classes second and third (age group 8 to 10 years) studying in the Dewas District, Madhya Pradesh. The school consists of both tribal and non-tribal children, so the school setting is kept constant for all the subjects of the study. All the tribal subjects belonged to the Bhilala tribal community.

The sample was drawn in the following way for the pilot study.

The Sample Representation of Different Groups.

Tribal		Non-tribal		Total
Schooled	Unschooled	Schooled	Unschooled	
5	5	5	5	20

Tools:

The following tests were administered --------

1. RCPM.
2. Memory for Design.
3. Serial Recall.
4. Digit Span.
5. Visual Search.
6. Planned Composition.

The first two test were used for measuring simultaneous processing, the third and fourth were for successive processing. Last, two were used for planning.

Findings of the pilot study

The researcher had faced some difficulties with the tools, because of some of these were not very culturally fair for tribal children. Non-tribal children were more aware of the test contents than the tribal children. The researcher didn't find any difficulty while applying the test of RCPM, Digit Span, Memory for Design and Visual Search. But test like serial recall and planned composition, which did not yield accurate result because of the items not being familiar to tribal children. In planned composition test, the tribal children didn't respond because of the shyness and verbal incompetence.

As the researcher came across above difficulties in the serial recall and planned composition test, she made appropriate modifications. First, modification was made in Serial Recall test. In the original test, there were three lists having four words each. The first list had four letters word, second had five letters word and third had six-letter word. In the pilot study, it was found that subjects recalled four words in each series very quickly. Moreover, the expected differences could not be seen. But when she changed the original test to contain tool list with six words each, first list, having two letters word and second, having four letter words. With this modification, the researcher got some differences in the performance of children in the pilot study. The researcher in the planned composition task made the second modification. As the sample contained both the schooled and unschooled children, writing a story was not possible for unschooled children. The second problem was encountered while administering the TAT story card. Tribal children could not narrate the story on seeing the TAT story card. The researcher felt the problem could be due to lack of exposure to verbal tasks.

Due to above difficulties, the researcher preferred to use Sentence Making task instead of Planned Composition task. In Sentence Making Task, subjects are asked

to make as many sentences as they can on the given words like 'Home'. It was made sure that words are chosen from their environment and equally familiar to both the groups (Tribal and Non-tribal). Following criteria were used to analyze the sentences, constructed by the subjects-

a) Have a good starting point, b) systematic, c) have connection with the other sentences etc.

In a way the researcher found out what type of strategies are used by the different cultural groups (tribal and non-tribal group).

3.10 Procedure

The subjects were tested individually in one session. The schooled children were tested in separate rooms provided by the Headmasters of respective schools. The unschooled children were tested in their locality. The testing session began after establishing adequate rapport with the subject. All the tasks were administered in the order they have been described in this section.

3.11 Data analysis

Data were analyzed by using both quantitative and qualitative techniques. Analysis of quantitative data was done using t-test and Chi-Square tests. To measure successive processing-Word Recall and Digit Span tasks, t-test has been applied. T-test showed the mean difference of performance in terms of score obtained by the subjects on Word Recall and Digit span tasks. Chi-test has been applied to measure the performance of subjects on Memory for Design and on Planned Composition tasks. Chi-test showed the frequency of response of the subjects on these tasks. The qualitative analysis was used for Raven's Progressive Matrices, Visual Search, and Planned Composition task. The qualitative information on classroom observations and conversations with parents, children and teachers were content analyzed to support the quantitative findings and to add the richness of the study.

Chapter-4

Result and Discussion

This chapter is divided into three sections. The first section throws light on the socio-cultural milieu of the sample. This section describes the distinctive features of tribal and non-tribal of three villages - Bheekupura, Neemkheda and Soblyapura- under study. This section broadly covers family size, educational status, occupational status, and child rearing practices of tribal and non-tribal groups.

As mentioned in the last chapter this study uses different cognitive tests like Word Recall, Digit Span (successive processing), Memory for Design, RCPM (Simultaneous processing and Visual Search and Planned Composition tasks (planning). The Second section deals with the findings and their interpretation of different cognitive tasks. The last section depicts the general discussion of the findings.

Section-I

Socio-Cultural Milieu of the Village

The present study has been conducted in Dewas district, M.P. In Dewas district some villages which have both tribal and non-tribal population were selected. The data has been collected from the three main villages - Bheekupura, Soblyapura and Neemkheda. These three villages more or less matched as far as general life style, economic development, social environment and school environment were concerned. The area of Bheekupura is 496.10 Ha. The population of the village is 1070, out of which men are 541 and women are 529. This village has a 36% of tribal and 64% of non-tribal population. Literacy rate among men is 36% and among women is 15%. The area of Soblyapura is 328.20 Ha. The village population is 774, in which the number of men and women are

393 and 381 respectively. This village consists of 84% of tribal and 16% of non-tribal. Literacy rate among men is 26% and among women, is 12%. The area of Neemkheda is 743.78 Ha. The population of the village is 746, out of which the total numbers of men are 380 and women are 366. This village consists of 88% of tribal people and 12% of non-tribal people. Literacy rate of the village is 31% among men and 5% among women. Total literacy rate is 18%.

The following is the details of the social life of the sample.

Family Size

The tribal community has a joint family system. They get married at the early age of 15 or 16 years. They do not use any modern methods of family planning. They are in favor of many children so that they can get economic support to the family. In each family, it is found that they have at least 5 children. The family structure is patriarchal. The head of the family is generally the father or any male member in the absence of the father.

In non-tribal families, family size is generally smaller than the tribal family. They also have a patriarchal system. The head of the family is the male member only. The head of the family was found to have knowledge of family planning methods.

Occupational status

Observation showed that most of the tribal people have a small piece of land, which they cultivate. Male and female members work together. Others who do not have land go for daily work on daily wage basis. Their children also work at field and go for cattle grazing to the forest.

In non-tribal community, most of the families have their own land; some of them work as shopkeepers, drivers, and peons or work for daily wages. The female members also work as agricultural labourers.

Income of the family

Although most of the tribal people have land, their income is very low. They do not have proper sources for irrigation. This area is almost a draught prone area. Non-tribal people also have more or less same income level as tribal people have

Educational status

The educational status of the tribal families is very poor. Most of the children's parents are illiterate. The literacy percentages of tribal population in the three villages are 26% (Bikupura), 19% (Soblyapura) and 18% (Neemkheda). Male literacy rate is higher than female literacy rate.

The literacy rate is higher among non-tribal as compared to the tribal. In most of the families, male members are literate. The non-tribal women also have same level of education. They are in favor of their children's education but do not have time to look after their children's education

Housing patterns and facilities

All the houses in the tribal community are designed in a very traditional way. These houses have thatched roof. They have only a big room with several partitions. At one corner, they have the kitchen, at another storeroom, bedroom and bathroom etc. All these houses are very small. Tribal maintain a simple life. They use aluminum and earthen utensils. Most of the families have two/three chickens. Some of the families have cows, buffaloes, goats and oxen.

Housing patterns of the non-tribal are very different to that of the tribal. They have more than one room in their houses. Most of the houses are made of wood and bricks. They have brass and steel utensils.

Reading Time

The tribal children, who are going to school, do not read at home. After school hours most of the children work in the fields. In non-tribal families, children are encouraged to read at home. Study related materials like newspaper, magazines etc. are available in the home. They are also encouraged to do extra curricular activities like drawing figures, cutting and pasting pictures. In most of the families, parents interact with their children during such learning activities.

Childcare and other habits (eating, drinking etc)

In the tribal community, childcare is the responsibility of the female members. They are not much bothered about their cleanliness. Children have adequate interaction with their peer groups and elderly peoples of the village. All the family members take food together. The drinking habit is very common in all families. All the members of the family including male, female and children take 'Mahuya', a hand made alcoholic beverage in the night. They have a strong opinion about its positive impact for the health of the human body. They believe that this alcohol helps them get rid of several diseases.

In the non-tribal community, childcare is the responsibility of both the members male as well as female. Parents are very much concerned about their children's cleanliness. Children have more interaction with their parent's then tribal children.

Non-tribal people do not take 'Mahuya'. In some of the families, male members take 'Desi Sharab'. Like tribal people, they do not give it to females and children.

Language

The tribal mother tongue is Nimadi. They understand Hindi to some extent due to their interaction with non-tribal people and because this language is similar to Hindi. The mother tongue of the non-tribal people is 'Hindi'. However, they usually speak 'Nimadi', which is very similar to Hindi.

Activities of the family members

All the family members usually get up early in the morning. Both male and female members go to field or other places for work. They take their lunch at home. Then again, go back to work and return to their homes at about 6.30 p.m. Non-tribal peoples daily activities are similar to tribal people.

Activities of the children

Children, who are not going to school, go to the fields and forest for work. Early in the morning, they take the cattle to the forest to graze. Girls, do work at home, they help their mother in household activities. They also look after their younger siblings. Children who go to school also help their parents in several ways. After school hours, they go to fields. Girls help their mother in the house chores. Younger children, who do not have any responsibilities, spend most of their time playing. Mostly children in non-tribal family spend their time in reading and playing. Those who do not go to school go to the paddy fields or forest for work.

Section-II

Result of the cognitive tasks

Successive Processing

To measure successive processing of the respondents, two tasks- Word Recall and Digit span have been administered to the subjects. In order to examine the differences between tribal and non-tribal and schooled and unschooled children performance on Word Recall and Digit Span tasks, the't' test has been applied. The responses of the subjects are shown in the following table-

Table-4.1

Summary of Mean, Standard Deviation and T-Test Value on Word Recall Task of Tribal-Schooled and Unschooled Children and Non-tribal- Schooled and Unschooled Children.

Groups	N	Mean	SD	d.f	't' values
TSC	17	9.12	1.01	32	2.33*
TUSC	17	7.23	1.59		
NTSC	15	10.7	0.84	23	2.72**
NTUSC	10	9.2	0.89		

*p<.05, **p<.01.

Tribal Schooled Children (TSC, henceforth).

Tribal Unschooled Children (TUSC, henceforth).

Non-tribal Schooled Children (NTSC, henceforth).

Non-tribal Unschooled Children (NTUSC, henceforth).

Table- 4.1 reveals that the effect of schooling on performance on Word Recall task was found to be significant in case of tribal children (t= 2.33, p< .05) indicating that schooled children (M=9.12) performed much better than unschooled children (M= 7.23) on Word Recall task.

Similarly, in case of non-tribal children, it was found that the effect of schooling on performance on Word Recall task was significant (t= 2.72, p< .01). Mean difference showed that non-tribal schooled children (M= 10.7) performed much better than unschooled children (M= 9.2). The above results indicate that schooling has a significant effect on Word Recall task.

Table-4.2

Summary of Mean, Standard Deviation and T-Test Value on Word Recall Task of Schooled- Tribal and Non-tribal Children and Unschooled- Tribal and Non-tribal Children.

Groups	N	Mean	SD	d.f	't' values
TSC	17	9.12	1.01	30	2.82**
NTSC	15	10.7	0.84		
TUSC	17	7.23	1.59	25	3.51**
NTUSC	10	9.2	0.89		

*p<.05, **p<.01.

Table-4.2 reveals that the effect of culture on Word Recall task was found significant (t= 2.82, p< .01). The result indicated that tribal schooled children (M=9.12) performed less well on Word Recall task, while non-tribal schooled children (M=10.7) performed better on Word Recall task. This indicates that non- tribal schooled children performed much better than tribal schooled children.

Similarly, in case of unschooled children, effect of culture on Word Recall task, was found significant (t=3.51, p< .01). As the mean difference showed that tribal unschooled children (M=7.23) respond less, while non-tribal unschooled children (M=9.2) respond well to the Word Recall task. This indicates that there is a significant effect of schooling as well as culture on Word Recall task.

Table-4.3

Summary of Mean, Standard Deviation and T-Test Value on Digit Span Task of Tribal- Schooled and Unschooled Children and Non-tribal- Schooled and Unschooled Children.

Groups	N	Mean	SD	d.f	't' values
TSC	17	7.59	1.49	32	6.25**
TUSC	17	4.41	1.36		
NTSC	15	9.33	0.87	23	4.63**
NTUSC	10	6.0	1.34		

*p<.05, **p<.01.

Table-4.3 shows the result of Digit Span task on successive processing. Results indicated that the effect of schooling on Digit Span task was to be found significant (t=6.25, p< .01), indicating that tribal schooled children (M=7.59) performed much better than tribal unschooled children (M=4.41) on Digit Span task.

Similarly, in case of non-tribal children's performance on Digit Span task, it was found that schooling has significant (t=4.63) effect on Digit Span task. Non-tribal schooled children (M=9.33) performed significantly better than unschooled children (M=6.0). In other words schooling seems to have been providing some benefits in area of cognitive functioning.

Table-4.4

Summary of Mean, Standard Deviation and T-Test Value on Digit Span Task of Schooled- Tribal and Non-tribal Children and Unschooled- Tribal and Non-tribal Children.

Groups	N	Mean	SD	d.f	't' values
TSC	17	7.59	1.49	30	2.29*
NTSC	15	9.33	0.87		
TUSC	17	4.41	1.36	25	2.84**
NTUSC	10	6.0	1.34		

*p<.05, **p<.01.

Table-4.4 shows that the effect of culture on Digit Span task was significant (t=2.29, p< .05). Since the mean difference showed that non-tribal schooled children (M=9.33) performed well on Digit Span task, whereas tribal schooled children (M=7.59) performed less well on Digit Span task. This indicates that there is a significant effect of culture on Digit Span task.

Similarly, in case of unschooled children, the effect of culture on Digit Span task was found significant (t=2.84, p< .01). There was a significant mean difference between tribal unschooled children (M=4.41) and non-tribal unschooled children (M=6.0). This indicates that non-tribal unschooled children performed much better than tribal unschooled children.These findings clearly indicate that there is a significant effect of schooling as well as culture on successive processing tasks (Word Recall and Digit Span).

Discussion

The result shows that schooled children performed much better than unschooled children on both the tasks (Word Recall and Digit Span) of successive processing. These results supports PASS model (Das, 1973) in which

it is said that too much of emphasis in the school system on rote memory at the earlier grades possibly helps developing successive coding more than visual analysis and organization of ideas which are primarily responsible for simultaneous and planning functions respectively. In schools, children learn to connect letters to form meaningful words, words to form sentences, and then use sentences to construct small paragraphs to embed a stream of thought in a temporal order. Thus, following the initial acquisition of printing and recognizing alphabets, the skill mostly in demand is decoding which requires successive processing (Cummins and Das, 1977). At this stage, the child also acquires deliberate remembering devices, and begins to develop awareness of a formal linguistic structure- an opportunity which is relatively lacking in the non-school child's environment. In this way, successive processing is probably developed through rote repetition of the curriculum, and there is minimal addition to this until about grade seven. So successive processing develops much faster in schooled than in non-schooled children. In other words, it can be concluded that schooling facilitates the successive processing. These results supports earlier findings by Rogoff (1981), who suggested that school is probably one of the few environments in which one has to deliberately remember information as a goal in itself.

As the results show, the tribal and non-tribal children differed significantly in successive measures (Digit Span and Word Recall). The non-tribal children performed better in both the tasks compared to their tribal counterparts. The good performance of non-tribal children may be due to the better home environment and parents interaction. Sinha (1994) has also stated in this context that display of low performance on a variety of tasks does not reflect any basic deficit in abilities; rather they are primarily due to impoverished environmental circumstances. In the present study, although the tribals and non-tribals were living in the same area the non-tribal home environments were found to be much more stimulating in terms of verbal interaction, encoding and rehearsal. It has been stated by Welch- Ross (1997) that parents who use an 'elaborative' style

provide detailed descriptions of events, including a great deal of background and orienting information their children develop successive processing skills better. They preface questions with detailed prompts and follow up children's independent recall with questions that further the conversation. In comparison with more elaborative parents, parents who use a 'repetitive' or 'restricted' style tend to differ less in contextual background information. Their study indicated that mother's elaborations influence directly both the information children recall in conversation and the development of representational skills.

Simultaneous Processing

To measure simultaneous processing of the subjects, two tasks were used. These are - Ravens Progressive Metrics and Memory for Design.

Memory for Design

This task consists of 15 geometric designs. The task of the subject is to draw these deigns. The following table shows subjects response on this task-

Table-4.5

Summary of Chi-test on Memory for Design Task on Tribal-Schooled and Unschooled Children and Non-Tribal-Schooled and Unschooled Children.

Schooled/ Unschooled	Tribal /Non tribal children	Below	Average	Good	d.f.	Chi-test Value
Tribal	Schooled Children	1	8	8	2	25.18**
	Unschooled Children	8	8	1		
Non-tribal	Schooled Children	1	5	9	2	4.25
	Unschooled Children	1	7	2		

*p<.05, **p<.01.

Table-4.5 presents the performance of schooled and unschooled children of both the groups (tribal and non-tribal) on Memory for Design task. As the table depicts that out of 17 tribal children one child performed at below the average level, eight children performed at average level and eight children performed at high level. Whereas the performance of unschooled children on this task was as follows- eight children at below average level, eight children at average level and one child at high level. The chi-test value (25.18) of the distribution was found to be statistically significant at .01 level.

Among non-tribal schooled children the performance on Memory for Design Task was as follows- one child performed at below the average level, five children performed at average level, and nine children performed very well. Whereas non-tribal unschooled children performed as follows- out of 10 children one child performed at below the average level, seven children performed at average level and two children very well. The chi-test value (4.25) was found insignificant at .05 level. The result revealed that there is no significant difference between non-tribal schooled children and unschooled children on Memory for Design Task.

Table-4.6

Summary of Chi-test on Memory for Design Task on Schooled- Tribal and Non-Tribal Children and Unschooled-Tribal and Non-Tribal Children

Schooled/ Unschooled	Tribal /Non tribal children	Below	Average	Good	d.f.	Chi-test Value
Schooled	Tribal Children	1	8	8	2	1.28
	Non-tribal Children	1	5	9		
Unschooled	Tribal Children	8	8	1	2	4.72
	Non-Tribal Children	1	7	2		

*p<.05, **p<.01.

Table-4.6 presents the cultural effect on Memory for Design Task. The performance of tribal schooled children on Memory for Design as follows- one child performed at below the average level, eight children at average level and eight children at high level. Whereas out of 15 non-tribals schooled children one child performed at below the average level, five children at average level and nine children at high level. The chi-test value (1.28) was found insignificant at .05 level. There is no significant difference between tribal and non-tribal schooled children performance on Memory for Design Task.

Out of 17 unschooled tribal children, eight performed at below the average level, eight children at average level and one child at high level, whereas out of 10 unschooled non-tribal children one performed at below the average level, seven

at average level and two at high level. The chi-test value (4.72) was found insignificant at .05 levels. The result revealed that there is no significant difference between unschooled tribal and non-tribal children performance on Memory for Design task. In this way, there is no cultural effect on Memory for Design task because tribal and non-tribal children performed at equal level, whereas schooled children performed much better than their unschooled counterparts.

Raven's Coloured Progressive Matrices

This is a culture free test. This test consisted of 36 matrices or designs, each having a part, which has been removed. The 36 matrices are grouped into three series, each comprising of 12 matrices having increasing difficulty. Das, Kirby and Jarman (1979) had used this test as a good measure of simultaneous processing.

Result

Raven's Coloured Progressive Matrices was a non-verbal task. The researcher observed that tribal and non-tribal children responded on this task equally. She also found that although schooled and unschooled children performed on this task equally yet schooled children took less time than unschooled children of both the groups (tribal and non-tribal) on this task.

Discussion

The results revealed that schooled children performed better on both the tasks-Memory for Design and RCPM. Although statistically, there is no significant difference between non-tribal schooled and unschooled children performance on Memory for Design task observation revealed that non-tribal schooled children performed much better than unschooled children. This result supports J.P. Das model in which it is said that school subjects like geometry, mathematics, and language arts emphasize the perception of logical relationships, which facilitates simultaneous processing. It is also said that beyond the initial stage of reading,

as the child becomes aware of the semantic as well as the syntactic aspects of sentences, and as comprehension is increasingly demanded of the child, relational analysis or simultaneous processing assumes an increasingly important role (Cummins and Das, 1978). Thus schooling as well facilitates the development of simultaneous processing as well.

The observation shows that tribal and non-tribal, schooled and unschooled children more or less performed same on Raven's Coloured Progressive Matrices. This task is a non-verbal task. The results on this task may be explained by the fact that "language is an important 'cognitive tool'" (Vygotsky, 1982). Since RCPM is a non-verbal task, schooling effect was not significant and unschooled children performed as well as schooled children.

The result that there is no effect of culture on Memory for Design and RCPM tasks may be explained by the fact that both tribal and non-tribal sample were matched on major socio-economic factors indicting and also were drawn from the same environment. Bronfenbrunner's, ecological model shows that three factors home, school and peer groups with physical facilities, nature of social interactions and activities common in each constitute the most important ecological influences on the psychological development of the child (Durganand Sinha, 1977, p.116). Since tribal and non-tribal children belong to the same social settings, this probably reduced the impact of culture on their performance on cognitive task. The other reason may be is that now a days media such as television, tape-recorder, radio etc. increase awareness among the people and therefore brings the so called backward communities at par with those who had otherwise better access to information. This could be the main reason why tribal children performed more or less like non-tribal people. It may also be said that schooling further bridges the gap.

Planning

To measure planning of the subjects two tasks were used-Visual Search Task and Sentence Composition Task.

Visual Search Task

This test consisted of seven tests and one practice card. At the center of each card was an enriched target pattern which appeared only once in a field of many distracting patterns surrounding the target. The subject task was to take note of the target pattern, which may be either a number or picture and to find in the distracting field, the one that resembled the target pattern.

Result

The performances of the tribal and non-tribal schooled and unschooled children are as follows- The observation shows that there is no schooling as well as cultural impact on Visual Search task. Automatic search was faster than controlled search in both the groups (tribal- schooled and unschooled and non-tribal schooled and unschooled children). Field density affected both the groups' performance in controlled search but not in the auto-search condition. It was observed that subjects searched the stimuli systematically (horizontally or vertically), not in a haphazard way on the controlled search tasks, whereas on auto-search task, they responded very quickly and in a haphazard way.

Sentenced Composition Task

This task required subjects to make some sentences on particular subject like - 'home'. The subject has to describe their home. After the content analysis of the respondents' response, four factors came out. The following table shows how many children response on each factor-

Table-4.7

Summary of Chi-test on All Four Factors of Sentence Composition Task of Non-tribal-Schooled and Unschooled Children.

Factor	Non-tribal Schooled Children	Non-tribal Unschooled children	Chi-test value
Household Things	88%	60%	10.34**
Animals	8%	50%	42.84**
Family Members	16%	8%	3.02
House design	100%	98%	2.02

*p< .05, ** p< .01.

Result Analyses

The Details of the respondents' response on five factors are as follows-

Chi-test was conducted to find out that how many children mentioned about household things when they were asked to describe the 'home'. As the table-4.7 revealed that the chi-test value (10.34) was found significant at .01 level. About eighty eight percent of non-tribal schooled children described 'home' through household things like T.V., Tape Recorder etc, whereas sixty percent of unschooled non-tribal children described 'home' through the household things like utensils or kitchen material like- pots, plates, etc. However, non-tribal schooled and unschooled children described the household things differently. Unschooled children gave more emphasis to the essential things in home, whereas schooled children's response shows that they included not only essential things but also other luxury things like T.V., Tape Recorder etc. It may

be assumed that because of schooling and home environment these children have broadened the home to include not only essential things but also luxury items.

The Chi-test value (42.84) was found significant at .01 level on the second factor 'animals'. About eight percent of non-tribal schooled children included animals when they described the 'home', whereas fifty percent of non-tribal unschooled children included animals in their description of 'home'. This result may be explained by the fact that most of the unschooled children gave more emphasis on animals because most of them are shepherds. They work with animals.

The Chi-test value (3.02) was found insignificant at .05 level. In the description of 'home', about sixteen percent of non-tribal schooled children included their family members, whereas the percentage of unschooled children who included family members in their description of 'home' is only eight. Although statistically there is, no significant difference was found yet the observation showed that schooled children gave more emphasis on family members than unschooled children did. In schools, children read in their textbooks about the role of their family members in their life and learn to talk about it, whereas unschooled children take this as something that is given. In addition, they lack the aptitude for producing responses in an approved format and just for the sake of reproduction. Beside, this should not be read as if they do not have much interaction with their family members.

On the house design dimension schooled and unschooled children both respond more or less similarly. Statistically, (chi-test value-2.02) it is also found that there is no significant difference between schooled and unschooled children response on the house design factor. They described their houses in this way-their houses are made of mud, wood, and bricks. Their houses are small etc.

Table-4-8

Summary of Chi-test on All Four Factors of Sentence Composition Task of Tribal-Schooled and Unschooled Children.

Factor	Tribal Schooled Children	Tribal Unschooled children	Chi-test Value
Household Things	92%	75%	10.48**
Animals	44%	33%	2.54
Family Members	44%	8%	33.68**
House design	75%	58%	6.46*

*p<.05, **p< .01.

Result Analyses

The Chi-test value (10.48) was found significant at .01 levels on household things dimension. About ninety two percent of tribal schooled children described 'home' through household things, whereas seventy five percent of tribal unschooled children included household things in their description of 'home'. This value reveals that tribal schooled children described more about the household things than tribal unschooled children did. Tribal schooled children described the household things like- T.V., Tape Recorder etc. while tribal unschooled children described home through utensils or other essential things like bed, chair etc and not through luxury items.

As the table-4.8 revealed that the chi-test value (2.54) was not significant at .05 levels on the second factor 'animals'. Similar number of tribal schooled and unschooled children mentioned about animals in their description of 'Home'.

This could be because the tribal schooled children also work with animals in the evening. Among tribal, each family was found to have one or two animals.

On the family member's dimension, the chi-test value (33.68) was found significant at .01 levels. As the table-4.8 shows that about forty-four percent of tribal schooled children described about their family members in their description of 'home', whereas only eight percent of tribal unschooled children mentioned their family members in the description of 'home'. The main reason may be that tribal schooled children see the pictures of home and read about the role of family members like mummy, papa, sisters and brothers etc. in their text books. One full chapter is devoted to family in the class one textbook. Tribal unschooled children also have same amount of interaction with their parents like tribal schooled children but they do not verbalize them. Beside, they are almost taken as given by unschooled children.

As the chi-test value (6.46) in the table-4.8 revealed that there is significant difference ($p < .05$) between the tribal schooled and unschooled children response on house design factor. About seventy five percent of tribal schooled children mentioned the house design in the description of 'home', whereas only fifty eight percent of tribal unschooled children described the house design in their description of 'home'. Tribal schooled children described their house design centered on whether their houses are made of wood, mud or bricks, whereas when unschooled tribal children described about their house design they emphasized that they themselves go to forest, cut the trees and bring them and make their houses. They also said that their houses are made of mud, wood and bricks. The description shows that tribal unschooled children described their house design in a very descriptive manner,. They described not only what type of material they used but also how they make their house. Whereas tribal schooled children described what type of material used in a house design. The reason could be that most of the unschooled children work in the forest. Most of them also help their parents in making their house. As the result revealed that

more number of tribal schooled children described about house design than unschooled tribal children but unschooled children mentioned house design in a more descriptive manner than schooled children.

Table-4.9

Summary of Chi-Test on All Four Factors of Sentence Composition Task of Schooled- Tribal and Non-tribal.

Factor	Non-Tribal Schooled Children	Tribal Schooled children	Chi-test Value
Household Things	88%	92%	0.88
Animals	8%	44%	23.66**
Family Members	16%	44%	12.66**
House design	100%	75%	28.56**

* p< .05, ** p< .01.

Result analyses

The details of schooled tribal and non-tribal children response on sentence composition task are as follows-

The chi-test value (0.88) was found insignificant at .05 levels on household things. As the table-4.9 shows that about eighty eight percent of non-tribal schooled children respond about household things whereas ninety two percent of tribal schooled children mentioned the household things in their description of 'home'. In the description of 'home', non-tribal schooled children described the household things like this- they have T.V., tape recorder in their home. They also described about utensils and other Kitchen materials. In the same way, tribal schooled children mentioned about the household things like this- they have bed, chair in their home. They also described about utensils and other

kitchen materials. In this way, both the groups' tribal as well as non-tribal schooled children described about their household items in the same manner.

As the table-4.9 showed that the chi-test value (23.66) was found significant at .01 levels on the second factor 'animals'. About eight percent of non-tribal schooled children described about animals in the description of 'home' whereas about forty four percent of tribal schooled children mentioned animals in the description of 'home'. The reason may be explained by the fact that in tribal family, the main occupation is agriculture and cattle gazing, whereas non-tribal people work on daily wages, as a driver or shopkeeper etc. In this way tribal children have much contact with animals. That is why they gave more emphasis on animals.

As the chi-test value (12.66) in the table-4.8 revealed that there is a significant difference ($p< .01$) between the tribal schooled and unschooled children response on house design factor. About sixteen percent of non-tribal schooled children mentioned about their family members, whereas about forty four percent of tribal schooled children spoke about their family members in their description of 'home'. The difference between the response of tribal and non-tribal schooled children on this dimension is attributable to the difference in the circle of interaction and their activity. In case of tribal children, they have a close knit society, where they have interaction with their family members and neighbours. Considering non-tribal , we find that they have wider circle of interaction ranging from family, peers to outside society. This could be the reason that more number of tribal schooled children included their family members in their description of 'home' than non-tribal schooled children.

The chi-test value (28.56) revealed the significant difference between tribal and non-tribal schooled children response on house design. All the non-tribal schooled children mentioned house design in the description of 'home' whereas about seventy five percent of tribal schooled children described the house design

in their description of 'home'. Observation shows that although tribal and non-tribal children described about the house design more or less in a same manner yet non-tribal children gave more emphasis on what type of material they used for making a house and how they made a house, whereas tribal children spoke only about what type of materials are used in making a house. In other words, explanation provided by the non-tribal children was more structured and systematic than tribal children.

Table-4.10

Summary of Chi-Test on All Four Factors of Sentence Composition Task of Unschooled-Tribal and Non-tribal.

Factor	Non-Tribal Unschooled Children	Tribal Unschooled children	Chi-test Value
Household Things	60%	75%	5.12*
Animals	50%	33%	5.96*
Family Members	8%	8%	0.00
House design	98%	58%	46.60**

*p< .05, **p< .01.

Result Analyses

The performances of unschooled tribal and non-tribal children on sentence composition task are as follows-

As the chi-test value (5.12) showed that there was a significant (p< .05 level) difference between non-tribal and tribal unschooled children on household things. As the table-4.10 shows that about sixty percent of non-tribal unschooled children mentioned the household things whereas about seventy five percent of tribal unschooled children described household things in their description of

'home'. The observation shows that tribal unschooled children described about the things like- utensils, kitchen materials etc. Whereas non-tribal unschooled children described the things like- bed, box, T.V. etc. This could be because tribal sample consisted more of girls than non-tribal sample. The girls in home do work in kitchen. That is why they gave more emphasis on utensils and kitchen material.

The chi-test value (5.96) was found significant at .05 levels on the second factor 'animals'. About fifty percent of unschooled non-tribal children mentioned about animals in their description of 'home', whereas about thirty three percent of tribal unschooled children mentioned animals in the description of 'home'. Although chi-test value (5.96) shows the significant difference yet the observation revealed that tribal and non-tribal unschooled children respond more or less same about animals. Both groups do work with animals. Most of the children are shepherd. They go to the forest for cattle gazing. They also work in fields with the animals.

Chi-test value (0.00) revealed that unschooled tribal and non-tribal children respond about their family members similarly. As the table-4.10 shows that unschooled tribal and non-tribal children responded on this factor equally. In other words, similar number of unschooled tribal and non-tribal children mentioned about their family members in the description of 'home'. This could be because unschooled children do not have the kind of exposure the schooled children have. In schools, children read in their textbooks about the role of their family members in their life and learn to talk about it, whereas unschooled children take this as something given. Although they have same amount of interaction with their parents as schooled children have yet they lack the aptitude for producing responses in a standard format.

The chi-test value (46.60) revealed that non-tribal children responded more about house design than tribal children did. As the table-4.10 shows that about

ninety eight percent of unschooled non-tribal children included house design in their description of 'home', whereas about fifty eight percent of unschooled tribal children mentioned the house design in their description of 'home'. Most of the unschooled non-tribal children work as daily-wage workers. They described their house design in this manner- their houses are made of wood. They used mud and bricks in making their houses. They described not only what type of material they used in making a house but how they made a house also.

Most of the unschooled tribal children work as shepherds. They go to the forest for cattle gazing. They described only what type of material they used in their houses. In other words, unschooled non-tribal children described about their 'house design' in a more descriptive manner than the unschooled tribal children.

Discussion

The present study of the planning tasks (visual search and planned composition) revealed that the relationship between planning and school learning has been found to be weaker than the relationship between coding (simultaneous and successive processing) and school achievement. This may be because planning is a higher order cognitive function, and is the last process to develop both phylogenetically and ontogenetically (Kirby, 1981). Das (1988) suggests that most school learning relates to coding but not to planning skills. This led us to expect that although there may be significant performance differences between schooled and unschooled children on information coding tasks, performance differences in searching especially when a simple perceptual task is used, should be minimal.

As the result shows, there is no cultural impact on visual search task. The reason may be is that the subjects in this study might be too young to exhibit any difference in planning measures, if subjects of higher age group were studied, possibly they would have exhibited significant difference in planning measures.

It is observed by the researcher on controlled search task, through subjects' eye movements that a large number of subjects searched the target stimuli in a very systematic way (vertically or horizontally). While on automatic search task, subjects searched the target stimuli very quickly but in a very haphazard manner. This observation supports Schneider and Shiffrin (1977) views that when the search process is comparatively in that its execution is affected on the basis of visual impression only and the strategic requirements of the task is reduced or absent, the search becomes faster. Field density also affects the results. Increasing density increases the number of stimuli, which must be checked for their identity with the target. Further, the rate at which items are searched and identified depends on the nature of both the target item and the surrounding stimuli as background stimuli interfere with the search for the target. Different classes or categories of stimuli (pictures, letters, numbers) may vary because of varying levels of information content (number of features) among them and the size of sampling and degree of familiarity. Individual differences in the case of access in identifying the stimuli may also influence search time (Fisk and Schider, 1983).

In planned composition tasks, the description about "Home" shows that both the groups' tribal-non-tribal and schooled-unschooled children responded systematically, and in an organized manner. They responded on this task according to their acquaintance with the different factors like- house design, family members, animals etc. They gave more emphasis on the things, which they are more exposed to. As the content analyses shows, schooled children placed more emphasis on family members in their description of 'home', whereas unschooled children placed more emphasis on animals. The reason may be explained by the fact that in schools children read in their textbooks about the role of their family members in their life, whereas unschooled children take this as something given. The observation shows that most of the unschooled children are shepherd that is why they gave more emphasis on animals. However, it does not mean that unschooled children do not have much interaction with their

family members. In this way, the result shows that tribal-non-tribal and schooled-unschooled children performed on the planned composition task similarly. However, they described different aspects of their life depending on their familiarity with these aspects, and also the centrality of these aspects in their life.

Section-III

General Discussion

Hypothesis-I: There will be a significant difference in tribal and non-tribal children cognitive planning.

The results partly confirmed the hypothesis. The result revealed that tribal and non-tribal children differ significantly only on successive processing tasks (Word Recall and Digit Span). On simultaneous and planning tasks, they performed equally.

As the table-4.6 revealed that the tribal and non-tribal children did not differ significantly on simultaneous processing task. Hence, the earlier findings that tribals are inferior to non-tribals in cognitive competence cannot be established. Rather the present study raises an issue that the difference between them in earlier studies could probably be due to several methodological and conceptual problems. In the present study, many such problems have been controlled like the tribal and non-tribal samples in this study did not differ significantly with respect to their socio-demographic variables. Both the groups were drawn from a homogeneous socio-economic environment and the children were reading in the same school and sharing the same educational experience.

In the present study, the successive processing tasks such as Digit Span and Word Recall involve the integration of stimuli into particular serial order where

the elements form a chain-like progression. The critical aspect of successive processing is that element must be ordered without surveyability and elements should be linearly related. Verbal encoding and rehearsal are very much needed which help in storing information in memory for successive processing. At the time of retrieval of the task, the items have to be serially reproduced by the sub-sects. In the present study (Table-4.2 and 4.4) result showed that the tribal performed less well compared to their non-tribal counterparts may be due to their poor encoding and rehearsal ability. The reason, in this context could be that parent's involvement in children's studies as well as elaborative style of conversation in day-to-day life in case of non-tribal provide them enriched oral environment, whereas the tribal children do not have such types of stimulating environment. As a result, the tribal children could not do well in successive processing tasks (Word Recall and Digit Span). In the present study, the observation showed that in non-tribal families, children are encouraged to read at home. Study related materials like newspaper, magazines etc are available in the home. They are also encouraged to do extra curricular activities like drawing figures, cutting and pasting pictures. In most of the families, parents interact with their children during these learning activities, whereas in tribal families, tribal children do not have this kind of exposure. In support of this Mishra, Sinha and Berry (1996) have also stated that the socialization influences (e.g. maternal commands, maternal teaching strategies, parental interactional pattern etc.) may determine a child's cognitive behaviors like linguistic structures, classification skills and concept acquisition strategies, which have been demonstrated by several other studies.

The other reason might be that Word Recall and Digit Span tasks were verbal tests. It has been found that tribal children performed poorly in verbal test. Though tribal community has a rich oral tradition their language is different from that used in the school. Therefore, the language they learn in school is less familiar to them than to the non-tribal child and interactions outside the school

(in the home, community) do not facilitate their acquiring great proficiency in spoken language (Patwardhan, 2000: 13).

In case of planning measures, the tribal children were found to be as good as non-tribal children. Planning process is different from simultaneous, successive and other attentional processes because it provides the individual the means to analyze the cognitive activity, evaluate the effectiveness of a solution and modify the approach used as needed. Planning is required for effective and systematic solution of a problem. Generation, selection and execution of plans are the three main aspects of planning process. In all these higher order-planning activities, the tribal and non-tribal children could not be differentiated (Das, Naglieri and Kirby, 1994).

In Vygotsky's (1986) view, planning is uniquely human and falls within the category of higher cognitive functions". Higher cognitive functions are at least to some degree derivatives of the interpsychological processes that a child participates in during his or her development. Planning therefore has social origins, that is, we learn most of our plans from other, more capable, planners. Moreover, the decision to plan in certain situations and not in others may already be socially determined and individual differences in engaging in planning may reflect social norms and accumulated knowledge about the appropriateness of planning within that context (Goodnow, 1907). In support of this Pani (1993) stated that the performance of tribal subjects were inferior to that of non-tribal subjects not because of inherent inferiority in cognitive ability, but due to lack of proper stimulation at home, developmental delay and production deficiency. Hence, the earlier notion that the tribal children are inferior to non-tribal children in various cognitive problem-solving tasks and intelligence has proved unfounded. The poor performance of the tribal children reported in earlier literature might be due to the consequence of methodological artifacts, experimental bias and ecologically inappropriate and invalid tests and tasks.

Hypothesis-II: Schooled and unschooled children will differ significantly in cognitive planning.

This hypothesis was partly confirmed by the present study. The results revealed that schooled children performed much better than unschooled children of both the groups (tribal and non-tribal) on successive (word Recall and Digit Span) and simultaneous (Memory for Design and Raven's Coloured Progressive Matrices) processing tasks. The observation shows that on planning tasks (visual search and sentence composition tasks) schooled and unschooled children performed equally.

As the result (table 4.1 and 4.3) of the present study revealed that schooled children performed much better than unschooled children on coding tasks (successive and simultaneous processing), the reason might be that in school, learning of a concept begins with a verbal formulation of a general rule. Over the course of time, the student connects this general rule with empirical referents. Therefore, it is not surprising to find that schooled children give a more adequate description of the rules of problem solution than do their unschcoled counterparts (Scribner and Cole, 1978). Another consequence of schooling, as noted by Scribner and Cole (1973), is evident in a child's ability to regard an event as an instance of a general class of events and to search for general principles that can be applied to understand specific instances. A similar observation has been made by Vygotsky (1962), who suggested that children in school engage in a process of inductive reasoning while mastering 'scientific' concepts. Ashton (1975) remarks that school children learn to appreciate processes rather than specific products, as they 'speak ideas about ideas'. By being forced to process information along increasingly abstract dimensions, school children develop a conscious awareness of the mechanism by which they solve cognitive problems. The cognitive benefits accruing from formal educational experience are thus largely attributed to the written form of

language used in schools, emphasis on abstraction and generalization, and teaching of universal principles by way of definition.

In the present study, cognitive tests were derived from the information-processing model of Das, Kirby and Jarman (1975, 79) and dealt with the development of simultaneous and successive processing. On the basis of the physiological and clinical research of a Russian psychologist, A.R. Luria, it is found that the human being processes information either simultaneously or successively. In simultaneous processing, the individual codes different pieces of information simultaneously such as in copying a geometrical figure or finding the missing piece of a pattern, successive processing comes about when the individual is asked to repeat a sentence he/she has just heard, to order object's in a sequence, or to tell a story immediately after he/she heard it. These two processes are basic to any human behavior and come into play as the individual begins to understand his environment. It should be noted here that these two are processes and not abilities; unlike abilities, they describe the mechanisms underlying performance. In earlier research (Cummins and Das, 1977), simultaneous and successive processing has been related to reading, writing, and verbal comprehension. These skills are fostered in the first few years of schooling.

The researcher observed that simultaneous and successive processing seemed to increase both as a function of age and educational experience. Through successive years of schooling experience, the differences between the schooled and non-schooled groups became increasingly wider in favor of the former. The quantitative and qualitative analysis suggested that these two coding processes became progressively differentiated as a function of educational experience. Successive processing appeared to develop much faster in children who attended school.

As the results (Table-4.1, 4.3 and 4.5) revealed that schooled children did much better than their unschooled counter parts on Word Recall and Digit Span tasks (successive processing) and Raven's Coloured Progressive Matrices and Memory for Design (simultaneous processing). This could be because in school, children learn the alphabet, and learn to write letters and words. The skills required for writing letters involve analyses of the letter patterns and subsequent reproduction of these patterns. One important aspect of the letter-writing skills is the child's simultaneous grasp of the structural components of the letters, which through extended practice imparted in schools improves gradually. Gradually the child learns to connect letters to form meaningful words, words to form sentences, and then uses sentences to construct small paragraphs to embed a stream of though in a temporal order. Thus, following the initial acquisition of printing and recognizing alphabets, the skill mostly in demand is decoding which requires successive processing (Cummins and Das, 1977). The skill involved in arranging word elements in a sequence to construct sentences is also characteristic of successive processing, which develop as a child is engaged in school in an elaborate and extended practice of word and sentence construction (Das, Cummins, Kirby and Jarman, 1979). At this stage the child also acquires deliberate remembering devices and begins to develop awareness of a formal linguistic structure- an opportunity which is relatively lacking in the non-school child's environment. So successive processing develops much faster in schooled than in non-schooled children. Beyond the initial stage of reading, as the child becomes aware of the semantic as well as the syntactic aspects of sentences, and as comprehension is increasingly demanded of the child, relational analysis or simultaneous processing assures an increasingly important role (Cummins and Das, 1978). Thus schooling as well facilitates the development of simultaneous processing.

The researcher found that the schools sampled in this present research were poor in terms of their teaching-learning conditions. If comparisons are made between non-schooled children, and children from schools with improved

standards of instruction curriculum and educational facilities, a larger effect of education is, of course expected. As far as this research is concerned, schooling of even poor quality, which is the only type of schooling available in remote rural areas in this part of India, seems to accelerate two basis cognitive functioning; simultaneous and successive processing.

The result of the present study supports the view that processes facilitated by school learning (i.e., simultaneous and successive modes of information processing) differentiated between schooled and unschooled children better than planning processes, which are not as much a part of school learning. It is confirmed by the result (Table-4.7 and 4.8) of the planning tasks (Visual search and Planned Composition Task) that the relationship between planning and school learning has been found to be weaker than the coding (simultaneous and successive processing). Das (1968) suggests that most school learning relate to coding but not to planning skills. The result of the present study showed that schooled-unschooled children performed on the planned composition task according to their familiarity with the different aspects of their life. For example-schooled children placed more emphasis on family members in their description of 'home', whereas unschooled children placed more emphasis on animals. The reason may be explained by the fact that in schools children read in their textbooks about the role of their family members in their life, whereas unschooled children take this as something implicit. This led us to expect that although there may be significant performance differences between schooled and unschooled children on information coding tasks, especially when a simple perceptual task is used, should be minimal.

Chapter-5

Conclusion

It is evident from the foregone discussion that the typical question has been asked to what extent the tribal and disadvantaged children could successfully perform the ability tests or tasks. Hence the present study is an attempt to assess the cognitive planning in case of tribal as well as non-tribal children in Indian context. The objectives of the present piece of work were not only to examine the performance and difference of tribal and non-tribal children on planning task but also to see the effects of schooling on planning tasks. Therefore, the question is raised not only about how planning develops in unschooled children as compared to schooled children but also about how the cultural aspects of planning are transmitted. Specifically, does cultural transmission occur through spontaneous and informal education or largely through schooling? What kind of cultural decision making skills are specifically related to schooling? The present study attempts to address these above questions. This study examined the effects of schooling and culture on cognitive planning of tribal children in Dewas District of Madhya Pradesh.

Objective

The following objectives were used in the present study-

1. To study whether tribal and non-tribal children differ in their cognitive planning.
2. To examine the cognitive planning of schooled and unschooled tribal and non-tribal children.

Hypotheses

The following hypothesis were tested in the study-

1. There will be a significant difference in tribal and non-tribal children cognitive planning.
2. Schooled and unschooled children will differ significantly in cognitive planning.

Research design

The present study consists of an exploratory research design. The aim of the present study is to explore not only independent effect but also the interaction effect of culture and schooling on cognitive planning with reference to tribal and non-tribal children. There are two phases in the study-

First Phase: In the first phase, the researcher examined the social life of tribal and non-tribal groups. This phase broadly covered family size, educational status, occupational status, and child-rearing practices of tribal and non-tribal groups.

Second Phase: After this, different cognitive tasks have been used for measuring cognitive planning of one, tribal and non-tribal and two, schooled-unschooled children. The aim is to examine the cognitive planning strategy of children from different cultural groups who are going to school and those who are not going to school.

Variables

The following variables were included in the research-

Categorical Variables

Culture: The present study consists of both the cultural groups-tribal as well as non-tribal children.

Education: The present study consists of primary level i.e. third standard children from both the groups (Tribal and non-tribal) of same age group 8 to 10 years. The age of the unschooled children is also same as that of the schooled children.

Measured Variables

Cognitive processing: There are three processing unit---

Simultaneous Processing: This process involves the integration of stimuli into groups, or the recognition that a number of stimuli share common characteristics. Both of these aspects require that all the stimuli be related to one another.

Successive Processing: This process involves the integration of stimuli into a particular series where the elements form a chainlike progression.

Planning: It involves, the aptitude for asking new questions, solving problems, and self -monitoring as well as the application of information coding processes.

Matching Variables:

Age: Eight to ten-year-old children were purposively sampled for this study. In several studies, it has been found that the major cognitive tools for planning are acquired between the ages of 5 and 12 years.

Socio-economic status: Socio economic status in this study includes parent's education, parent's occupation, income level etc.

Tools

The following tools were used for the study-

Simultaneous Processing:

Raven's Progressive Matrices: This is a culture free test. It is a test of intellectual (non-verbal) reasoning for children aged 5 to 11 years, consisting of 36 matrices or designs, each having a part, which has been removed.

Memory for Design: This test was originally derived from Graham and Kendall (1960), and has been identified as a stable market test of simultaneous processing. It consisted of 15 simple straight-line designs.

Successive Processing.

Digit Span: This is a successive marker test and is abstracted directly from the WISC. Digits of increasing length were read out to subjects who were required to recall the digits in correct serial order.

Word Recall: This is a marker test of successive processing. The test consisted of two lists of words, six from each of two-letter word and four-letter word.

Planning.

Visual Search: This test was originally identified as an appropriate measure of planning by Ashman (1978) and Das (1980). The test consisted of seven tests and one practice card.

Planned composition: In Sentence Making Task, subjects are asked to make as many sentences as they can on the given words like 'Home'.

Sample

The purposive sampling technique was used in the present study. The sample for this study consisted of fifty -nine children. Out of these fifty-nine children, thirty-two (seventeen schooled and fifteen unschooled children) were from tribal group and twenty-seven (seventeen schooled and ten unschooled children) were from non-tribal group.

Procedure

The subjects were tested individually in one session. The schooled children were tested in separate rooms provided by the headmasters of respective schools. The unschooled children were tested in their locality. The testing session began after establishing adequate rapport with the subject. All the tasks were administered in the order they have been described in this section.

Findings

The findings of the present study are as follows-

It is found in the study that tribal and non-tribal children differ significantly only on successive processing task. On simultaneous and planning tasks, tribal and non-tribal children performed equally.

Non-tribal children performed better than their tribal counterparts on successive processing task, which could be due to their enriched home environment. However, the myth that the tribal child has much less stimulation than the non-tribal child is not supported by the study except in few areas- one of them is verbal stimulation. The verbal exchange between the children and significant others are relatively less in tribal families. However, their active contact with the nature compensates in the area of development of cognitive differentiation skill and also in concept formation. But in the areas where verbal articulation is emphasized, they certainly perform poorly than the non-tribal. A semiotic analysis of the verbal exchanges between non-tribal children and their parents revealed that the children in non-tribal families articulate verbal reasoning in the formats like who, what, where, how and which give them an advantages in testing situations specially when the tests are verbal test.

Supporting evidence is obtained from the finding that tribal and non-tribal children did not differ significantly on simultaneous tasks. Data obtained from the profile study of these two groups revealed that even though non-tribal and tribal children were matched on their socio-economic backgrounds, the non-tribal families were found to have more of modern gadgets like T.V., tape recorder, utensils and also modern toys and puzzles, whereas tribal children were found to be in active contact with every aspect of nature and were allowed to explore their world much more at

a very early stage of life. This probably compensated for lack of active stimulation at home. Therefore, they performed equally well in those testing situation, which were non-verbal in nature.

In case of planning measures, the tribal and non-tribal children did not differ significantly. Planning is required for effective and systematic solution of a problem. Generation, selection & execution of plans are the three main aspects of planning process. In all these higher order-planning activities the tribal and non-tribal children could not be differentiated. Besides, structure and processes, planning has a knowledge base, which is based on prior experiences. In case of non-tribal children, they have an enriched home environment. Their decision making and problem solving skills develops through different sources like the exposure of media, routine life and by the imitation of their adults. In case of tribal children, they have much more contact with the nature. Most of them work in field and goes to the forest for cattle grazing. In all these kinds of work they also need to take quick decisions as they meet with very many new situations all the time while performing their activity in the forest. In other words, these kinds of experiences enrich their knowledge base. This explains the equal performance of tribal and non-tribal children in planning tasks.

Results revealed that schooled children performed better than unschooled children on simultaneous and successive processing tasks of cognitive planning, whereas on planning measures, schooled and unschooled children did not differ significantly.

Results revealed that school is an institution, which promotes cognitive development. The school subjects like geometry, mathematics, and language emphasize the perception of logical relationships, which facilitates simultaneous processing (Das, 1984). Therefore, the schooled children have performed better in simultaneous processing than the unschooled children. More emphasis on rote

memory at the earlier grades possibly helps developing successive coding. Successive processing is probably developed through rote-repetition of the curriculum. An exposure to school education definitely helps both tribal and non-tribal children to develop these two skills- successive and simultaneous processing more, whereas on planning measures, schooled and unschooled children performed equally well. Both the groups described the things systematically and in an organized manner. The present study supports the view that school processes facilitates the development of simultaneous and successive modes of information processing. It also supports the view that planning processes are not as much a part of the school learning processes. This could be attributed to the weaker relationship between planning and school learning than the relationship between coding (simultaneous and successive processing) and school achievement. Das (1968) suggests that most school learning relates to coding but not to planning skills. The reason might be that the ability which is predominantly measured in standard intelligence tests is the ability to code information, that is, to sort information, to store it, and retrieve it. These abilities are of course, necessary. But outside the scholastic environment of classroom, what counts more is a person's aptitude for making evaluations, judgments, and decisions. The essence of human intelligence then is broadly called 'planning' (Das, 1973), which includes all of these activities that lie beyond the gathering and storing of information.

In school, learning of a concept begins with a verbal formulation of a general rule. Over the course of time, the student connects this general rule with empirical referents. So it is not surprising to find that school children give an adequate description of the rules of problem solution, whereas in case of unschooled children, their nature of work enhances their cognitive skills. These cognitive skills help them in solving problem and in making decisions. In other words, the knowledge base of both the schooled as well as unschooled children, get enriched

through their exposure from the environment. That is why both the schooled and unschooled children performed equally well on the planning tasks.

Implication of the study

1. The non-tribal children were found to be performing better than tribal children in successive processing, whereas they matched tribal children in simultaneous processing. The reason could be that tribal children have primarily an oral culture, where chronological presentation and representation of facts may not be part of everyday functioning, whereas in non-tribal families ordering elements based on different relevant salient features and reproducing in this order forms the major style of learning. This probably contributed to the difference, obtained in the present study. However, this doesn't make tribal children cognitively inferior through out their life as this skill can be developed in formal arrangements where such learning processes are emphasised. As we know that at the time of entering the school, tribal children have this disadvantage this should not be used as a yardstick for both performance and growth in the initial classes in the schools. However, this skill may be developed consciously but in a disguised manner in the school. This requires reorganization of curriculum and teacher preparation. The lesson development and organization including evaluation techniques should place more emphasis on simultaneous processing, where children are made to involve themselves in the process of integration of different stimuli into groups based on basic features and explore the relationship between the stimuli. Lessons can be developed on creating different geometrical figure and making them find the missing piece of a pattern. However, text which developed successive processing should not be neglected, if not over emphasized. Analysis of text books in recent time reveals that the lessons primarily, the evaluation aspects place more emphasis on successive processing than simultaneous processing in initial years of schooling. This should be counted.

2. In the present study, it has been found that tribal children performed poorly in verbal test. Though tribal community has a rich oral tradition their language is different from that of the one used in the school. Therefore, the language they learn in school is less familiar to them than to the non-tribal child and interaction outside the school (in the home, community) does not facilitate their acquiring great proficiency in spoken language. The question of whether tribal children should be given instruction in their own language is a widely debated one. This is because one of the major accepted functions of education is equalizing educational opportunity for the disadvantaged sections (Patwardhan, 2000: 13). In a country like India, with its vast diversity, 'equal opportunity' has close linkages with "becoming part of the mainstream". The desirability of this has both ethical and political implications that are still unresolved. However, as far as comparisons of tribal students with non-tribal students are concerned, both groups do not have a 'level playing field'.

One way to creatively negotiate the problem may be to use a topic/story of cultural familiarity to the tribal student and tell this story in the non-tribal language/language of the school. For instance, if a tribal wedding/festival were described in the textbook, it is hypothesized that the student would learn the words for "wedding", "festival", etc. more easily. This is because the content of the text is familiar only the medium is not. However association of the words in the new medium with the words in the tribal language would make acquiring vocabulary in the new language easier. In this regard the innovative work of NGO's merits mention. The school system needs to be sensitized and professionally equipped to work towards meaningful changes.

3. This research may be utilized while planning elementary school curriculum. The two coding processes, simultaneous and successive processing, which seem to develop well at the elementary school level should be taken cognizance of by the teachers, and instructional programs be planned taking into account the strength of

individual students or groups of students in one type of processing or another. The contexts of the curriculum may be taught either in a simultaneous or successive fashion depending on the student's preferred mode of processing information.

4. In tribal area schools, non-tribal teacher's attitude towards tribal children and their culture could be a problem. The beliefs like tribal children lack in abilities, they have an inferior culture, their language is impoverished may affect their academic performance as these may work as self-fulfilling professes. An instance of this attitude is, when a teacher rebukes a child for using a word that is commonly used in his/her day-to-day interactions in the community, because it is considered crude or unsophisticated by the teachers. This works in a cyclic manner to diminish these children's self-esteem.

Limitation

There had been few drawbacks of this study and these are presented below-

1. The sample size was small. It was not large enough to generalize the findings to other tribal groups in the state. The tribals vary in their organization, customs, beliefs, perceptions and culture.

2. Gender difference in children's cognitive planning could not be examined as there were not many schooled girls. The previous research studies show difference in cognitive functioning of male and female. The present study thus had this limitation.

3. Due to time constraints, in-depth interview and observation of teachers, parents and children could not be conducted in this study.

4. In the present study, sample was drawn from a homogeneous socio-economic environment in which parent's income, occupation and education level

were more or less same. If the sample was divided into low and high socio economic status, the results could have been different. This is yet another limitation of the present study.

Further Research Suggestions

1. The present study examines the schooled and unschooled children's cognitive planning. But it is also important to analyze whether the nature of work of unschooled children affect their cognitive planning. This could be explored in future research.

2. This study was undertaken only on third grade and eight to ten year old children. It would be of greater relevance to see whether or not planning as a higher order cognitive function differentiates itself from coding with increasing age and grade. This would require a longitudinal study over a time span of at least three years.

3. As this study examine socio-economic status as a monolith. In further research, socio-economic status could be explored at in-depth level by dividing it into various categories.

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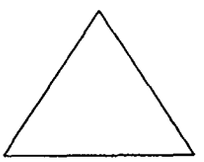
Appendix-1

MEMORY FOR DESIGN



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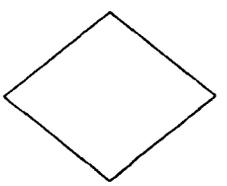

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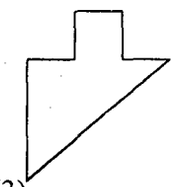

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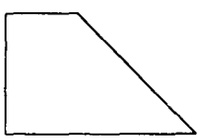

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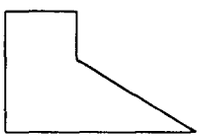

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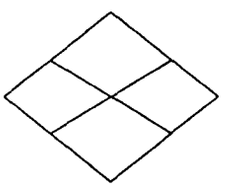

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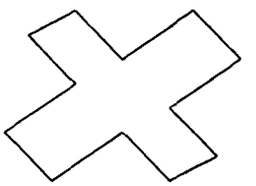

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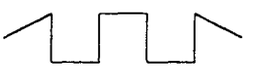

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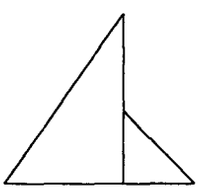

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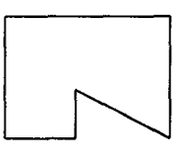

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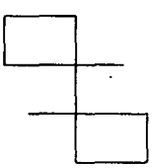

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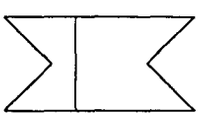

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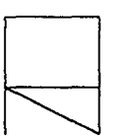

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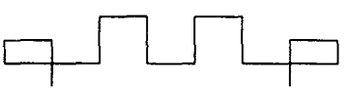


(15)

Appendix-2

Successive Processing Tasks

Word Recall Task:

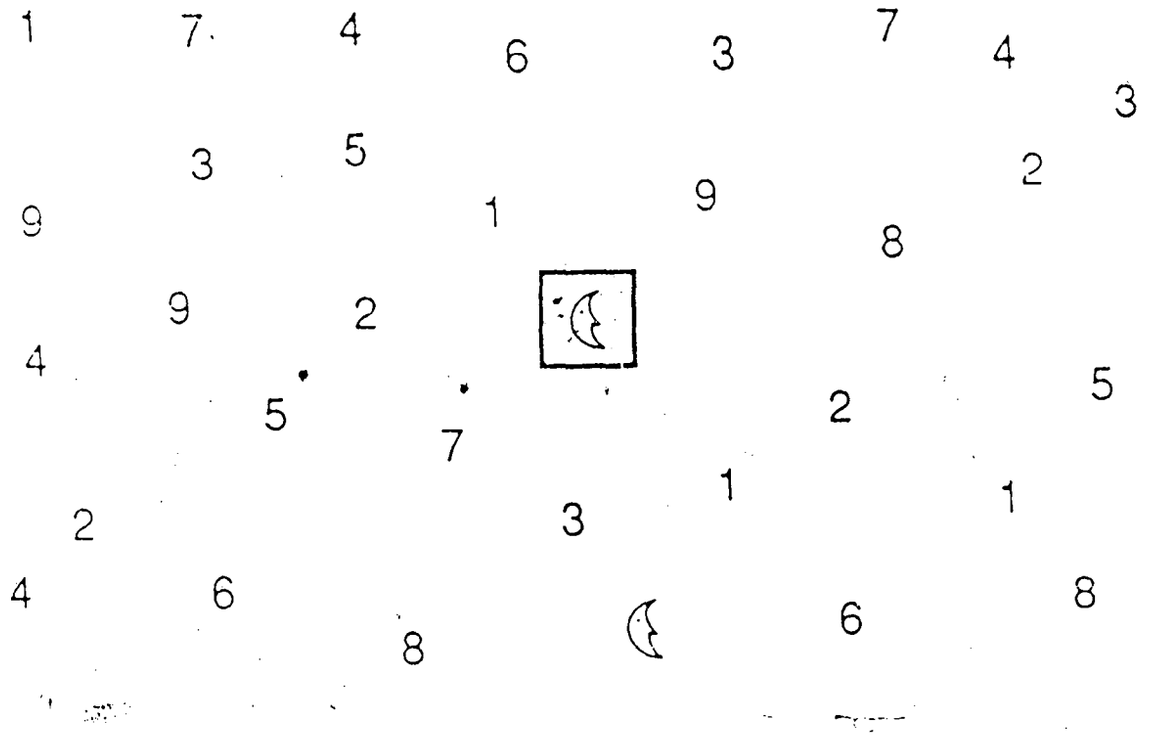
Ist List Items	IInd list Items
बैल	पनहारा
गेंती	बरगद
खेत	सीताफल
हाट	जामफल
लौटा	सोसलिया
सांप	भगौरिया

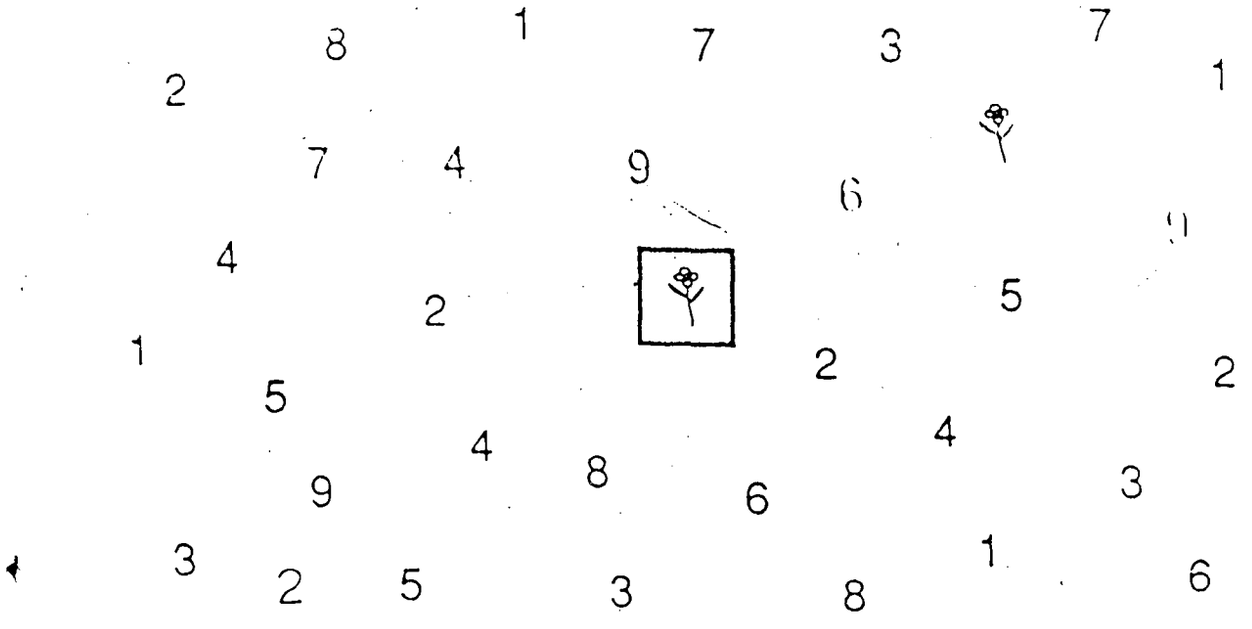
Digit Span Task:

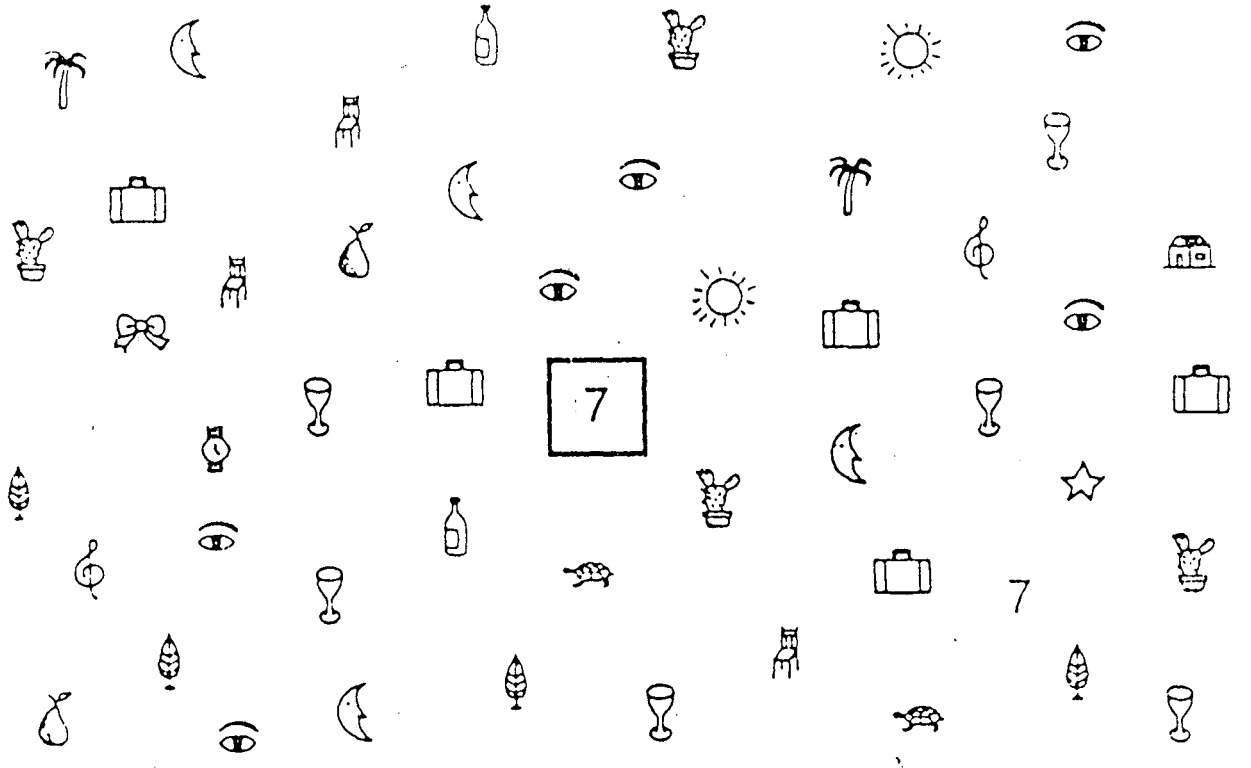
Forward-	6439	42731	619473
	7286	75836	392487
	5917423	58192647	
	4179386	38295174	
Backward-	283	3279	15286
	415	4968	61843
	539418	8129365	
	724856	4739128	

APPENDIX - I

(VISUAL - SEARCH)



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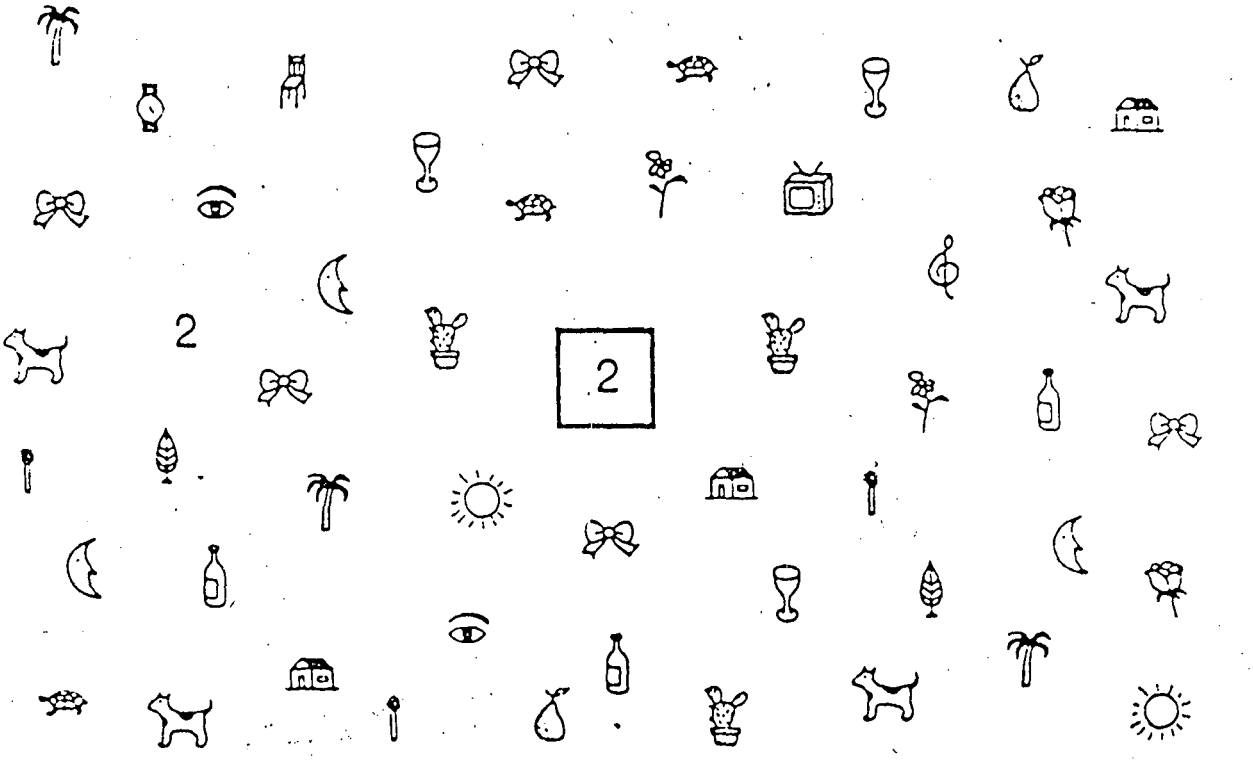
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