Human Development

Summarization # 1 #

Lectures .. “5”

Preparation by :
AbdulRahman NoorWaly

Written by :
Mohammad Qusha'r – Rashid Almatrafi
Piaget's cognitive-stage theory was the forerunner of today's "cognitive revolution" with its emphasis on mental processes. Piaget, a biologist and philosopher by training, took an organismic perspective.

Piaget viewed cognitive development as the product of children's efforts to understand and act on their world.

Piaget's clinical method combined observation with flexible questioning.

Piaget suggested that cognitive development begins with an inborn ability to adapt to the environment.

Piaget described cognitive development as occurring in four universal, qualitatively different Stages:

1) Sensorimotor Stage.
2) Preoperational Stage.
3) Stage of Concrete Operation.
4) Stage of Formal Operation.

At each stage: cognitive growth occurs through three interrelated processes:
- Organization.
- Adaptation.
- Equilibration

1) لينةو التطورات في عقل: تحدث أول مرحلة في أول سنتين من العمر.
2) التكيف {assumulation, accumalition}
**Organization:** is the tendency to create increasingly complex cognitive structures (systems of knowledge or ways of thinking that incorporate more and more accurate images of reality). These structures, called Schemes (المعرفة المتزايدة)

**Schemes:** are organized patterns of behavior that a person uses to think about and act in a situation. (التفكير بطريقة معينة)

Or

It is Piaget's term for organized patterns of behavior used in particular situations.

As children acquire more information, their schemes become more and more complex. e.g. An infant has a simple scheme for sucking but soon develops varied schemes for how to suck at the breast, a bottle, or a thumb.

**Adaptation:** is Piaget's term for how children handle new information in light of what they already know.

Adaptation occurs through two complementary processes:

1. **Assimilation:** taking in new information and incorporating it into existing cognitive structures.

2. **Accommodation:** adjusting one's cognitive structures to fit the new information.

**Equilibration:** a constant striving for a stable balance, or equilibrium, dictates the shift from assimilation to accommodation.

When children cannot handle new experiences within their existing cognitive structures and thus experience disequilibrium, they organize new mental patterns that integrate the new experience, thus restoring a more comfortable state of equilibrium.

<table>
<thead>
<tr>
<th>organization</th>
<th>adaptation</th>
<th>Equilibrium</th>
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<tbody>
<tr>
<td>ان الإنسان ردين قابلية للمعرفة ولديه مكان لها.</td>
<td>Assimilation</td>
<td>أدور للمعرفة في القديم والجديد بين أوصل للحل يأتى لأتفقي اللفشها أو أتفقي أتحفها في لفش جديد.</td>
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<td>معروفة جديد</td>
<td>Accommodation</td>
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The Sensorimotor Stage
(birth to approximately age 2).

The first of Piaget’s four stages of cognitive development is the sensorimotor stage.
During this stage, infants learn about themselves and their world through their developing sensory and motor activity.
Babies change from creatures who respond primarily through reflexes and random behavior into goal-oriented toddlers.

The sensorimotor stage consists of six substages, which flow from one to another as a baby’s schemes, organized patterns of behavior, become more elaborate.
During the first five sub-stages, babies learn to coordinate input from their senses and organize their activities in relation to their environment. They do this by the processes of organization, adaptation, and equilibration, discussed.
During the sixth (last sub-stage), they progress from trial and error learning to the use of symbols and concepts to solve simple problems.

Much of this early cognitive growth comes about through circular reactions. In which
- An infant learns to reproduce pleasurable or interesting events originally discovered by chance.
- Initially, an activity produces a sensation so enjoyable that the baby wants to repeat it.
- The repetition again produces pleasure, which, in turn, motivates another repetition.
- The originally chance behavior has been consolidated into a new scheme.

احساس حركة
أول شي ينمو معرفيا لدى الانسان يكون عن طريق الاحساس
"reflex"
الطفل في البداية يكون اعتماده علي

المرحلة الاولى هذه تدعي علي 6 مراحل:
أول 5 مراحل يحاول وتجرب
المرحلة السادسه يكون له هدف يعمل عليه

المرحلة السادسه

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Circular reactions: هي عمل شيء واعجاب فيه ثم تكراره
The sensorimotor six substages:

The first substage: Use of reflexes (Birth to 1 month)

المراحل الـ6: أول شهار يعتمد على الرفلكس .. في أول شهر

- Infants exercise their inborn reflexes and gain some control over them.
- They do not coordinate information from their senses.
- They do not grasp an object they are looking at.
- e.g: Baby begins sucking when her mother's breast is in her mouth.

The second substage: Primary circular reactions (about 1 to 4 months).

- Infants repeat pleasurable behaviors that first occur by chance (such as thumb sucking).
- Activities focus on the infant's body rather than the effects of the behavior on the environment.
- Infants make first acquired adaptations; that is, they suck different objects differently.
- They begin to coordinate sensory information and grasp objects.
- e.g: when given a bottle, Baby, who is usually breastfed, is able to adjust his sucking to the rubber nipple.

Circular reactions: Piaget's term for processes by which an infant learns to reproduce desired occurrences originally discovered by chance.

The third substage: Secondary circular reactions (about 4 to 8 months).

- It coincides with a new interest in manipulating objects and learning about their properties.
- Babies intentionally repeat an action not merely for its own sake, as in the second substage, but to get results beyond the infant's own body.
- Infants become more interested in the environment; they repeat actions that bring interesting results (such as shaking a rattle) and prolong interesting experiences.
- Actions are intentional but not initially goal directed.
- e.g: Baby pushes pieces of dry cereal over the edge of his high chair tray one at a time and watches each piece as it falls to the floor.
The fourth substage:
Coordination of secondary schemes (about 8 to 12 months).
- They have learned to generalize from past experience to solve new problems.
- Behavior is more deliberate and purposeful (intentional) as infants coordinate previously learned schemes (such as looking at and grasping a rattle) and use previously learned behaviors to attain their goals (such as crawling across the room to get a desired toy).
- They can anticipate events.
- e.g: Baby pushes the button on his musical nursery rhyme book, and "Twinkle, Twinkle, Little Star" plays. She pushes this button over and over again, choosing it instead of the buttons for the other songs.

The fifth substage:
Tertiary circular reactions (about 12 to 18 months).
- Babies will vary an action to get a similar result.
- Toddlers show curiosity and experimentation; they purposefully vary their actions to see results (for example, by shaking different rattles to hear their sounds).
- They actively explore their world to determine what is novel about an object, event, or situation.
- They try out new activities and use trial and error in solving problems.
- e.g: When Baby's big sister holds his favorite board book up to his crib bars, he reaches for it. His first efforts to bring the book into his crib fail because the book is too wide. Soon, baby turns the book sideways and hugs it, delighted with his success.

The sixth substage:
Mental combinations (about 18 months to 2 years).
- It is a transition to the preoperational stage of early childhood.
- They can pretend, and their representational ability affects the sophistication of their pretending.
- Representational ability: the ability to mentally represent objects and actions in memory, largely through symbols such as words, numbers, and mental pictures, frees children from immediate experience.
- Also, Representational ability: Piaget's term for capacity to store mental images or symbols of objects and events.
- They can think about actions before taking them.
They no longer have to go through laborious trial and error to solve problems.

Since toddlers can mentally represent events, they are no longer confined to trial and error to solve problems. Symbolic thought enables toddlers to begin to think about events and anticipate their consequences without always resorting to action.

Toddlers begin to demonstrate insight.

They can use symbols, such as gestures and words, and can pretend. e.g: Baby plays with her shape box, searching carefully for the right hole for each shape before trying and succeeding.

During these six substages, infants develop:
- The abilities to think and remember.
- Knowledge about certain aspects of the physical world, notably, about objects and spatial relationships.

Researchers following in Piaget’s footsteps have found that some of these developments conform fairly closely to his observations, but others, including representational ability, may occur earlier than Piaget believed possible.

Key Development of the sensorimotor stage.

1
Concept or Skill: Object permanence
Piaget’s View: It develops gradually between the third and sixth substage. Infants in the fourth substage (8-12 months).
More Recent Findings: Infants as young as 3.5 months (second substage) seem to show object knowledge, though interpretation of findings is in dispute.

2
Concept or Skill: Spatial knowledge Piaget’s View: Development of object concept and spatial knowledge is linked to self-locomotion and coordination of visual and motor information.
More Recent Findings: Research supports Piaget’s timetable and the relationship of spatial judgments to the decline of egocentrism. Link to motor development is less clear.
3

Concept or Skill: Causality
Piaget's View: It develops slowly between 4-6 months and 1 year, based on an infant’s discovery, first of effects of own actions and then of effects of outside forces.
More Recent Findings: Some evidence suggests early awareness of specific causal events in the physical world, but general understanding of causality may be slower to develop.

4

Concept or Skill: Number
Piaget's View: It depends on use of symbols, which begins in the sixth substage (18-24 months).
More Recent Findings: Infants as young as 5 months may recognize and mentally manipulate small numbers, but interpretation of findings is in dispute.

5

Concept or Skill: Categorization
Piaget's View: It depends on representational thinking, which develops during the sixth substage (18-24 months).
More Recent Findings: Infants as young as 3 months seem to recognize perceptual categories, and 7-month-olds categorize by function.

6

Concept or Skill: Imitation
Piaget's View: Invisible imitation develops around 9 months; deferred imitation begins after development of mental representations in the sixth substage (18-24 months).
More Recent Findings: Controversial studies have found invisible imitation of facial expressions in newborns and deferred imitation as early as 6 weeks. Deferred imitation of complex activities seems to exist as early as 6 months.
Invisible imitation: Imitation with parts of one's body that one cannot see.

Visible imitation: Imitation with parts of one's body that one can see.

Deferred imitation: Piaget's term for reproduction of an observed behavior after the passage of time by calling up a stored symbol of it.

Elicited imitation: Research method in which infants or toddlers are induced to imitate a specific series of actions they have seen but not necessarily done before.

Four factors seem to determine young children's long-term recall:
1. the number of times a sequence of events has been experienced,
2. whether the child actively participates or merely observes,
3. whether the child is given verbal reminders of the experience, and
4. whether the sequence of events occurs in a logical, causal order (Bauer et al., 2000).

The preoperational stage (2-7 years)

- Preoperational stage In Piaget's theory, the second major stage of cognitive development, in which children become more sophisticated in their use of symbolic thought but are not yet able to use logic.
- Jean Piaget called early childhood (the preoperational stage of cognitive development) because children this age are not yet ready to engage in logical mental operations, as they will be in the stage of concrete operations in middle childhood.
- However, the preoperational stage, which lasts from approximately ages 2 to 7, is characterized by a great expansion in the use of symbolic thought, or representational ability, which first emerges at the end of the sensorimotor stage.
Cognitive Advances during early childhood

1- Skill: Use of symbols
Symbolic function: is the Piaget’s term for ability to use mental representations (words, numbers, or images) to which a child has attached meaning.
pretend play: is the Play involving imaginary people and situations; also called fantasy play, dramatic play, or imaginative play.

Significance:
- Children do not need to be in sensorimotor contact with an object, person, or event in order to think about it.
- Children can imagine that objects or people have properties other than those they actually have.

Example:
- Child asks his mother about the elephants they saw on their trip to the circus several months earlier.
- Child pretends that a slice of apple is a vacuum cleaner “rooming” across the kitchen table.

2- Skill: Understanding of identities
Significance:
- Children are aware that superficial alterations do not change the nature of things.

Example:
- Child knows that his teacher is dressed up as a pirate but is still his teacher underneath the costume.

3- Skill: Understanding of cause and effect
Significance:
- Children realize that events have causes.
Example:
- Seeing a ball roll from behind a wall, child looks behind the wall for the person who kicked the ball.
4- 
Skill: Ability to classify
Significance: Children organize objects, people, and events into meaningful categories.
Example: Child sorts the pine cones she collected on a nature walk into two piles according to their size: "big" and "little.

5- 
Skill: Understand of number
Significance: Children can count and deal with quantities.
Example: Child shares some candy with her friends, counting to make sure that each girl gets the same amount.

6- 
Skill: Empathy
Significance: Children become more able to imagine how others might feel.
Example: Child tries to comfort his friend when he sees that his friend is upset.

7- 
Skill: Theory of mind
Significance: Children become more aware of mental activity and the functioning of the mind.
Example: Child wants to save some cookies for herself, so she hides them from her brother in a pasta box. She knows her cookies will be safe there because her brother will not look in a place where he doesn't expect to find cookies.
Immature Aspects of Preoperational Thought (According to Piaget):

1-
Limitation: Limitation
Centration
Description: - Centration In Piaget's theory, is the tendency of preoperational children to focus on one aspect of a situation and neglect others.
- Decenter In Piaget's terminology, to think simultaneously about several aspects of a situation.
- The inability to decenter, Children focus on one aspect of a situation and neglect others.
Example: - Child teases his younger sister that he has more juice than she does because his juice box has been poured into a tall, skinny glass, but hers has been poured into a short, wide glass.

2-
Limitation: Irreversibility
Description:
- Children fail to understand that some operations or actions can be reversed, restoring the original situation.
Example: - Child does not realize that the juice in each glass can be poured back into the juice box from which it came, contradicting his claim that he has more than his sister.

3-
Limitation: Focus on states rather than transformations.
Description:
- Children fail to understand the significance of the transformation between states.
- **Conservation**: is the Piaget’s term for awareness that two objects that are equal according to a certain measure remain equal in the face of perceptual alteration so long as nothing has been added to or taken away from either object.

- **Horizontal decalage**: is the Piaget’s term for inability to transfer learning about one type of conservation to other types, which causes a child to master different types of conservation tasks at different levels.

**Example:**
- In the conservation task, child does not understand that transforming the shape of a liquid (pouring it from one container into another) does not change the amount.

4-
**Limitation**
**Transductive reasoning**
**Description:**
- **Transduction**: is the Piaget’s term for a preoperational child's tendency to mentally link particular phenomena, whether or not there is logically a causal relationship.
- Children do not use deductive or inductive reasoning; instead they jump from one particular to another and see cause where none exists.

**Example:**
- A child was mean to his brother. Then his brother got sick. The child concludes that he made her brother sick.

5-
**Limitation**
**Egocentrism**
**Description:**
- **Egocentrism**: is the Piaget’s term for inability to consider another person’s point of view; a characteristic of young children's thought.
- Children assume everyone else thinks, perceives, and feels as they do.

**Example:**
- Child doesn’t realize that he needs to turn a book around so that his father can see the picture he is asking him to explain to him. Instead, he holds the book directly in front of him, where only he can see it.
6-
Limitation
Animism
Description:
- Animism: is the Tendency to attribute life to objects that are not alive.
- Children attribute life to objects not alive.
Example:
- Child says that spring is trying to come but winter is saying, "I won't go! I won't go!"

"الشمس قالت لي ..، القطط قالت لي.."

7-
Limitation:
Inability to distinguish appearance from reality
Description:
- Children confuse what is real with outward appearance.
Example:
- Child is confused by a sponge made to look like a rock. He states that it looks like a rock and it really is a rock.

"ماقدر يفرق بين الصوره والحقيقة، السفنجه مثلا يقول عنها صخره"

The concrete operational (7-12 years)

- According to Piaget, children enter the stage of concrete operations when they can use mental operations, such as reasoning, to solve concrete (actual) problems, such as where to find a missing mitten.
- Children at this age can think logically because they are less egocentric than before and can take multiple aspects of a situation into account.

The concrete operational (7-12 years)

- However, their thinking is still limited to real situations in the here and now.
- During this stage children develop logical but not abstract thinking.
- Cognitive Advances: In the stage of concrete operations, children have a better understanding than pre-operational children of spatial concepts, causality, categorization, inductive and deductive reasoning, conservation, and number.

Advances in Selected Cognitive Abilities During Middle Childhood:
1-
Ability:
*Spatial thinking*
Example:
- Child can use a map or model to help his search for a hidden object and can give someone else directions for finding the object.
- He can find her way to and from school, can estimate distances, and can judge how long it will take her to go from one place to another.

Advances in Selected Cognitive Abilities During Middle Childhood:

2-
Ability:
Cause and effect
Example:
- Child knows which physical attributes of objects on each side of a balance scale will affect the result (i.e., number of objects matters but color does not).
- He does not yet know which spatial factors, such as position and placement of the objects, make a difference.

3-
Ability:
Categorization
Example:
- Child can sort objects into categories, such as shape, color or both. She knows that a subclass (roses) has fewer members than the class of which it is a part (flowers).

4-
Ability:
Seriation and transitive Inference
Example:
- Child can arrange a group of sticks in order, from the shortest to the longest, and can insert an intermediate-size stick into the proper place.
- He knows that if one stick is longer than a second stick, and the second stick is longer than a third, then the first stick is longer than the third.

5-
Ability:
Inductive and deductive reasoning
Example:
- Child can solve both inductive and deductive problems and knows that inductive conclusions (based on particular premises) are less certain.
Seriation: is the ability to order items along a dimension.

Transitive inference: is the understanding of the relationship between two objects by knowing the relationship of each to a third object.

Class inclusion: is the understanding of the relationship between a whole and its parts.

Inductive reasoning: Type of logical reasoning that moves from particular observations about members of a class to a general conclusion about that class. "particular to general"

Deductive reasoning: Type of logical reasoning that moves from a general premise about a class to a conclusion about a particular member or members of the class. "general to particular"

6-

Ability:

Conservation

Example:
- Child, at age 7, knows that if a clay ball is rolled into a sausage, it still contains the same amount of clay (conservation of substance). At age 9, he knows that the ball and the sausage weigh the same.
- Not until early adolescence will he understand that they displace the same amount of liquid if dropped in a glass of water.

7-

Ability:

Number and mathematics

Example:
- Child can count in his head, can add by counting up from the smaller number, and can do simple story problems.

The of Formal Operations (12years-onward)

According to Piaget, adolescents enter the highest level of cognitive development (formal operations) when they develop the capacity for abstract thought.

This development, usually around age 11, gives them a new, more flexible way to manipulate information.

No longer limited to the here and now, they can understand historical time and extraterrestrial space.
The of Formal Operations (12 years-onward)

- They can use symbols for symbols (for example, letting the letter X stand for an unknown numeral) and thus can learn algebra and calculus.
- They can better appreciate metaphor and allegory and thus can find richer meanings in literature.
- They can think in terms of what might be, not just what is.
- They can imagine possibilities and can form and test hypotheses.

"الدولة X، الشخص Y"

- The ability to think abstractly has emotional implications. Earlier, a child could love a parent or hate a classmate.
- Now "the adolescent can love freedom or hate exploitation. slavery . . . The possible and the ideal captivate both mind and feeling“
- Formal operations Piaget's final stage of cognitive development, characterized by the ability to think abstractly.
- Hypothetical-Deductive reasoning: is the ability, believed by Piaget to accompany the stage of formal operations, to develop, consider, and test hypotheses.

Hypothetical-Deductive Reasoning:

- To appreciate the difference formal reasoning makes, let's follow the progress of a typical child in dealing with a classic Piagetian problem, the pendulum problem.
- The child, Adam, is shown the pendulum (an object hanging from a string). He is then shown how he can change any of four factors: the length of the string, the weight of the object, the height from which the object is released, and the amount of force he may use to push the object.

Hypothetical-Deductive Reasoning:

- He is asked to figure out which factor or combination of factors determines how fast the pendulum swings.
- Pendulum. The pendulum’s string can be shortened or lengthened, and weights of varying sizes can be attached to it.
- The student must determine what variables affect the speed of the pendulum’s swing.