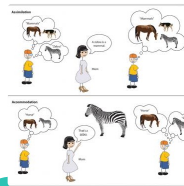




Piagetian Theory

Central to his theory are the following two concepts:

- **Adaptation**
Involving the creation of schemas through interaction with the environment allowing adjustments to environmental demands
- **Organisation**
Refers to the child's tendency to organize their schemas into efficient systems (can be independent of interaction with the environment)



Piagetian Theory

Adaptation takes place through 2 processes:

Assimilation
the process of integrating the environment into current psychological structures (schemas)

Accommodation
occurs when old schemas are adjusted to better fit with the demands of the environment

Piagetian Theory

Piaget believed development occurs due to predisposition to **organise** and **adapt** to new experiences in four stages:

- **Sensorimotor**
The first 2 years of life where the child moves from simple reflexive responses to being able to think about the environment using symbols
- **Preoperational**
2-7 years: prelogical; children's thinking in terms of representational abilities (language, pictorial and spatial representation, pretend play)
- **Concrete operational**
The ability to think using mental operations; the child also develops the mental skills that enable them to understand classification hierarchies
- **Formal operational**
At around 11 years the child is capable of reasoning in propositional, abstract and hypothetical ways

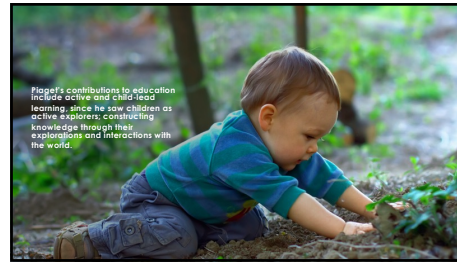
Piaget's Stages of Sensorimotor Development (Keenan, Evans, & Crowley, 2016)		
Substage	Age	Significant Accomplishments and Limitations
Sensorimotor Stage	0-2 years	Infants initially understand the world via action but gradually develop the ability to use symbolic representations.
	0-1 months	Infants gain control over and practice reflex behaviours.
• Reflexive Schemes	1-4 months	Infants repeat chance behaviours that lead to satisfying results (e.g., thumb sucking), and show a limited ability to anticipate events.
• Primary Circular Reactions	4-8 months	Infants use repetitive single schemes into larger structures (e.g., repeatedly grasping and shaking a rattle). This behaviour is not goal-directed however.
• Secondary Circular Reactions	8-12 months	Secondary circular reactions are combined into new <u>adjusts</u> , and become <u>intentional</u> . For example, infants can coordinate a means and a goal.
• Coordination of Secondary Circular Reactions	12-18 months	Infants begin to repeat actions and use them in a deliberately exploratory manner. Can solve the A-not-B task and develop object permanence.
• Tertiary Circular Reactions	18-24 months	Onset of the child's ability to think symbolically and mentally represent reality. Also marks the beginning of pretend play.
• The Invention of New Means Through Mental Combinations		

Piaget's Stages: Preoperational, Concrete Operations & Formal Operations (Keenan, Evans, & Crowley, 2016)		
Stage	Age	Description
Preoperational Stage	2-7 years	- The growth of representational abilities. • Egocentrism: the child of this stage has a tendency to view only his/her own perspective. • An animistic thinking: the child attributes life-like qualities to inanimate objects. • Limited ability to master operations, such as reversibility and conservation: child only focuses on one aspect of a problem.
Concrete Operations	7-11 years	- The ability to think using mental operations. • Conservation: understanding that the physical characteristics of an object or substance or quantity remain the same even when its shape, size, length, mass, etc. change. • Classification: hierarchical: mental grouping of objects into classes. • Seriation: mental ordering of objects into a series on a particular basis (size, weight, height, length, etc.). • Reversibility: child can think about the reverse of an action.
Formal Operations	11+ years	- Attainment of cognitive development: Reasoning in propositional, abstract, and hypothetical ways. • Hypothetico-deductive reasoning: the ability to start with a general theory, or set of premises (assumed to be correct), and deduce or derive conclusions from the premises. This is the highest level of the hierarchy. • Propositional thinking: Reasoning based on the logical properties of a set of propositions rather than deriving concrete conclusions.



Piaget's Experiments

Conservation task
Object permanence
4 stages of cognitive development



Piaget's contributions to education include active and child-led learning, since he saw children as active explorers constructing knowledge through their experiences and interactions with the world.



Vygotskian Theory (Sociocultural view)

Has three main themes:

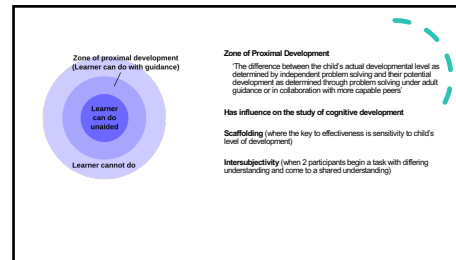
- The study of development is a historical process focusing on the origins of mental processes and their associated transformations
- An individual's cognitive development is largely a social process
- All human cognitive activity is mediated by the use of symbolic 'tools' (language, art, numbers, other culturally derived products)

Vygotskian Theory

Patterning of development refers to 'any function in the child's cultural development appears twice or on two planes'

- **Social plane**
Development results from processes occurring first between people
- **Psychological plane**
Development then occurs within people

This process of moving functions is known as **internalization**



Vygotskian Theory

Language and Play

- Children's 'inner' speech referred to as 'private speech'
- Pretend play** occurs at a level beyond the child's stage in life (take on parent/doctor role) – said to be in a zone of proximal development in advance of their real capabilities
- Pretend play an important context in which the child learns about the social world

Vygotskian Theory

Education

- Peer collaboration** – i.e., reciprocal teaching, where peers foster dialogues of a subject at a level beyond the child's individual capability but within the zone of proximal development
- Cooperative learning** (groups of peers are formed of more and less knowledgeable peers and expert instruction is given to those less knowledgeable by those with greater knowledge)

- Mind is (like) a system manipulating symbols according to a set of rules
- Draw parallels between human cognition and computers (computer a tool to test models of cognitive development: Kahn & MacWhinney, 1998)
- Share three basic assumptions:
 - Thinking is information processing
 - Emphasize the need to study change mechanisms
 - Development driven by self-modification

Information Processing Theories

Seigler (1998) suggests information processing theories focus on **structural characteristics** (the organisation of the information processing system) and the **processes** that allow for the means for cognition to adapt to changing demands of the environment

Information Processing Theories

The diagram illustrates the Information Processing Model. It shows a flow from 'Sensory Input' (represented by a red box) to 'Sensory Register' (blue box), then to 'Working Memory' (red box), and finally to 'Long-Term Memory' (blue box). Arrows indicate the direction of information flow. A feedback loop is shown from 'Long-Term Memory' back to 'Working Memory'. A dashed green line connects the 'Sensory Register' and 'Long-Term Memory' boxes.

Information Processing Theories

Structural Characteristics

Based on a 3 part model (store model)

- Sensory register (memory store)
- Working memory (where thinking occurs)

Increased capacity via 'chunking' (information held here is organized into meaningful units, forming complex mental representations)

- Long-term memory (the part of the cognitive system that contains the permanent knowledge base)

Processes

Encoding – the process by which important features of an object or event are picked out to form a representation that are relevant and important to thinking

Automatization – requires little conscious attention and any automatized skill will result in increases in the speed of the ability to execute that skill. Working capacity is freed up and so allows for monitoring of cognitive performance and learn to make further improvements

Information Processing Theories

Case (1985, 1992)

- Similar to Piaget's theory of cognitive development as it assumes qualitative changes

Differs in the belief that shifts in cognitive development result from increases in information processing capacity (in-space)

Myelination speeds electrical transmission through the brain increasing capacity and utilizes working memory more efficiently

Development of cognitive strategies frees capacity and increases automatization

Automatization leads to development of central conceptual structures allowing for more advanced thinking

- Strength in the ability to account for transitions from one stage of thought to the next

Information Processing Theories

Information Processing Theories

Connectionism

- Relates to the use of artificial neural networks in order to determine what actually occurs in the brain as it develops
- Connectionists believe that the human cognitive system gradually attains knowledge as a result of learning opportunities
- Criticised for simplicity

Summary

Piaget focuses on the nature of a child's interaction with its physical environment

Vygotsky stresses that social interaction between children and more skilled members of their culture are critical to cognitive development

Information processing theorists emphasize the importance of studying the mechanisms which lead to developmental change
