



Jean Piaget's Cognitive Theory

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Concrete Operational Stage (7-11 years of age)

The concrete operational stage is the third stage in [Piaget's theory of cognitive development](#). This period spans the time of middle childhood—it begins around age 7 and continues until approximately age 11—and is characterized by the development of logical thought. Thinking still tends to be very concrete, children become much more logical and sophisticated in their thinking during this stage of development. Kids at this age become more logical about concrete and specific things, but they still struggle with abstract ideas.

Concrete Operational Stage

Abstract thinkers are able to reflect on events and ideas, and on attributes and relationships separate from the objects that have those attributes or share those relationships. Thus, for example, a **concrete thinker** can think about this particular dog; a more **abstract thinker** can think about dogs in general.

Major Characteristics and Developmental Changes

- During this stage, children begin to thinking logically about concrete events
- They begin to understand the concept of conservation; that the amount of liquid in a short, wide cup is equal to that in a tall, skinny glass, for example
- Their thinking becomes more logical and organized, but still very concrete
- Children begin using inductive logic, or reasoning from specific information to a general principle

Concrete Operational Stage

While children are still very concrete and literal in their thinking at this point in development, they become much more adept at using logic.

The egocentrism of the previous stage begins to disappear as kids become better at thinking about how other people might view a situation.

During this stage, children also become less egocentric and begin to think about how other people might think and feel. Kids in the concrete operational stage also begin to understand that their thoughts are unique to them and that not everyone else necessarily shares their thoughts, feelings, and opinions.

Concrete Operational Stage

Piaget determined that children in the concrete operational stage were fairly good at the use of inductive logic (inductive reasoning). Inductive logic involves going from a specific experience to a general principle.

- An example of inductive logic would be noticing that every time you are around a cat, you have itchy eyes, a runny nose, and a swollen throat. You might then reason from that experience that you are allergic to cats.
- On the other hand, children at this age have difficulty using [deductive logic](#), which involves using a general principle to determine the outcome of a specific event. For example, a child might learn that $A=B$, and $B=C$, but might still struggle to understand that $A=C$.

Concrete Operational Stage

Milestones of the Concrete operational stage

- Ability to distinguished between their own thoughts and the thoughts if others.
- Increased classification skills: Children are able to classify objects by their number, mass, and weight.
- Ability to think logically about objects and events.
- Ability to fluently perform mathematical problem in both addition and subtraction.

Important Processes

Classification: The ability to name and identify sets of objects according to appearances, size or other characteristic. There are two parts to classification. One is sorting things into categories. Your child already groups flowers and animals into two separate categories.

At this stage, they can go one step further. They understand that there are sub-classes within a group, like yellow and red flowers or animals that fly and animals that swim.

Conservation: This is understanding that something can stay the same in quantity even though it looks different. For example, a child understands that when you pour a liquid into different shaped glasses, the amount of liquid stays the same.

Decentering: The child now takes into account multiple aspects of problem to solve it. For example, the child will no longer perceive an exceptionally wide but short cup to contain less than a normally wide, taller cup.

Important Processes

Reversibility: The child now understand that numbers or objects can be changed and then returned to their original state. This involves an understanding that actions can be reversed. Here, your child can figure out that your car is an Audi, an Audi is a car and a car is a vehicle.

Serration: The ability to sort objects in an order according to size, shape, or any other characteristics. Now your child can sort from the tallest to the shortest, or the thinnest to the widest.

Transitivity: Ability to mentally sort objects and recognizes relationship among various things in a serial order. For example, when told to put away his book according to height, the child recognizes that start with placing the tallest one on one end of the bookshelf and the shortest at the other end.

Sociocentricity: This is the characteristic that you've been waiting for! Your child is no longer egocentric and fully focused on themselves. They're able to understand that Mom has her own thoughts, feelings, and timetable.

The Formal Operational Stage (Ages: 12 and Up)

The formal operational stage is the fourth and final stage of [Jean Piaget's](#) theory of [cognitive development](#). It begins at approximately age 12 and lasts into adulthood.

Major Characteristics and Developmental Changes:

- At this stage, the adolescent or young adult begins to think abstractly and reason about hypothetical problems
- Abstract thought emerges
- Teens begin to think more about moral, philosophical, ethical, social, and political issues that require theoretical and abstract reasoning
- Begin to use deductive logic, or reasoning from a general principle to specific information

The Formal Operational Stage

The final stage of Piaget's theory involves an increase in logic, the ability to use deductive reasoning, and an understanding of abstract ideas.³ At this point, people become capable of seeing multiple potential solutions to problems and think more scientifically about the world around them.

It is important to note that Piaget did not view children's intellectual development as a quantitative process; that is, kids do not just add more information and knowledge to their existing knowledge as they get older. Instead, Piaget suggested that there is a *qualitative* change in how children think as they gradually process through these four stages.⁴ A child at age 7 doesn't just have more information about the world than he did at age 2; there is a fundamental change in *how* he thinks about the world.

The Formal Operational Stage

Deductive Logic: Piaget believed that deductive reasoning becomes necessary during the formal operational stage. Deductive logic requires the ability to use a general principle to determine a particular outcome. Science and mathematics often require this type of thinking about hypothetical situations and concepts.

Abstract Thought

While children tend to think very concretely and specifically in earlier stages, the ability to think about abstract concepts emerges during the formal operational stage. Instead of relying solely on previous experiences, children begin to consider possible outcomes and consequences of actions. This type of thinking is important in long-term planning.

Problem-Solving

In earlier stages, children used trial-and-error to [solve problems](#). During the formal operational stage, the ability to systematically solve a problem in a logical and methodical way emerges. Children at the formal operational stage of cognitive development are often able to plan quickly an organized approach to solving a problem.

The Formal Operational Stage

Hypothetical-Deductive Reasoning

Piaget believed that what he referred to as "hypothetical-deductive reasoning" was essential at this stage of intellectual development. At this point, teens become capable of thinking about abstract and hypothetical ideas. They often ponder "what-if" type situations and questions and can think about multiple solutions or possible outcomes.

While kids in the previous stage ([concrete operations](#)) are very particular in their thoughts, kids in the formal operational stage become increasingly abstract in their thinking.