Session 8: Cognitive Development in Middle & Late Childhood
Characteristics of Concrete Operational Thought

- Can use operations, mentally reversing actions; shows conservation skills and decentering
- Logical reasoning replaces intuitive reasoning, but only in concrete circumstances
- Inductive reasoning – a logical process in which multiple premises are thought to be true based on personal experience
- Classification skills – can divide things into sets and subsets and reason about their interrelations
- Not abstract – e.g., can’t imagine steps in algebraic equation
Characteristics of Concrete Operational Thought

- Seriation
- Transitivity
- Classification
- Identity
- Decentering
- Conservation
- Reversibility

Concrete Operations
Decentering

- Ability to take into account multiple pieces of information simultaneously
Conservation

- Ability to determine that a certain quantity will remain the same despite adjustment of the container, shape, or apparent size
Conservation

- Is this child conserving?

"Cut it into a LOT of slices, Mom. I am REALLY hungry!"
## Conservation Tasks

<table>
<thead>
<tr>
<th>Type of conservation</th>
<th>Initial Presentation</th>
<th>Manipulation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>Two identical rows of objects are shown to the child, who agrees they have the same number.</td>
<td>One row is lengthened and the child is asked whether one row now has more objects.</td>
</tr>
<tr>
<td><strong>Matter</strong></td>
<td>Two identical balls of clay are shown to the child. The child agrees that they are equal.</td>
<td>The experimenter changes the shape of one of the balls and asks the child whether they still contain equal amounts of clay.</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>Two sticks are aligned in front of the child. The child agrees that they are the same length.</td>
<td>The experimenter moves one stick to the right, then asks the child if they are equal in length.</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>Two balls are placed in two identical glasses with an equal amount of water. The child sees the balls displace equal amounts of water.</td>
<td>The experimenter changes the shape of one of the balls and asks the child if it still will displace the same amount of water.</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td>Two identical sheets of cardboard have wooden blocks placed on them in identical positions. The child agrees that the same amount of space is left on each piece of cardboard.</td>
<td>The experimenter scatters the blocks on one piece of cardboard and then asks the child if one of the cardboard pieces has more space covered.</td>
</tr>
</tbody>
</table>
Reversibility

- Ability to recognize that numbers or objects can be changed and returned to their original condition
Classification

- Ability to simultaneously sort things into general and more specific groups, using different types of comparisons

Animals

Are there more dogs or cats?
Are there more dogs or animals?
Hierarchical Classification

Are there more daisies or flowers?
Seriation

- Ability to sort objects or situations according to any characteristic, such as size, color, shape, or type
Transitivity

- Ability to recognize relationships among various things in a serial order
Identity

- Objects have qualities that do not change even if the object is altered in some way (e.g., rearranging or rotating it)
When a Child Fails a Piagetian Task
Why?

*Piaget:* The Child Lacks Relevant Cognitive Skills

*Alternative View:* Piaget’s Method Underestimates the Child’s Skills

*Perhaps* - the instructions/question are not clear
- the materials are unfamiliar/novel
- child fails to attend to significant factors
- there is a memory problem
- child performs better in real world context
Increase in Information Processing Skills

- Working Memory
- Attention
- Memory Strategies
Deficiencies in the Use of Memory Strategies

- Mediation deficiency
- Production deficiency
- Utilization deficiency
Long-Term Memory Systems

**Procedural Memory**
- Procedural memory stands for mechanical or motor-related skills.

**Priming**
- Priming means a higher probability of recognizing previously perceived information.

**Perceptual Memory**
- Perceptual memory refers to the recognition of stimuli and is related to familiarity judgements.

**Semantic Memory**
- Semantic memory is oriented to the present and represents general context-free facts.

**Episodic-Autobiographical Memory**
- EAM is the conjunction of subjective time, autonoetic consciousness, and the experiencing self.

Examples:
- **My first date with Jane**
- **The birth of Marcel**
- **H₂O = water**
  - a²+b² = c²
  - Paris = capital of France
Memory Development

Improves with age due to several cognitive changes:

1. Processing speed
2. Breadth and depth of knowledge
3. Logical thinking skills
4. Language skills
Increase in Information Processing Skills...

- Knowledge base
- Metacognition
- Critical thinking
Theories of Intelligence

- General intelligence factor (g)
WISC-V Subtests

Verbal Comprehension
- Similarities
- Vocabulary

Visual-Spatial
- Block Design

Fluid Reasoning
- Matrix Reasoning

Working Memory
- Digit Span

Processing Speed
- Coding
Triarchic Theory

- Analytical intelligence
- Creative intelligence
- Practical intelligence
Multiple Intelligence Theory
Disability

- Intellectual Disability
- Dyslexia
- Dysgraphia
- Dyscalculia
Cultural Behaviors in the Classroom

- Eye contact
- When to speak
- Social distance
- Wait time
- Cooperative vs. competitive activities