Cognitive Development

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WHAT'S COVERED

This tutorial will discuss cognitive development as well as the cognitive theory of learning. You will explore your problem solving and self and social awareness skill in terms of development and use related to the key areas below. You will do this by focusing on:

1. Cognitive Development and Piaget

Jean Piaget and other cognitive psychologists developed the cognitive theory of learning, which says that people take in information and construct knowledge within minds. Jean Piaget developed the theory of cognitive development and the stages of cognitive development through his studies of children and his interviews with parents at that time.

Piaget's theory of cognitive development states that individuals are active participants in learning and that our brains organize information in different ways. This also means that there are individual differences in learning and mental processes. For example, what I picture when I say the word “chair” might be a little bit different from what you think of as a chair, even though there might be similar sorts of characteristics in both of our concepts “chair.”

TERM TO KNOW

Piaget’s Theory of Cognitive Development

Jean Piaget’s theory of cognitive development explains how children’s mental processes and understanding of the world changes in four stages: sensorimotor, preoperational, concrete operational, and formal operations.

2. Schema

A major part of Piaget’s theory is **schema**. A schema is the basic mental structure where we construct knowledge within our mind, where we take in knowledge, and we put them together in some way.

↱ EXAMPLE You may, for example, have a schema of a chair. There might be individual differences on specifics, but most people have the same idea of what a chair is, such as it having three or four legs, a seat, and a back rest.

Schema can take different kinds of forms, too. It might not just be our ideas of a specific object.

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↱ EXAMPLE We might have stereotypes for different groups of people, or scripts for social situations. For example, it's what you think is likely to occur when you're at a restaurant and a waiter asks what you would like to order. You know what your responses will be; there's a general script for that situation.

World views are general philosophies. When someone says, “everyone only looks out for themselves,” this is a philosophy about people and the way they interact with each other.

Self and Social Awareness: Skill Reflect

Understanding schema helps you confront your biases. These schema have built up over time, but they can changed and be replaced by new ones based on how we interact with the world around us.

TERM TO KNOW

Schema

The basic mental structures around which we construct our knowledge.

3. Assimilation/Accommodation

Knowledge is constructed into schemas in two different ways. First is **assimilation**, which is when we add new information to an existing schema.

↱ EXAMPLE Suppose you have a schema for a chair, and you see a desk chair, one of those wheelie chairs you might find in an office. You would assimilate that information into your existing idea of a chair to say, “That is a chair as well, even if it has some slight differences to it.”

The other way that we construct schema is through **accommodation**. This includes modifying an existing schema or making a new one altogether; it sort of splits up an existing schema.

↱ EXAMPLE Suppose you see a chair and a stool. You might originally have thought of a chair as having only four legs and a back rest. However, when you see a stool, you might say, “Well, that's a chair as well. I'll put it in with the same category, even though it doesn't have a backrest.” When creating a new schema, you might see a chair and a couch. Originally, you might try to categorize that couch as a chair. But then you realize, “That's not a chair at all. Therefore, I'll create a whole new category for couches, so I can differentiate between those two things.”

It's much easier to construct schemas through assimilation and accommodation earlier in your life. Generally, young infants and young children have few schemas. Therefore, they're constantly finding new information in the world and modifying them.

DID YOU KNOW

Children's brains are much more flexible, elastic, and adaptable than an adult's brain.

Later on in life, knowledge can be more solidified with set schemas. It's a lot harder to accommodate them, to create new schemas or modify them. This goes along with the proverb, “You can't teach an old dog new tricks.” Our brains aren't necessarily as elastic when we get older, and often we have set schedules, schemas and scripts for different situations. But, through building our self and social awareness skill, we can break

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down long held stereotypes and biases that may prevent us from truly knowing the people in our lives.

TERMS TO KNOW

Assimilation

Adding new information to an existing schema, or mental pattern.

Accommodation

Either modifying an existing schema to fit new information, or creating a new schema.

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4. Piaget's Theory of Cognitive Development

Piaget's studies of children and his interviews with parents were based on questioning the children and having them perform different problem solving tasks. This research led to Piaget's idea of the four stages of growth, which are essentially supposed to be steps. They are meant to be followed in order: each child goes through each of the following four stages in succession.

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5. The Sensorimotor Stage

The first stage in cognitive growth is the **sensorimotor stage**. The sensorimotor stage occurs from birth up to two years of age. During this period, children are trying to make sense of the world. They don't yet have all of the internal mental constructs, or schemas, needed to help them to sort information about it.

Everything that they know of the world is physical, based on their senses, touching and manipulating things, and their motor skills.

This stage is identified by a lack of **object permanence**, meaning children think if they can't see something it no longer exists.

> ↱ EXAMPLE At this stage, when you play a game of peekaboo, the child doesn't actually know if you're there anymore when you put the blanket up. He or she thinks you've disappeared completely because you're not in sight!

The sensorimotor stage is divided into six sub-stages that illustrate important aspects of this stage:

1. Simple reflexes: Where a child is only able to use the innate skills and abilities that they were born with, things like sucking, or curling fingers or toes.
2. Primary circular reactions: When a child starts to form ideas and focus on what they can do with their bodies, or their bodily reactions. This is when a child tends to repeat actions.

> ↱ EXAMPLE For example, a child might pass their hand over their face over and over to get an idea of what that action is like.

3. Secondary circular reactions: When children are more outwardly focused on the environment and they start to manipulate toys more.
4. Coordination of reactions: When they start to intentionally do things and to combine those reactions, building on the previous stages.
5. Tertiary circular reactions: Where they start to experiment with new actions to see what the results are.

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↱ EXAMPLE Children may start yelling to get attention, to see if that behavior will get the parent to look over at them.

6. Internalization of thoughts: Where children start to create permanent ideas and schemas, and start to use and react to symbols and language.

TERMS TO KNOW

Sensorimotor Stage

Understanding of the world is dependent on sensory and motor interactions (grasping, touching, looking, etc.).

Object Permanence

Around 8 months, infants begin to understand that objects continue to exist even if hidden.

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6. The Preoperational Stage

Piaget's next stage is the **preoperational stage**. The preoperational stage occurs between two and seven years of age. During this time, children start to make their first mental representations of things. These mental representations are very simple in the beginning.

There are several important aspects of this stage:

- **Misunderstanding Transformation**: A child at this stage isn't able to transform objects, which is to say that they can't mentally change the shape or form of something. This means that when children in this stage see something, it's very concrete. They can't imagine what it would look like if you were to move that object around.
- **Intuitive Thought**: Children at this age are very intuitive in their thoughts. This means that children at this stage don't use logic or reasoning when they're trying to figure something out.

  ↱ EXAMPLE Children at this age are not able to understand conservation, which means that they aren't able to tell that there is the same amount of something regardless of what's holding it. This is an experiment Piaget did: he took the same amount of liquid and put it in a tall, narrow glass and a wide, shallow glass. The same amount of liquid in both glasses was seen as being different amounts by children.

- **Egocentric Thought**: Children at this age are very egocentric in their thoughts. At this stage, children are very centered on their individual thoughts and they can't think about others or what others might be thinking at the same time.

  ↱ EXAMPLE This means that, children at this age can't draw a picture from someone else's point of view. If you were to ask them, “What do you think mommy sees?” they wouldn't be able to imagine their mother's perspective; they would only show you what they see themselves.

Self and Social Awareness: Skill Reflect

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You can see beginning of the self and social awareness skill developing in children in this stage. They can't quite grasp a different perspective, but they're getting to know their own.

TERMS TO KNOW

Preoperational Stage
Children begin to make very simple mental operations.

Transformation
Mentally changing an object's shape or form.

Intuitive Thought
Primitive reasoning with logic.

Egocentric Thought
Difficulty perceiving things from another's point of view.

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7. The Concrete Operational Stage

The third stage of development is called the **concrete operational stage**. This stage occurs between 7-11 years of age. During this time, children are able to begin to think logically about concrete events, ones that are very specific to them, though abstract or hypothetical ideas are harder for them to grasp right now.

Problem Solving: Skill Reflect

This stage is where children start to develop the problem solving skills that will take them through adulthood. They can put together puzzles and solve math problems. They are able to come up with solutions for problems that they see and experience.

This stage is identified by several characteristics:

- Children are able to understand **conservation** now. Conservation means that there is the same amount of something, regardless of what kind of container it might be in. Piaget tested conservation through experiments using liquids.

  ↱ EXAMPLE The same amount of liquid was poured into two different containers—one that was very long and narrow and one that was very wide and shallow. Before this stage, the child wasn't able to tell that it was the same amount, but during this stage, they can.

- Children are able to understand reversibility, which is when you reverse certain actions and get the same results.

  ↱ EXAMPLE For example, when you multiply 2 times 3, you get 6. If you multiply 3 times 2, you get 6. The order is reversible.

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- Children are able to use inductive reasoning, which means that they can use a situation or a specific thing to come to a general rule about things. This is a big step toward developing and deepening the problem solving skill.

TERMS TO KNOW

Concrete Operational Stage

Ability to understand some concepts such as transformations and conservation but unable to understand hypothetical or abstract concepts.

Conservation

The concept that weight, mass, and volume of matter can remain the same even if the shape or appearance of the container holding it changes.

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8. The Formal Operations Stage

The final stage in Piaget's theory of cognitive development is the **formal operations stage**.

The formal operations stage is from 11 years old all the way through adulthood. This is when a person reaches full cognitive development and gets the full range of their cognitive abilities and their reasoning. Some important features at this stage are:

- Ability to do deductive reasoning, which children are not able to do at the third stage. Deductive reasoning is the opposite of inductive reasoning, meaning that deductive reasoning gives you a general rule to predict what's going to happen in a situation. At this stage, people are able to take a general rule and predict what's going to happen in the future.
- At this stage, people can create hypotheses. A hypothesis is an educated guess of the outcome of a situation. This refers to the ability to reason that if you do something, then something else will probably happen as a result.
- People can also think abstractly at this point. They can talk about ideas that aren't concrete, like freedom, and can plan for the future. This refers to the ability to think about things that are coming in the future that are a bit more abstract to think about.
- Finally, at this stage, people start to develop empathy, which means understanding what other people are thinking and understanding the people around them better.

Self and Social Awareness: Skill Reflect

Thinking abstractly about other people's points of view and developing empathy for others are hallmark parts of the self and social awareness skills. In this final cognitive develop stage, children and adults are capable of honing this skill to better their understanding of themselves and others.

TERM TO KNOW

Formal Operations Stage

Use of hypothetical, abstract thoughts, symbols, and complex problem solving.

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SUMMARY

This tutorial discussed the stages of **Jean Piaget's theory of cognitive development** which states that individuals are active participants in learning. This learning process includes **schemas** as basic mental structures to put information into context. Schemas are constructed by **assimilation**, adding information to existing knowledge and **accommodation**, creating new categories of information. You explored how you can strengthen your self and social awareness skill by reflecting on your schema and any bias it may cause. You learned that you begin to develop your self and social awareness skill at **the preoperational stage** and your problem solving skill in the **concrete operational stage**. Lastly, you examined how you have a much better-developed self and social awareness skill by the time you reach the **formal operations stage**.

Good luck!

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TERMS TO KNOW

Accommodation
Either modifying an existing schema to fit new information, or creating a new schema.

Assimilation
Adding new information to an existing schema, or mental pattern.

Concrete Operational Stage
Ability to understand some concepts such as transformations and conservation but unable to understand hypothetical or abstract concepts.

Conservation
The concept that weight, mass, and volume of matter can remain the same even if the shape or appearance of the container holding it changes.

Egocentric Thought
Difficulty perceiving things from another's point of view.

Formal Operations Stage
Use of hypothetical, abstract thoughts, symbols, and complex problem solving.

Intuitive Thought
Primitive reasoning with logic.

Object Permanence
Around 8 months, infants begin to understand that objects continue to exist even if hidden.

Piaget's Theory of Cognitive Development
Jean Piaget's theory of cognitive development explains how children's mental processes and understanding of the world changes in four stages: sensorimotor, preoperational, concrete operational,

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and formal operations.

Preoperational Stage

Children begin to make very simple mental operations.

Schema

The basic mental structures around which we construct our knowledge.

Sensorimotor Stage

Understanding of the world is dependent on sensory and motor interactions (grasping, touching, looking, etc.).

Transformation

Mentally changing an object's shape or form.

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