

## Piaget's Theory of Cognitive Development

Slide 1	One of the major differences between animals and human beings is that humans have the potential to engage in abstract thought. Piaget's theory of cognitive development describes how that potential is actualized. Hello and welcome to an overview of Piaget's theory of cognitive development. My name is Bill Huitt and I am Professor Emeritus at Valdosta State University and Adjunct Professor at Capella University. The presentation is narrated by Geoff Huitt who is helping me produce these videos.
Slide 2	Remember that in the early 20 <sup>th</sup> century, psychology was dominated by two theoretical approaches
Slide 3	the psychodynamic theories of Freud, Adler, Jung and
Slide 4	the behavioral theories of Watson, Thorndike, and Skinner.
Slide 5	During that same time period of the early 20 <sup>th</sup> century, Jean Piaget, who lived from 1896 to 1980 developed a theory of human cognitive development that did not become popular until the cognitive revolution of the 1950s and 1960s.
Slide 6	Piaget was a remarkable scholar who produced his first published paper on mollusks at the age of 11. He continued to study biology
Slide 7	as well as philosophy and earned a PhD at the age of 22.
Slide 8	He then went to Paris and taught at a school run by Alfred Binet and worked in his lab where Binet was developing an intelligence test. He became interested in why children of a certain age answered questions incorrectly, but in the same way.
Slide 9	Piaget's work in biology, philosophy, psychology, and sociology lead to the development of his theory of cognitive development which he labeled genetic epistemology as he was interested in how biology impacts how human beings come to know themselves and the world around them.
Slide 10	In 1943, Piaget supervised Bärbel Inhelder's PhD dissertation and they collaborated on the development of the theory until his death in 1980.

Slide 11	Piaget's theory consists of two components.
Slide 12	The first is the process by which human beings construct mental representations as they interact with their environments
Slide 13	and the second is a sequence of stages that Piaget hypothesized were invariant across all human beings regardless of the environments in which they were raised.
Slide 14	As stated previously, Piaget labeled his theory genetic epistemology.
Slide 15	Central to this theory is the concept of schemes or schema as they are sometimes called. The difference between the two terms is that scheme refers to a pattern of action while schema more often refers to a more static concept or image.
Slide 16	For example, as infants and children interact with the environment, they form mental images such as tree or field and when they develop language, they attach labels to those images.
Slide 17	At the same time, they develop action patterns such as how to order food at a restaurant.
Slide 18	These schemes or created mental representations allow them to interact with, and adapt to, the demands of the environment.
Slide 19	This is done using two compatible processes. The first is labeled assimilation. For example, the child might form a schema of a dog as a result of seeing and interacting with one.
Slide 20	Later, the child is able to assimilate, or bring into the schema, a wide variety of examples of dogs although they may differ in multiple characteristics.
Slide 21	The second process is labeled accommodation. In this case, the child might see a cat and attach the label dog to it. However, the parent will provide feedback that this is a different animal, labeled cat.

Slide 22	The child then creates a new category of cat and begins the process of assimilating other examples of cat into this new scheme.
Slide 23	The term Piaget uses for the success of adapting to the environment is equilibration. By this he means that the schemes that have been created allow the individual to achieve equilibrium with the demands of the environment.
Slide 24	For example, learning to dress oneself is a relatively complicated task. One has to learn to put on underwear first, then pants and shirt, and finally socks and shoes. Each of these tasks requires a slightly different skill set that must be mastered and there is a required order for completion. And there are thousands of these mental representations that must be created, some of which must be replaced by better schemes as one grows and develops.
Slide 25	Piaget identified four stages that people go through as they move from infancy to adulthood.
Slide 26	The first is labeled sensorimotor and occurs in infancy.
Slide 27	At this stage the infant is interacting with the environment through sensory and motor activities without the use of language.
Slide 28	One of the significant milestones for this stage is the development of object permanence where the infant understands that objects do not disappear simply because they can no longer be seen.
Slide 29	The next stage, which occurs between about 18 to 24 months and about 5 to 7 years old is labeled pre-operational. At this stage children begin to develop language and use imagination in playful ways.
Slide 30	For example, they can imagine that dogs can play cards and that animals can talk. It is not unusual to have an imaginary friend at this age.
Slide 31	Piaget hypothesized that all children would begin to move into the concrete operational stage beginning about the time that most children start formal schooling.

Slide 32	At this stage children can engage in logical thinking with concrete objects, especially those that they can manipulate. Children slowly attain what Piaget describes as conservations where a feature of the object is changed but there is, in fact, no change.
Slide 33	David Elkin, in a video prepared by Davidson Films, provides an excellent, short overview of this stage available on Youtube at the URL shown on the screen <a href="https://www.youtube.com/watch?v=UNmUjRf0ekQ">https://www.youtube.com/watch?v=UNmUjRf0ekQ</a> . In fact, there are a wide variety of Youtube videos that show different aspects of cognitive development at this stage.
Slide 34	The fourth stage according to Piaget is the Formal Operational stage in which the individual is able to engage in abstract logical thinking.
Slide 35	Whereas in the concrete operational stage, individuals needed to have a concrete reference in order to think logically,
Slide 36	In the formal operations stage, the individual is able to engage in the logical manipulation of ideas when there is no immediate concrete reference.
Slide 37	<p>Piaget’s hypothesis was that human beings would automatically move into and through a stage as they interacted with the environment. While this seems to be true for the sensorimotor and pre-operational stages, notice that the data represented in this figure shows this is not actually the case. While the subjects in this study began to move from the pre-operational stage to the concrete operational stage at ages 5 and 6, notice that about 20% of the sample remain in this stage by age 9 or the beginning of fourth grade. While these children will likely be classified as special ed learners at this age, it is important to recognize they are behind their peers in cognitive development and need the same type of instructional activities as 5- and 6-year-old children needed several years earlier.</p> <p>Notice also that, while the vast majority of 11-year-olds have attained some aspect of concrete operations, there are still a significant number who have not achieved all of the conservations identified by Piaget. Again, this is important for teachers to acknowledge as they develop learning activities for their classrooms.</p> <p>Finally, notice that the development of formal operations does not move as quickly as did the development of concrete operations. In fact, less than 25% of adolescents have started or attained formal operations by age 14, three years after Piaget thought they should make the transition. For concrete operations, the comparable number is 75% at age 9.</p>

Slide 38	<p>In a comparable study completed a decade later, notice that about 24% of the sample had started or achieved the transition to formal operations and gained the ability to engage in abstract logical thinking. Unfortunately, this number has only increased to 34% by the time the learners were graduating from high school. The data show emphatically that the environment of traditional schooling is insufficient to provide the vast majority of learners with the demands that would require movement to abstract thinking even though they may be biologically prepared to do so.</p>
Slide 39	<p>While this might not have been an issue when large portions of the workforce were employed in low- or moderately-skilled manufacturing jobs prevalent in the 19<sup>th</sup> and 20<sup>th</sup> centuries, this is especially critical for today's youth as these jobs are moving to Asia</p>
Slide 40	<p>and to Africa. The percentage of workers employed in agriculture, mining, and manufacturing in most developed countries today is between 20- and 30% and that number is diminishing rapidly.</p>
Slide 41	<p>Instead the high paying jobs and career opportunities require the ability to engage in abstract logical and creative thinking. These are basic prerequisite skills necessary if youth are to take full advantage of the many opportunities that are being created for meaningful work.</p> <p>Some suggestions for how to best use the principles of cognitive development identified by Piaget and how to engage learners at different stages will be the topic of a separate presentation.</p>
Slide 42	<p>It should be acknowledged that a number of researchers have developed theories that postulate a fifth stage applicable to adults labeled post-formal operations. The stage focuses on identifying and solving so-called "wicked" problems that require more than logical analysis to arrive at multiple possible solutions. A discussion of this work is beyond the scope of this brief overview.</p>
Slide 43	<p>One of the post prominent authors in this work is Michael Commons who provides an overview of post-formal operational thought and hypothesizes five sub-stages in its development. He and his colleagues have been investigating this topic since the early 1980s.</p>
Slide 44	<p>Another prominent scholar in Gerald Young who attempted to integrate Piagetian cognitive development and Eriksonian socioemotional development; he identified five sub-stages of post-formal thinking. This work deserves attention by those working in adult education.</p>

Slide 45	<p>Eylon, B., &amp; Linn, M. (1988). Learning and instruction: An examination of four research perspectives in science education. <i>Review of Educational Research</i>, 58(3), 251–301</p> <p>Huitt, W. (2017, June). A phase change: Forces, trends, and themes in the human sociocultural milieu (revised). <i>Educational Psychology Interactive</i>. Valdosta, GA: Valdosta State University. Retrieved from <a href="http://www.edpsycinteractive.org/papers/2017-huitt-a-phase-change.pdf">http://www.edpsycinteractive.org/papers/2017-huitt-a-phase-change.pdf</a></p> <p>Huitt, W., &amp; Hummel, J. (2003). Piaget's theory of cognitive development. <i>Educational Psychology Interactive</i>. Valdosta, GA: Valdosta State University. Retrieved from <a href="http://www.edpsycinteractive.org/topics/cognition/piaget.html">http://www.edpsycinteractive.org/topics/cognition/piaget.html</a></p>
Slide 46	<p>Lutz, S., &amp; Huitt, W. (2018). Connecting cognitive development and constructivism. In W. Huitt (Ed.), <i>Becoming a Brilliant Star: Twelve core ideas supporting holistic education</i> (pp. 45-63). La Vergne, TN: IngramSpark. Retrieved from <a href="http://www.edpsycinteractive.org/papers/2018-03-lutz-huitt-brilliant-star-cognitive-development.pdf">http://www.edpsycinteractive.org/papers/2018-03-lutz-huitt-brilliant-star-cognitive-development.pdf</a></p> <p>McCarthy-Gallagher, J., &amp; Reid, D. K. (2002). <i>The learning theory of Piaget and Inhelder</i>. Lincoln, NE: iUniverse. (Originally published in 1981).</p> <p>Piaget, J. (1972). <i>The psychology of the child</i>. New York, NY: Basic Books.</p> <p>Piaget, J. (1990). <i>The child's conception of the world</i>. New York, NY: Littlefield Adams.</p>
Slide 47	<p>Piaget, J., Gruber, H. (Ed.), &amp; Voneche, J. J. (Ed.). <i>The essential Piaget</i> (100th Anniversary Ed.). New York, NY: Jason Aronson.</p> <p>Renner, J., Stafford, D., Lawson, A., McKinnon, J., Friot, E., &amp; Kellogg, D. (1976). <i>Research, teaching, and learning with the Piaget model</i>. Norman, OK: University of Oklahoma Press.</p>
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