3 Explanations of Cognitive Development in Infancy/Toddlerhood

1. Piaget
2. Information Processing
3. Vygotsky

Building Schemes—2 processes

2. Adaptation
   - Building schemes through direct interaction with the environment
     - Assimilation—incorporate into
       - Using current schemes to interpret external world
         - I.e. when child drops objects, assimilate it into “dropping scheme”
     - Accommodation—change
       - Adjusting old schemes and creating new ones to better fit environment
         - I.e. when drop objects in different ways, modify “dropping scheme” to take account of varied proportions of objects
     - Equilibrium
       - Use assimilation rather than accommodation during equilibrium when not changing much
     - Disequilibrium
       - Disequilibrium prompts accommodation more than assimilation during rapid cognitive change

Using Assimilation and Accommodation

2. Organization
   - Internal process away from direct interaction with the environment
   - Once form new schemes, rearrange them and linking them with schemes to create a strongly interconnected cognitive system
     - I.e. relate “dropping” to “throwing” and develop understanding of “nearness” and “farness”
Sensorimotor Stage (0-2 years)

- Building schemes through sensory and motor exploration
- Circular reactions—stumbling onto a new experience during motor activity and trying to repeat it

Object Permanence

- Understanding that objects continue to exist when out of sight
- According to Piaget, develops in Substage 4.
- Incomplete at first: **A-not-B Error**—continuing to search for object in first hiding place even though saw it moved to second hiding place

Mental Representations

- Internal, mental depictions of objects, people, events, information
  - Can manipulate with mind
  - Allows **deferred imitation**—remember and copy others not present
  - Allows make-believe play—acting out everyday and imaginary activities

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Violation of Expectations Method

**V-O-E** M—Habituate (gradual reduction of strength of a response as result of repetitive stimulation) babies to a physical event. Do babies “recover” (look longer at) a **possible event** (variation of first event that follows physical laws) or an **impossible event** (variation that violates physical laws). Recovery to the impossible event suggests the infant is surprised at the deviation from physical reality.
Evaluation of the Sensorimotor Stage

| Develop when Piaget suggested | • Object search  
| • A-not-B  
| • Make-believe play |
| Develop earlier than Piaget suggested | • Object permanence  
| • Deferred imitation  
| • Categorization  
| • Problem solving by analogy |

Some suggest infants are born with core knowledge in several domains of thought

Information-Processing Improvements

| Attention | • Efficiency, ability to shift focus improve  
| • Less attraction to novelty, better sustained attention after first year |
| Memory | • Retention intervals lengthen  
| • Recall appears by 1 year; excellent in second year |
| Categorization | • Impressive perceptual categorization in first year  
| • Conceptual categorization in second year |

Deferred Imitation

- **Piaget**: Develops about 18 months
- **Newer research**:
  - 6 weeks – facial imitation
  - 6 – 9 months – copy actions with objects
  - 12 – 14 months – imitate rationally
  - 18 months – imitate intended, but not completed, actions

Infants’ Numerical Knowledge

- Infants may be able to:
  - Discriminate quantities up to 3
  - Do simple arithmetic
  - Findings are controversial
3. Vygotsky's Sociocultural Theory

- Social contexts (other people) contribute to cognitive development
- Zone of Proximal (Potential) Development – range of tasks child cannot do alone but can learn to do with help of more skilled partners (peers, teachers, parents, siblings, etc.)
- Will focus more on Vygotsky later

Getting Ready to Talk

- First speech sounds
  - Cooing
  - Babbling
- Becoming a communicator
  - Joint attention—adults labeling what infant sees
  - Give-and-take—turn-taking games like peekaboo
  - Preverbal gestures—pointing

Three Theories of Language Development

| Behaviorist (Skinner) (nurture) | Learned through operant conditioning—reinforcement of imitation
| Nativist (Chomsky) (nature) | Inborn Language Acquisition Device (LAD) biologically prepares infants to learn rules of language
| Interactionist (Various) (nature and nurture interaction) | Interaction between inner capacities and environmental influences; social context is important; modified Chomsky—children primed to acquire language (nature), but its structure is based on experiences with language (nurture) |

Starting to Talk

- Comprehend more words than they can produce or remember to say
- First Words
  - Underextension—applying word too narrowly
    - “Bear” as personal teddy bear
  - Overextension—applying word too generally
    - “Car” as bus, train, truck, or fire engine
- Two-Word Utterances
  - Telegraphic Speech—leaving out smaller words like a telegram
    - Want+X or More+X
Individual Differences in Language Development

- Environment
  - Child Directed Speech—short sentences with high-pitched, exaggerated expression, clear pronunciation, distinct pauses between speech segments, and repetition of new words in a variety of contexts.

- Gender
- Personality

- Language Style
  - Referential—words referring to objects
  - Expressive—pronouns and social formulas
    - “stop it,” “thank you,” “I want it”

- Language Delay

Supporting Early Language Learning

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<thead>
<tr>
<th>Infants</th>
<th>Toddlers</th>
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<tbody>
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<td>Respond to coos and babbles</td>
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