

Dr. Nandini Sawaddah

Jean Piaget and cognitive development (1896-1980):

Piaget, through his findings about children, he had a tremendous impact on Twentieth Century Education. Mostly influenced by Kantian philosophy and by American psychologist James Mark Baldwin Piaget had a Neo-Gestaltist approach to child development, and this he chose to call 'genetic epistemology'. Piaget defined 'genetic epistemology' as treating 'the formation and meaning of knowledge' and dealing 'with the means by which the human mind goes from a lower level of knowledge to one that which is judged to be higher'. (Piaget, 1973).

Some Piagetian terms

1. Figurative and operative aspects of knowledge

Figurative aspect of knowledge deals with the perceptual level—'the static, momentary, passive, imitative stages of perception and mental imagery.

The operative aspect of knowledge deals with reconstruction and transformation of perception.

✓ 2. Adaptation: this is a process of interaction of the organism with the environment so that the organism can learn to deal effectively with the environment. Adaptation may take place in two ways—

a) Assimilation b) accommodation.

Assimilation: this is interaction of the organism with the environment in terms of the activities it has already learned.

Accommodation: this is the change in behavior of the organism in the face of environmental demands. When assimilation not possible accommodation occurs.

Scheme: this is the intellectual structure of a young child. E.g. sucking, looking, reading etc.

Schema: this refers to the figurative aspect of thought, whereas scheme refers to the operational aspect. A schema is simplified image. E.g. map of a town. Schemas are subject to change according to the individual's level of growth.

Operation: this is an internalized activity that is subject to certain rules of logic. The most important of which is reversibility.

Conservation: this is realization that quantity of amount or amount remains invariant when nothing has been added to or taken away from a collection of objects despite changes in form of spatial arrangement.

Intelligence: this is the property of activity that is reflected in maximally adaptive behavior. Intelligence in action is viewed as the interaction of an individual with this environment through the 'functioning processes. This interaction results in cognitive structures, which in turn account for the content of behavior.

Imitation: this sort of activity, according to Piaget, is mainly accommodation. By imitating an activity, the child internalizes his environment. Accepting actions mentally, the cognitive structure becomes elaborated and linked with language.

Play: this sort of activity is mainly assimilation. Children assimilate objects to predetermined activities by ignoring those attributes that fit less well.

Stages of development:

Piaget divided the period of a child's development into 4 main stages shown below.

Sensorimotor stage	(0----2) years.
Preoperational stage	(2----7) years.
Concrete operations stage	(7---11) years.
Formal operations stage	(11---adulthood)

Characteristics behavior of children at different stages of development-----

Sensorimotor stage (0—2) years

- I) Absence of language and internal representation.
- II) Notion of permanence and identity of objects is not yet developed.
- III) Perfects and elaborates the small repertoire of schemata acquired at birth.
- IV) Egocentric difficulty is adapting the physical point of view of others.

Achievement by two years.

- i) Begins to acquire language, which in turn accelerates thinking.
- ii) Discovers ~~permanence~~ permanence and identity.
- iii) Learns to coordinate separate activities, like looking and reaching at the same time.
- iv) Acquires the idea of cause and effect, and thus intentionality.

Preoperational stage (2—7) years.

Sub stage-I—pre-conceptual thinking (2-4) years

- I) Can represent objects mentally and identify them according to their classes, but does not understand all the properties of classes. Still can not distinguish between apparently identical members of the same class.
- II) Thinking is not on logical lines, but transductive.

Sub stage-II—intuitive thought (4-7) years

- i) Ceases to reason transductively. Arrives at a more complete understanding of concepts. More logical thinking, but accent on perception.
- ii) Egocentricity. i.e., difficulty in accepting the mentally point of view of others.
- iii) Still can not classify properly. Can deal with single class but not with sub classes.
- iv) Absence of reversible operations and concepts of conservation.

Concrete operations stage-(7-11) years

- i) Can now reason about nested classes.
- ii) Can order things in series: can set up correspondence between two or more series.
- iii) As a result of being able to seriate and classify, the child is now able to understand the cardinal properties of numbers.
- iv) Many of conservation ideas are achieved.

Formal operations stage-(11/12—14/15) years

At this stage, the propositional thinking starts. The child can not only consider concrete things, but starts to reason hypothetically.

For example---

If $A > B$ and $A > C$, which is the greatest, A, B or C?

In general, logical and scientific reasoning (hypothetico deductive reasoning) develops at this stage.

Educational implications of Piaget's theory; -----

Piaget's theory has influenced educational practice all over the world for the last few decades. His work on the sequential growth of the child in general, and on the conceptualization of space, number, causality etc, has shaped the curriculum and methodology in many progressive schools.

The followers of Piaget's theory have often pointed out that traditionally children are taught different concepts like mass, weight, volume, speed, space, etc without concern for the child's natural pattern of comprehending such concepts. The studies of Piaget and his followers do not only provide guidelines in this respect, but also indicate how best to make the child master the different modes of thought in accordance with the different stages of childhood.

As far as methodology is concerned, the outcome of Piaget's work indicates that to teach successfully, the learning situation must provide the child with activities to stimulate further growth. However, which activities to use, and when and how to use them will depend on the individual child.

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