

# Jean Piaget

By Saul  
McLeod

Jean Piaget (1896 - 1980) was employed at the Binet Institute in the 1920s, where his job was to develop French versions of questions on English intelligence tests.

He became intrigued with the reasons children gave for their wrong answers on the questions that required logical thinking. He believed that these incorrect answers revealed important differences between the thinking of adults and children.

Piaget (1936) was the first psychologist to make a systematic study of cognitive development. His contributions include a theory of cognitive child development, detailed observational studies of cognition in children, and a series of simple but ingenious tests to reveal different cognitive abilities.

Before Piaget's work, the common assumption in psychology was that children are merely less competent thinkers than adults. Piaget showed that young children think in strikingly different ways compared to adults.

According to Piaget, children are born with a very basic mental structure (genetically inherited and evolved) on which all subsequent learning and knowledge is based.

## **Piaget's Theory Differs From Others In Several Ways :**

- o It is concerned with children, rather than all learners.
- o It focuses on development, rather than learning per se, so it does not address learning of information or specific behaviors.
- o It proposes discrete stages of development, marked by qualitative differences, rather than a gradual increase in number and complexity of behaviors, concepts, ideas, etc.

The goal of the theory is to explain the mechanisms and processes by which the infant, and then the child, develops into an individual who can reason and think using hypotheses.

To Piaget, cognitive development was a progressive reorganization of mental processes as a result of biological maturation and environmental experience. Children construct an understanding of the world around them, then experience discrepancies between what they already know and what they discover in their environment.

## **There Are Three Basic Components To Piaget's Cognitive Theory :**

- sensorimotor,
- preoperational,
- concrete operational,
- formal operational.

## **Schemas**

Piaget (1952) defined a schema as '*a cohesive, repeatable action sequence possessing component actions that are tightly interconnected and governed by a core meaning*'.

In more simple terms Piaget called the schema the basic building block of intelligent behavior – a way of organizing knowledge. Indeed, it is useful to think of schemas as “units” of knowledge, each relating to one aspect of the world, including objects, actions and abstract (i.e. theoretical) concepts.

Wadsworth (2004) suggests that schemata (the plural of schema) be thought of as 'index cards' filed in the brain, each one telling an individual how to react to incoming stimuli or information.

When Piaget talked about the development of a person's mental processes, he was referring to increases in the number and complexity of the schemata that a person had learned.

When a child's existing schemas are capable of explaining what it can perceive around it, it is said to be in a state of equilibrium, i.e. a state of cognitive (i.e. mental) balance.

Piaget emphasized the importance of schemas in cognitive development, and described how they were developed or acquired. A schema can be defined as a set of linked mental representations of the world, which we use both to understand and to respond to situations. The assumption is that we store these mental representations and apply them when needed.

For example, a person might have a schema about buying a meal in a restaurant. The schema is a stored form of the pattern of behavior which includes looking at a menu, ordering food, eating it and paying the bill. This is an example of a type of schema called a 'script'. Whenever they are in a restaurant, they retrieve this schema from memory and apply it to the situation.

The schemas Piaget described tend to be simpler than this - especially those used by infants. He described how - as a child gets older - his or her schemas become more numerous and elaborate.

**The illustration (above)** demonstrates a child developing a schema for a dog by assimilating information about the dog. The child then sees a cat, using accommodation compares existing knowledge of a dog to form a schema of a cat. *Animation created by Daurice Grossniklaus and Bob Rodes (03/2002).*

Piaget believed that newborn babies have a small number of innate schemas - even before they have had much opportunity to experience the world. These neonatal schemas are the cognitive structures underlying innate reflexes. These reflexes are genetically programmed into us.

For example babies have a sucking reflex, which is triggered by something touching the baby's lips. A baby will suck a nipple, a comforter (dummy), or a person's finger. Piaget therefore assumed that the baby has a 'sucking schema'.

Similarly the grasping reflex which is elicited when something touches the palm of a baby's hand, or the rooting reflex, in which a baby will turn its head towards something which touches its cheek, were assumed to result operations: for example shaking a rattle would be the combination of two schemas, grasping and shaking.

## **Assimilation and Accommodation**

Jean Piaget (1952; see also Wadsworth, 2004) viewed intellectual growth as a process of **adaptation** (adjustment) to the world. This happens through:

- **Assimilation**

- Which is using an existing schema to deal with a new object or situation.

- **Accommodation**

- This happens when the existing schema (knowledge) does not work, and needs to be changed to deal with a new object or situation.

## • Equilibration

– This is the force which moves development along. Piaget believed that cognitive development did not progress at a steady rate, but rather in leaps and bounds.

Equilibrium occurs when a child's schemas can deal with most new information through assimilation. However, an unpleasant state of disequilibrium occurs when new information cannot be fitted into existing schemas (assimilation).

Equilibration is the force which drives the learning process as we do not like to be frustrated and will seek to restore balance by mastering the new challenge (accommodation).

Once the new information is acquired the process of assimilation with the new schema will continue until the next time we need to make an adjustment to it.

### Example of Assimilation

A 2 year old child sees a man who is bald on top of his head and has long frizzy hair on the sides. To his father's horror, the toddler shouts "Clown, clown" (Siegler et al., 2003).

### Example of Accommodation

In the "clown" incident, the boy's father explained to his son that the man was not a clown and that even though his hair was like a clown's, he wasn't wearing a funny costume and wasn't doing silly things to make people laugh.

With this new knowledge, the boy was able to change his schema of "clown" and make this idea fit better to a standard concept of "clown".

### Stages of Development

A child's cognitive development is about a child developing or constructing a mental model of the world.

Imagine what it would be like if you did not have a mental model of your world. It would mean that you would not be able to make so much use of information from your past experience, or to plan future actions.

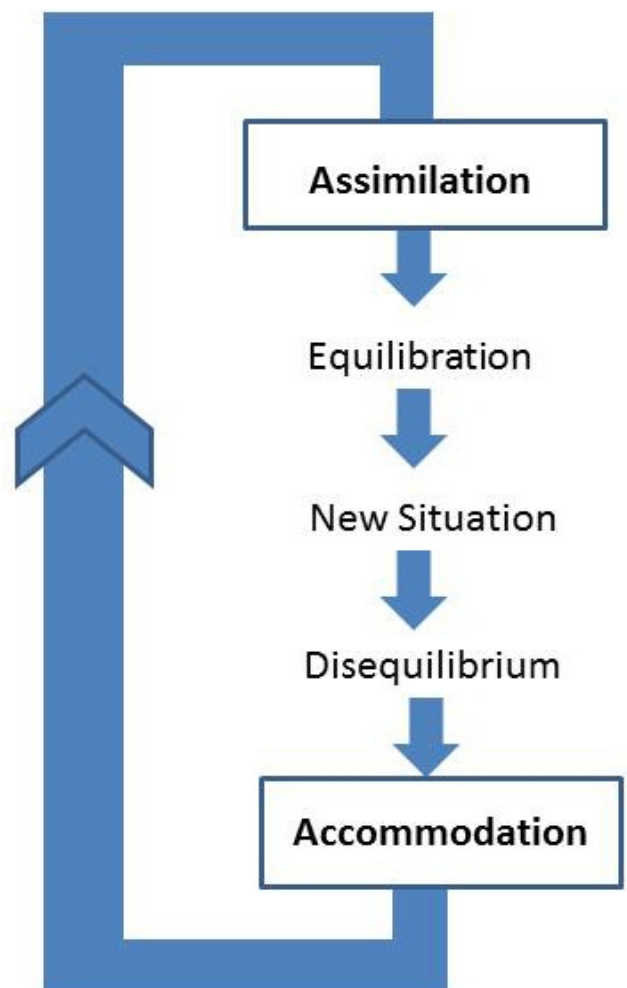
Jean Piaget was interested both in how children learn and in how they thought.

Piaget studied children from infancy to adolescence, and carried out many of his own investigations using his three children. He used the following research methods:

Piaget made careful, detailed naturalistic observations of children. These were mainly his own children and the children of friends. From these he wrote diary descriptions charting their development.

He also used clinical interviews and observations of older children who were able to understand questions and hold conversations.

Piaget believed that children think differently than adults and stated they go through 4 universal stages of



cognitive development. Development is therefore biologically based and changes as the child matures. Cognition therefore develops in all children in the same sequence of stages.

Each child goes through the stages in the same order, and no stage can be missed out - although some individuals may never attain the later stages. There are individual differences in the rate at which children progress through stages.

Piaget did not claim that a particular stage was reached at a certain age - although descriptions of the stages often include an indication of the age at which the average child would reach each stage.

Piaget (1952) believed that these stages are universal - i.e. that the same sequence of development occurs in children all over the world, whatever their culture.

| Stage of Development                | Key Feature                                       | Research Study         |
|-------------------------------------|---|------------------------|
| Sensorimotor<br>0 - 2 yrs.          | Object Permanence                                 | Blanket & Ball Study   |
| Preoperational<br>2 - 7 yrs.        | Egocentrism                                       | Three Mountains        |
| Concrete Operational<br>7 - 11 yrs. | Conservation                                      | Conservation of Number |
| Formal Operational<br>11yrs +       | Manipulate ideas in head, e.g. Abstract Reasoning | Pendulum Task          |

## Educational Implications

Piaget (1952) did not explicitly relate his theory to education, although later researchers have explained how features of Piaget's theory can be applied to teaching and learning.

Piaget has been extremely influential in developing educational policy and teaching practise. For example, a review of primary education by the UK government in 1966 was based strongly on Piaget's theory. The result of this review led to the publication of the [Plowden report](#) (1967).

Discovery learning – the idea that children learn best through doing and actively exploring - was seen as central to the transformation of primary school curriculum.

'The report's recurring themes are individual learning, flexibility in the curriculum, the centrality of play in children's learning, the use of the environment, learning by discovery and the importance of the evaluation of children's progress - teachers should 'not assume that only what is measurable is valuable.'

Because Piaget's theory is based upon biological maturation and stages the notion of 'readiness' is important. Readiness concerns when certain information or concepts should be taught. According to Piaget's theory children should not be taught certain concepts until they have reached the appropriate stage of cognitive development.

According to Piaget (1958), assimilation and accommodation require an active learner, not a passive one, because problem-solving skills cannot be taught, they must be discovered.

Within the classroom learning should be student centred and accomplished through active discovery learning. The role of the teacher is to facilitate learning, rather than direct tuition. Therefore teachers should encourage the following within the classroom:

- o Focus on the process of learning, rather than the end product of it.

- o Using active methods that require rediscovering or reconstructing "truths".

- o Using collaborative, as well as individual activities (so children can learn from each other).
- o Devising situations that present useful problems, and create disequilibrium in the child.
- o Evaluate the level of the child's development, so suitable tasks can be set.

## Evaluation of Piaget's Theory

### Support

- The influence of Piaget's ideas in developmental psychology has been enormous. He changed how people viewed the child's world and their methods of studying children. He was an inspiration to many who came after and took up his ideas. Piaget's ideas have generated a huge amount of research which has increased our understanding of cognitive development.
- His ideas have been of practical use in understanding and communicating with children, particularly in the field of education (re: Discovery Learning).

### Criticisms

- Are the stages real? [Vygotsky](#) and [Bruner](#) would rather not talk about stages at all, preferring to see development as continuous. Others have queried the age ranges of the stages. Some studies have shown that progress to the [formal operational stage](#) is not guaranteed. For example, Keating (1979) reported that 40-60% of college students fail at formal operation tasks, and Dasen (1994) states that only one-third of adults ever reach the formal operational stage.
- Because Piaget concentrated on the universal stages of cognitive development and biological maturation, he failed to consider the effect that the social setting and culture may have on cognitive development (re: [Vygotsky](#), 1978).
- Piaget's methods (observation and clinical interviews) are more open to biased interpretation than other methods. Because Piaget conducted the observations alone the data collected are based on his own subjective interpretation of events. It would have been more reliable if Piaget conducted the observations with another researcher and compared the results afterwards to check if they are similar (i.e. have inter rater reliability).
- As several studies have shown Piaget underestimated the abilities of children because his tests were sometimes confusing or difficult to understand (e.g. [Hughes](#), 1975).
- The concept of schema is incompatible with the theories of Bruner (1966) and Vygotsky (1978). [Behaviorism](#) would also refute Piaget's schema theory because it cannot be directly observed as it is an internal process. Therefore, they would claim it cannot be objectively measured.
- Piaget carried out his studies with a handful of participants (i.e. small sample size) – and in the early studies he generally used his own children (from Switzerland). This sample is biased, and accordingly the results of these studies cannot be generalized to children from different cultures.

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