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Cognitive Development of All Satges

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Jean Piaget and his co-worker conducted researches on the development of cognition in children for more than the last forty years. His theory of cognitive development explains the qualitative development in the intellectual abilities. Generally cognition can be explained as the process of gaining knowledge about the world through perception, memory and thought. Cognitive development involves the orderly changes that take place in the way children understand the world and solve problems. Jean Piaget developed a very influential theory of cognitive development and divided the development of cognition in four periods which are interdependent to each other.

Stage I	-	The sensory –motor stage i.e. birth to 2 years.
Stage II	-	Pre-operational stage (2-7 years)
Stage III	-	Concrete operational stage (7-11 years)
Stage IV	-	Formal operation (11 to adulthood)

Stage I-The Sensory–Motor Stage:-This period is from birth to 2 years of age. The child since his birth starts interacting with his environment and through the process of constant interaction he gets knowledge of the world. It is sensori – motor stage because the behavior of the child operates on sensori-motor level. This period is very crucial for laying the foundation to understand the world. Babies at this stage organize their physical action called schemes such as sucking, grasping and betting for dealing with the immediate world. Piaget divided this period into further 6 sub stages.

The use of reflexes:- When Piaget talked about the infant's action structures, he used the term scheme or schema. A scheme can be any action for dealing with the environment such as looking, grasping, hitting or kicking. The most prominent reflex is sucking reflex. Babies automatically sucked whenever their lips are touched. This stage lasts for birth to one month.

Primary Circular Reactions (One to 4 months):-A circular reaction occurs when the baby acts upon a new experience and tries to repeat it. For example, a child puts his finger in his mouth accidentally and tries to repeat it again. It is known as primary circular reaction because they involve the co-ordination of parts of the baby's own body.

Secondary Circular Reactions:- (4 to 10 months):- These reactions occur when the baby discovers and reproduces an interesting event outside himself or herself. For example – a child lying in a cradle hits the toy hanging on it with his leg. The child observes it moving and then repeats it and observe it moving again and become happy.

The Co-Ordination of Secondary Reaction (10 to 12 months:- In this stage, the infant's actions become more differentiated. The infant learns to co-ordinate two separate schemes to get a result. For example- A child wants to grab an object and there is an obstacle i.e. an adult puts his hand over it. The infant at this stage can think of striking the hand out of the way and grab the toy. So here the child co-ordinates two separate schemes-striking and grabbing to obtain the goal.

Tertiary Circular Reactions (12 to 18 months):- At this stage, children experiment with different actions to

observe the different outcomes. For example- A year old boy was sitting in the bath tub, watching the water pour down the faucet. He puts his hand under the faucet and notices how the water sprayed outward. He repeats this action twice, making the interesting sight last. But he shifted the position of his hand sometimes nearer; sometimes further away from the faucet, observing how water spray out at different angles. He vary his actions to see what new different results would follow.

Final Stage i.e. The Beginnings of Thought (18 months to 2 years):- At this stage, children seem to think out situations more internally before they act. The most widely known example is lucience and a match box. Piaget placed a chain in the box, which lucience immediately tried to recover. She possessed two schemes: turning the box over and sticking her finger in the box's slit. None of the schemes were successful. She then stopped her actions and observed the slit very carefully. Then, several times opened and closed her mouth wider and wider. After this she promptly opened the box and obtain the chain. Children at this stage are also capable of deferred imitation i.e. the imitation of absent models. By the end of sensori–motor stage, children develop the capacity to recognize that objects continue to exist even when they are not seen or perceived. This ability is known as object permanence. The child becomes capable of representing things mentally. For example=-somebody says the word 'dog', the child gets a mental picture of an object which makes a 'bow bow' sound. The child's mental development can be influenced by providing adequate stimulation i.e. Visual, sound, play materials, books etc.

Stage-II Pre-Operational Stage- (2-7 years)- During this period, the child uses language and images with certain facility. The child engages what is called as "symbolic play" i.e. a wooden block may be considered as a car, a round ring as steering wheel, a round bead as a chocolate etc. During this stage, the child's thinking is basically unsystematic and illogical. True thought and operations do not yet exist. Children do not have the ability to engage in a discussion but they take part in collective monologues. Preoperational children believe that everyone else thinks as they do. The child's thoughts are still limited to the perceptual and motor characteristics of the objects or the situations. Perceptual characteristics are those which are quite visible. For example- Size, texture, colour etc. The motor activities are whether the object is manipulated, turnable, throwable etc., he cannot think beyond what he sees. This period is marked by some attainments. For instance, language is acquired very rapidly. Behavior in the early part is egocentric but by the age of 6 or 7 years children become communicative and social. Now he can solve some small problems of his own initiative.
Limitations of The Pre-Operational Child: Since the thinking of the child is highly influenced by the perceptual characteristics, i.e. what he sees in terms of colour, size, length, shape etc,. the child is unable to understand that since nothing has been added or subtracted from the objects, there should be no difference in the original quantity or number.

The Other Limitations of the Pre-Operational Child Are:-

1. Pre-operational thinking ends to be egocentric that is the child at this age cannot understand the other's point of view. In the sense the child in this age group tends to think that what he thinks and understands is the understanding all have and that there can be no other view to this.
2. Pre-operational thinking tends to focus on only one aspect or dimension of a problem at a time. For example –while looking at the height of an object, the child is unable to consider any changes undergone in its width. The child is unable to handle multiple characteristics.
3. Pre-operational thinking tends to involve transductive reasoning. The pre-operational child reasons from one specific to another specific event, as opposed to inductive and deductive reasoning, i.e. in other words, the child cannot think from particular to general or general to particular. Like for instance, the child knows that all birds therefore but will be unable to conclude that all birds have feathers.

4. The pre-operational child cannot understand relational terms such as larger than, darker than etc. For exm- coming back to those, two boys in this age group, know who is 'good' and who is 'bad' or who is the hero and who is the villain. The young child cannot appreciate that people cannot always be categorized like that and there could be characters in the story or the film which may have shades of good and bad in them.
5. Class inclusion which means that he cannot reason between part and whole simultaneously.
6. The child at this stage is not able to understand how things operate internally or how things relate to one another.

These limitations make the pre-operational child's thinking illogical and inconsistent.

Stage-III The concrete operational stage (7-11 years): Here the first mental operation exists. The ability to conserve volume develops in children i.e. the amount of substance may remain the same even though the shape of the material or size of the container has changed. A child during this stage acts directly or concretely on objects. Children become less egocentred. They experience differences between themselves and other's behavior. Children become more social and cooperative. They follow rules and orders faithfully. They form more complex mental actions on concrete elements of their world. They develop the ability to classify; i.e. the ability to sort out objects on the basis of common features like colour, size or shape. A child begins to classify objects into three or more categories only by the age of eight or nine.

The older child can understand the gradation but the younger child cannot. This is so because the older child has the ability to see the relational merit or demerits of a set of object. Like they have the basic understanding that A is larger than 'B', 'B' is larger than 'C' then 'A' is the largest. They are able to perceive the shades of differences and place the objects in an orderly series.

This process by which the child observes the relational difference in set of objects and organizes them in a series on the basis of these differences is called seriation.Now children can reason about things with which they may have had direct personal experience. But they are limited to thinking about what is 'reality' and cannot deal with what might be 'potentiality'. The child therefore may not be able to think the aspects like-democracy, religion, morality etc.

The concrete-operational child lacks the ability of Hypothetico-Deductive thinking. That is the child is unable to logically think of different possible aspects of a problem and thinking out the irrelevant and selecting that is most appropriate.

Stage-IV The formal operational stage (11 years to adult):- During formal operations, thought processes can be made at hypothetical and abstract level. The capacity for abstract reasoning can be seen. For example- If Shyam is shorter than Sunil and Shyam is taller than Ravi, who is the tallest? At the level of formal operative however adolescents can order their thoughts in their minds alone. Now, thinking reaches its highest degree of equilibrium. When adolescents think about the various possibilities inherent in a situation before hand and then systematically test them, they are working like true scientists.

According to Flavell (1977), adolescents engage in meta-thinking i.e. they develop the capability of thinking about the thinking process rather than merely thinking about the content of their thoughts. They engage in both hypothetic deductive and empirico-inductive reasoning. The concrete operation is limited only to empirico-inductive reasoning.

Formal thought is flexible and effective. Adolescents are able to deal with complex and highly abstract problems of reasoning. At concrete operational stage, child works with the actual, the formal operational adolescent sees possibility as well as actuality. The adolescents when confronted with a problem consider all the alternatives.