Chapter 7: Cognitive Development during the First Three Years

Prepared by Debbie Laffranchini
From Papalia, Olds, and Feldman
Studying Cognitive Development: Six Approaches

- Behavioral
- Psychometric
- Piagetian
- Information-processing
- Cognitive Neuroscience
- Social-Contextual
Studying Cognitive Development: Six Approaches

- **Behaviorist approach** studies the mechanics of learning, how behavior changes in response to experience.
- **Psychometric approach** measures quantitative differences.
- **Piagetian approach** looks at changes or stages in the quality of cognitive functioning.
- **Information-processing approach** focuses on the processes involved in perception, learning, memory, and problem solving.
- **Cognitive neuroscience approach** looks at the “hardware” of the central nervous system, identifying brain structures involved in specific aspects of cognition.
- **Social-contextual approach** looks at the influence of the environment, particularly parents and caregivers.
Behaviorist Approach:
Basic Mechanics of Learning

- Classical and Operant Conditioning
- Infant Memory
Classical Conditioning

- Learner is passive and automatically reacts to a stimulus
- If learning is not reinforced, the learning becomes “extinct”, fades
Classical Conditioning

**Stage 1:** Before conditioning
- Camera
- Child does not blink

**Stage 2:** Conditioning
- Flashbulb (UCS) and camera
- Child blinks

**Stage 3:** After conditioning
- Camera
- Child blinks

Neutral stimulus does not produce blinking.

UCS (unconditional stimulus) is paired with neutral stimulus. UCS produces UCR (unconditional response).

Neutral stimulus (camera) is now the conditioned stimulus. It produces a CR, blinking, which is like the UCR produced by the flashbulb.
Operant Conditioning

• Learner acts on the environment
• Learning based on reinforcement or punishment
Infant Memory

• Infantile amnesia: inability to remember early events

• Developmental scientists suggest:
  – Piaget: brain is not developed enough to store memories
  – Freud: early memories are repressed because they are emotionally troubling
  – Others: children need to talk before they can store memories
  – Rovee-Collier: infant memories are similar to adults but needs frequent reminders

• Infancy is a time of great changes and retaining memories for long is not useful
Retention Improves with Age

- The graph shows the maximum number of weeks infants of various ages show retention of how to operate either a mobile or a miniature train.
Psychometric Approach: Developmental and Intelligence Testing

- Testing infants & Toddlers
- Assessing the Impact of the Home Environment
- Early Intervention
Testing Infants & Toddlers

• Intelligent behavior is goal-oriented and adaptive
  – Infant: I want that ball in your hand and will try to open your hand to get the ball

• French psychologist Binet developed a measurement tool to identify children who could not handle academic work and needed special instruction

• Psychometric tests measure quantitative factors such as comprehension and reasoning
  – IQ tests measure abilities compared to peers

• Infants are not good test takers: lose interest, don’t feel like doing it, don’t know what’s expected of them, or don’t know how
• Bayley Scales of Infant and Toddler Development (Bayley-III)
  – Assesses children 1 month to 3.5 years
  – Indicates child’s strengths and weaknesses
  – 5 developmental areas:
    • Cognitive
    • Language
    • Motor
    • Social-emotional
    • Adaptive behavior
  – Optional Behavior Rating Scale
  – Developmental Quotients calculated for each scale
    • Useful for early detection of emotional disturbances and sensory, neurological, and environmental deficits and helping parents and professionals plan for a child’s needs
Assessing the Impact of the Home Environment

- HOME: Home Observation for Measurement of the Environment
  - Yes/no checklist for intellectual stimulation and support observed in child’s home
  - Infants/toddlers observation lasts one hour
  - Under age 2, scores are correlated with cognitive development
  - Parent responsiveness, number of books in home, presence of appropriate toys, parent involvement in children’s play
    - Passive genotype-environment correlation
Assessing the Impact of the Home Environment (cont)

- HOME: 7 aspects of early home environment that enables cognitive and psychosocial development and helps children be prepared for school
  - Encouraging exploration of the environment
  - Mentoring in basic cognitive and social skills
  - Celebrating developmental advances
  - Guidance in practicing and extending skills
  - Protection from inappropriate disapproval, teasing, and punishment
  - Communicating richly and responsively
  - Guiding and limiting behavior
    - Consistent presence of all seven aspects early in life is causally linked to many areas of brain functioning and cognitive development
<table>
<thead>
<tr>
<th>Name of Subscale</th>
<th>Description</th>
<th>Example Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional and verbal responsivity of the primary caregiver (items 1–11)</td>
<td>The communicative and affective interactions between the caregiver and the child</td>
<td>Mother spontaneously vocalizes to the child at least twice during visit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mother caresses or kisses child at least once during visit</td>
</tr>
<tr>
<td>Avoidance of restriction and punishment (items 12–19)</td>
<td>How the adult disciplines the child</td>
<td>Primary caregiver (PC) does not shout at child during visit</td>
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<tr>
<td></td>
<td></td>
<td>PC does not express overt annoyance with or hostility toward the child</td>
</tr>
<tr>
<td>Organization of the physical and temporal environment (items 20–25)</td>
<td>How the child's time is organized outside the family house. What the child's personal space looks like</td>
<td>When PC is away, care is provided by one of three regular substitutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The child's play environment appears safe and free of hazards</td>
</tr>
<tr>
<td>Provision of appropriate play materials (items 26–34)</td>
<td>Presence of several types of toys available to the child and appropriate for his/her age</td>
<td>Child has one or more large muscle activity toys or pieces of equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides equipment appropriate to age, such as infant seat, infant rocker, playpen</td>
</tr>
<tr>
<td>Parental involvement with the child (items 35–40)</td>
<td>How the adult interacts physically with the child</td>
<td>PC tends to keep child within visual range and look at him/her often</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC talks to child while doing her work</td>
</tr>
<tr>
<td>Opportunities for variety in daily stimulation (items 40–45)</td>
<td>The way the child's daily routine is designed to incorporate social meetings with people other than the mother</td>
<td>Father provides some care-giving every day. Family visits or receives visits from relatives approximately once a month</td>
</tr>
</tbody>
</table>

Early Intervention

• Children with limited learning opportunities early in life begin kindergarten at least 2 years behind peers and unlikely to catch up without special help

• Individuals with Disabilities Education Act (IDEA) EI (early intervention) plans and provides therapeutic and educational services to children with developmental needs

• Research: children who received EI had higher IQs than not only peers but children who needed EI but did not receive it (control group) at age 3
  – Significantly more likely to be employed at age 21 (70% compared to 40% of control group)
  – 3 times more likely to attend 4-year college
  – Less likely to experience teen pregnancy, smoke, or use drugs
Early Intervention (cont)

- EI can offset environmental risks
- Most effective EI:
  - Begins early and continues throughout preschool
  - Highly time-intensive (more hours, more days)
  - Center-based, direct educational experiences, not just parental training
  - Comprehensive approach, including health, family counseling, social services
  - Tailored to individual differences and needs
Piagetian Approach: The Sensorimotor Stage

• Substages of the Sensorimotor Stage
• Do Imitative Abilities Develop Earlier than Piaget thought?
• Development of Knowledge about Objects and Space
• Evaluating Piaget’s Sensorimotor Stage
Sensorimotor Substages

- 6 substages
- Schemes are organized patterns of thought and behavior
- Schemes become more elaborate
- First 5 substages baby coordinates input from senses (things seen, heard, smelled, tasted, touched)
  - Organization
  - Adaptation
  - Equilibration
- Early cognitive growth is result of circular reactions (simple to complex)
Sensorimotor Substages

- **Stage 1**: reflexive (1 month)
- **Stage 2**: action on body, sucking (1 – 4 months)
- **Stage 3**: action on object, rattle (4 – 8 months)
- **Stage 4**: complex, goal-directed behavior, combining objects, hit a pot with a spoon (8 – 12 months) *First sign of intelligence*
- **Stage 5**: experimenter, what else can I do with this? (12 – 18 months)
- **Stage 6**: represent mentally: language, manipulate symbols (words, numbers, mental pictures), pretend (18 – 24 months)
### Table 7-3: Six Substages of Piaget’s Sensorimotor Stage of Cognitive Development

<table>
<thead>
<tr>
<th>Substages</th>
<th>Ages</th>
<th>Description</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use of reflexes</td>
<td>Birth to 1 month</td>
<td>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.</td>
<td>Dorri begins sucking when her mother’s breast is in her mouth.</td>
</tr>
<tr>
<td>2. Primary circular reactions</td>
<td>1 to 4 months</td>
<td>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.</td>
<td>When given a bottle, Dylan, who is usually breast-fed, is able to adjust his sucking to the rubber nipple.</td>
</tr>
<tr>
<td>3. Secondary circular reactions</td>
<td>4 to 8 months</td>
<td>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.</td>
<td>Alejandro 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.</td>
</tr>
<tr>
<td>4. Coordination of secondary schemes</td>
<td>8 to 12 months</td>
<td>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.</td>
<td>Anica pushes the button on her 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.</td>
</tr>
<tr>
<td>5. Tertiary circular reactions</td>
<td>12 to 18 months</td>
<td>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.</td>
<td>When Bjorn’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, Bjorn turns the book sideways and hugs it, delighted with his success.</td>
</tr>
<tr>
<td>6. Mental combinations</td>
<td>18 to 24 months</td>
<td>Because 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.</td>
<td>Jenny plays with her shape box, searching carefully for the right hole for each shape before trying—and succeeding.</td>
</tr>
</tbody>
</table>

*Note: Infants show enormous cognitive growth during Piaget’s sensorimotor stage, as they learn about the world through their senses and their motor activities. Note their progress in problem solving and the coordination of sensory information. All ages are approximate.
Key Developments of Sensorimotor Stage

- Imitation
- Object permanence
- Symbolic development
- Categorization
- Causality
- Number
<table>
<thead>
<tr>
<th>Concept or Skill</th>
<th>Plaget's View</th>
<th>More Recent Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imitation</td>
<td>Invisible imitation develops around 9 months; deferred imitation begins after development of mental representations in the sixth substage (18–24 months).</td>
<td>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.</td>
</tr>
<tr>
<td>Object permanence</td>
<td>Develops gradually between the third and sixth substage. Infants in the fourth substage (8–12 months) make the A, not-B error.</td>
<td>Infants as young as 3½ months (second substage) seem to show object knowledge, though interpretation of findings is in dispute.</td>
</tr>
<tr>
<td>Symbolic development</td>
<td>Depends on representational thinking, which develops in the sixth substage (18 to 24 months).</td>
<td>Understanding that pictures stand for something else occurs at about 19 months. Children under 3 tend to have difficulty interpreting scale models.</td>
</tr>
<tr>
<td>Categorization</td>
<td>Depends on representational thinking, which develops during the sixth substage (18–24 months).</td>
<td>Infants as young as 3 months seem to recognize perceptual categories, and 7-month-olds categorize by function.</td>
</tr>
<tr>
<td>Causality</td>
<td>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.</td>
<td>Some evidence suggests early awareness of specific causal events in the physical world, but general understanding of causality may be slower to develop.</td>
</tr>
<tr>
<td>Number</td>
<td>Depends on use of symbols, which begins in the sixth substage (18–24 months).</td>
<td>Infants as young as 5 months may recognize and mentally manipulate small numbers, but interpretation of findings is in dispute.</td>
</tr>
</tbody>
</table>
Do Imitative Abilities Develop Earlier than Piaget Thought?

• Invisible imitation: using a part of body that baby cannot see on themselves
  – Meltzoff found babies less than 72 hours old able to imitate, disappears by about 2 months
    – Piaget thought it developed about 9 months

• Deferred imitation of novel (new) and complex events begins by 6 – 9 months
  – Piaget thought it developed after 18 months

• Elicited imitation of things seen but not done reliable during 2\textsuperscript{nd} year of life, 80\% of toddlers 13 – 20 months able to repeat unfamiliar, multi-step sequence

Studies by Andrew N. Meltzoff
Development of Knowledge about Objects and Space

- When does Object Permanence Develop?
  - Objects/people continue to exist when out of sight
    - Emerges 3rd substage (4 – 8 months)
    - 4th substage (8 – 12 months) look where they first found it (A not B error)
    - 5th substage (12 – 18 months) look where it was last hidden but they cannot look for it in a novel place
    - 6th substage (18 – 24 months) full achievement, will look for object even if they didn’t see it hidden
    - If too much time goes by after object hidden, errors more likely to occur
  - Piaget’s task required 2 steps or 2 hands (move something and then retrieve object)
    - Modified for age, 4 – 8 months can do task following sound
Development of Knowledge about Objects and Space

• Symbolic Development, Pictorial Competence, and Understanding of Scale
  – Manual exploration of pictures up to about 15 months
  – By 19 months child points to picture and names it
    • Able to point to object before this
      – For example, given a duck and shoe, child can point to named object, but not yet able to point to a picture of the duck and shoe until a few months later
  – Television: not aware that what they are seeing represents reality
    • 2-year-olds not able to locate a toy hidden in a room with video training but able to locate the toy when observed through a window
      – Could find the toy when told where it was face-to-face but could not locate the toy when told where it was by video person
Development of Knowledge about Objects and Space (cont)

- Disney offers refund after furor over Baby Einstein DVDs
Evaluating Piaget’s Sensorimotor Stage

- When tasks are simplified and modern tools used, limitations Piaget saw in infants’ early cognitive abilities such as object permanence may have reflected immature linguistic and motor skills.
- Motor experience may not be the primary engine of cognitive growth.
- Infants’ perceptions are far ahead of their motor abilities.
Information-Processing Approach: Perceptions & Representations

- Habituation
- Visual and Auditory Processing Abilities
- Information Processing as a Predictor of Intelligence
- Information Processing and the Development of Piagetian Abilities
Habituation

• Learning where repeated or continuous exposure to a stimulus reduces attention to that stimulus
  – Familiarity breeds loss of interest

• When new sight or sound occurs, captures baby’s attention and baby attends: dishabituation

• How quickly infant habituates indicates intelligence (but not distractibility)
  – Preference for complexity, rapid exploration of environment, sophisticated play, quick problem solving, ability to match pictures
Visual Processing Abilities

- Prefer curved lines to straight lines
- Prefer complex patterns to simple patterns
- Prefer 3-D to 2-D objects
- Prefer moving objects to stationary objects
- Prefer faces of faces or face-like configurations
- Prefer new sights to familiar ones (novelty preference)
Visual Processing Abilities

- Top row is preferred: more objects; stronger contrast, curved lines
- Symmetrical face preferred
Visual Processing Abilities

• Visual recognition memory
  – Two pictures side by side, one familiar and one new
    • Infant will look longer at new, indicating recognition of other picture (habituates quicker with familiar picture)
Visual and Auditory Processing Abilities

- Newborns can tell sounds they have already heard
- Cross modal transfer: use of information gained from one sense to guide another
- Joint attention: contributes to social interaction, language acquisition, and understanding of others’ mental states
  - Develops between 10 and 12 months
  - Follow adults gaze by looking or pointing in same direction
  - Predicts higher language scores 8 months later
Visual and Auditory Processing Abilities

• Watching television may impede attention development
  – The more hours a child watches at ages 1 and 3, more likely they are to have attention problems by 7 years
  – Children who watched at least 3 hours a day scored lower on cognitive measures at age 6
Information Processing as a Predictor of Intelligence

- Habituation and attention-recovery abilities during the first 6 months to 1 year of life are moderately useful in predicting childhood IQ
- Visual recognition memory predictive of childhood IQ
- Modest predictors and don’t take into account environmental influences
Information Processing and the Development of Piagetian Abilities

**Categorization**

- Piaget: ability to categorize doesn’t appear until 6\textsuperscript{th} substage of sensorimotor, around 18 months
  - New brain imaging has found categorization within first 6 months
- Categorize by perceptual features:
  - Shape
  - Pattern
  - Color
- Toward end of 1\textsuperscript{st} year, categories are conceptual, based on real-world knowledge
  - Particularly function
    - Example: 10 – 11-months chairs with zebra-striped upholstery belonged in category of furniture, not animals
Causality

• One event causes another
  – Pop-up toys

• Piaget: develops slowly during first year
Information Processing and the Development of Piagetian Abilities

Object Permanence

- Violation-of-expectations
  - Evidence of object permanence as young as 3.5 months

- Numbers
  - Mickey Mouse dolls, added or taken away
    - Babies looked longer at surprising “wrong” answers than at expected “right” answers
  - Wynn: concepts are inborn (controversial)
    - Parents teach names for concepts babies already know
Object Permanence

Habituation Events
- Short carrot event
- Tall carrot event

Test Events
- Possible event
- Impossible event
Information Processing and the Development of Piagetian Abilities

Evaluating Information-Processing Research on Infants

• Violation-of-expectations studies: controversial as to reasoning abilities
  – Is infant’s visual interest in an “impossible event” a conceptual understanding or a perceptual awareness?

• Drawbridge experiment
  – Baillargeon’s research has been repeated without the same results
Cognitive Neuroscience Approach: The Brain’s Cognitive Structures
Cognitive Neuroscience Approach: The Brain’s Cognitive Structures

- Implicit memory
  - Develops early in infancy
  - Remembering that occurs without effort or even conscious awareness
    - Habits, skills
      - How to ride a bike
      - How to find your way home
      - Your birthday

- Explicit memory (aka declarative memory)
  - Conscious or intentional recollection
  - Usually facts, names, events, other things

- Hippocampus maturing and cortical structures make longer-lasting memories possible

- Prefrontal cortex controls many aspects of cognition

- Working memory: short-term storage of information brain is working on
  - Allows object permanence to develop
Social-Contextual Approach: Learning from interactions with Caregivers
Social-Contextual Approach: Learning from Interactions with Caregivers

• Vygotsky’s guided participation
  – Mutual interactions with adults that help structure children’s activities and bridge the gap between a child’s understanding and an adult’s understanding
  • Occurs during shared play and everyday activities

• Direct adult involvement in children’s play and learning may be better adapted to middle-class urban communities
  – Parents and caregivers have more time
Language Development

- The Evolution of Language
- Sequence of Early Language Development
- Classic Theories of Language Acquisition: The Nature-Nurture Debate
- Influences on Language Development
- Preparing for Literacy: The Benefits of Reading Aloud
<table>
<thead>
<tr>
<th>Age in Months</th>
<th>Development</th>
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<tbody>
<tr>
<td>Birth</td>
<td>Can perceive speech, cry, make some response to sound.</td>
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<tr>
<td>1½ to 3</td>
<td>Coos and laughs.</td>
</tr>
<tr>
<td>3</td>
<td>Plays with speech sounds.</td>
</tr>
<tr>
<td>5 to 6</td>
<td>Recognizes frequently heard sound patterns.</td>
</tr>
<tr>
<td>6 to 7</td>
<td>Recognizes all phonemes of native language.</td>
</tr>
<tr>
<td>6 to 10</td>
<td>Babbles in strings of consonants and vowels.</td>
</tr>
<tr>
<td>9</td>
<td>Uses gestures to communicate and plays gesture games.</td>
</tr>
<tr>
<td>9 to 10</td>
<td>Intentionally imitates sounds.</td>
</tr>
<tr>
<td>9 to 12</td>
<td>Uses a few social gestures.</td>
</tr>
<tr>
<td>10 to 12</td>
<td>No longer can discriminate sounds not in own language.</td>
</tr>
<tr>
<td>10 to 14</td>
<td>Says first word (usually a label for something).</td>
</tr>
<tr>
<td>10 to 18</td>
<td>Says single words.</td>
</tr>
<tr>
<td>12 to 13</td>
<td>Understands symbolic function of naming; passive vocabulary grows.</td>
</tr>
<tr>
<td>13</td>
<td>Uses more elaborate gestures.</td>
</tr>
<tr>
<td>14</td>
<td>Uses symbolic gesturing.</td>
</tr>
<tr>
<td>16 to 24</td>
<td>Learns many new words, expanding expressive vocabulary rapidly, going from about 50 words to as many as 400; uses verbs and adjectives.</td>
</tr>
<tr>
<td>18 to 24</td>
<td>Says first sentence (2 words).</td>
</tr>
<tr>
<td>20</td>
<td>Uses fewer gestures; names more things.</td>
</tr>
<tr>
<td>20 to 22</td>
<td>Has comprehension spurt.</td>
</tr>
<tr>
<td>24</td>
<td>Uses many two-word phrases; no longer babbles; wants to talk.</td>
</tr>
<tr>
<td>30</td>
<td>Learns new words almost every day; speaks in combinations of three or more words; understands very well; makes grammatical mistakes.</td>
</tr>
<tr>
<td>36</td>
<td>Says up to 1,000 words, 80 percent intelligible; makes some mistakes in syntax.</td>
</tr>
</tbody>
</table>

Sequence of Early Language Development

Early Vocalization

- Prelinguistic speech
  - Crying: only means of communication
    - Pitch, pattern, intensity
  - Cooing
    - Vowel sounds between 6 weeks and 3 months
  - Babbling
    - Consonant-vowel strings, “mamamama” “dadadada” between 6 and 10 months
      - Often mistaken for first words
    - Imitation is key to evolution of language
- 9 – 10 months deliberately imitate sounds without understanding
Sequence of Early Language Development

Perceiving Language Sounds and Structure

• Imitation of language sounds requires ability to hear subtle differences, discriminate basic linguistic units, perceive linguistic patterns, and categorize into similar or different
• Infants can discriminate the sounds of any language
• Perception and categorization commits the brain’s neural networks to learning similar patterns
  – Neural commitment constrains future learning of non-native-language patterns
• 6 – 7 months: recognize approximately 40 phonemes of native language and adjust to differences in speakers
  – Ability to discriminate sounds predicts language abilities during 2\textsuperscript{nd} year
• 10 – 12 months: lose sensitivity to sounds not part of their language
  – Japanese babies cannot hear difference between “ra” and “la”
• 6 – 12 months: phonological rules, how sounds are arranged in speech
Sequence of Early Language Development

**Gestures**

- 9 months: point to object to indicate interest
- 9 – 12 months: conventional social gestures
  - Waving bye-bye, nodding head “yes”, shaking head “no”
- 13 months: representation gestures
  - Bringing empty cup to mouth
- Symbolic gestures: blowing to mean “hot” or sniffing to mean “flower” emerge, function like words, emerge same time as words emerge
- Drop off when children have vocabulary of 25 words
- Comes naturally
  - Doesn’t depend on model or being observer
Sequence of Early Language Development

First Words

- First word between 10 – 14 months
  - “Mama” or “dada” or simple syllable that has more than one meaning

- Holophrase
  - “Da” means “I want that,” “I want to go out,” or “Where’s Daddy?”

- Expressive (spoken) vocabulary is slower at first than receptive (heard) language

- Nouns easiest to learn
  - Cross-cultural
Sequence of Early Language Development

First sentences

• 18 – 24 months: Two-word sentences
  – 8 – 12 months after first word
  – Ages vary greatly

• First sentences deal with everyday events, things, people, or activities

• Telegraphic speech: few essential words

• 20 – 30 months: syntax
  – Syntax: rules for language
Sequence of Early Language Development

First sentences
• 18 – 24 months: Two-word sentences
  – 8 – 12 months after first word
  – Ages vary greatly
• First sentences deal with everyday events, things, people, or activities
• Telegraphic speech: few essential words
• 20 – 30 months: syntax
  – Syntax: rules for language
  – Articles (a, the)
  – Prepositions (in, on)
  – Conjunctions (and, but)
  – Plurals
  – Verb endings
  – Past tense
Characteristics of Early Speech

• Children simplify speech
• Children understand grammatical relationships they cannot express
• Children underextend word meanings
  – Only MY blanket is “blanket”
• Children overextend (overgeneralize)
  – Every blue car is Daddy’s car
• Children overregularize rules
  – Forming adjectives from nouns, they apply rules universally before they learn the exceptions to rules
    • Hand/hands; foot/foots
    • Walk/walking/walked; go/going/goed
Classic Theories of Language Acquisition: The Nature-Nurture Debate

• Skinner: language is learned from experiences
  – Operant conditioning
    • Caregivers reinforce sounds that make sense
• Social learning: babies imitate sounds they hear
• Chomsky: (constructivist, nativism) observation, imitation, and reinforcement doesn’t fully explain language acquisition
  – Nativism emphasizes the active role of the learner
  – LAD: language acquisition device
    • Doesn’t explain how the LAD operates
    • Experience-expectant
    • All infants coo, babble
    • Twin studies indicate it is not experience but rather genetics that influence vocabulary
    • Thought, not experience, produces language
• Deaf children make up their own sign language when they don’t have models
  – Hand babbling between 7 – 10 months, when hearing infants begin voice babbling
  – Sentences in sign begin at the same time vocal sentences begin
• Intertwining of nature and nurture
Influences on Language Development

**Brain Development**

- Newborn’s cries controlled by the brain stem and pons
  - Most primitive parts of the brain and earliest to develop
- Babbling emerges with maturation of parts of the motor cortex
  - Controls movements of the face and larynx
- Auditory and motor activity centers mature early in second year when talking begins
- 98% of people have left hemisphere dominant for language
Influences on Language Development

Social Interaction: The Role of Parents & Caregivers

- **Prelinguistic Period**
  - Parents imitate baby sounds, “dance of reciprocity”

- **Vocabulary Development**
  - Strong relationship between frequency of words in mothers’ speech and talkativeness with toddlers’ vocabularies
    - Mothers with higher SES use richer vocabularies, longer utterances and their 2-year-olds have larger spoken vocabularies
      - 8 times larger
Influences on Language Development

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    - Sensitive and responsive caregiving may be more important
  - **Bilingual: code mixing**
    - Doesn’t cause them to confuse the two languages
    - Code switching: shift from one language to another
Influences on Language Development

*Child-Directed Speech*

- High-pitched, exaggerated ups and downs, simplified speech, exaggerated vowels sounds, short words, repetitive words, toileting words
- Some research indicates not helpful, more indicates it is
- Infants prefer CDS
Preparing for Literacy: The Benefits of Reading Aloud

- Literacy: ability to read and write
- Adult reading styles:
  - Describer style
    - Describes and invites child
  - Comprehender style
    - Looks deeper into story, inferences, predictions
  - Performance-oriented style
    - Reads story straight through, asks questions after
- Promising technique: dialogic or shared reading
  - Parents ask challenging open-ended questions rather than yes/no
  - Follow up on child’s answers with more questions
  - Correct wrong answers and give alternative possibilities
  - Relate story to child’s experiences
  - Doesn’t come naturally to most parents
A man is but the product of his thoughts. What he thinks, he becomes.
~Mahatma Gandhi