MIDTERM #2 STUDY NOTES

CHAPTER 6 - Physical Development

Changes in Body Proportions

- Newborns typically appear “all head”
- Development proceeds in a cephalocaudal (head down) direction
- Children also grow proximodistal (centre outward) position (e.g. during prenatal development, chest and internal organs develop first, followed by arms and legs then hands and feet).
- Trunk grows fastest during the first year
- After the first year until adolescence, the legs grow rapidly
- During adolescence, the trunk becomes fastest growing segment once again
- Throughout infancy and childhood, arms and legs grow faster than hands and feet
- Just before puberty, hands and feet begin to grow rapidly and become the first body parts to reach adult proportions.

Skeletal Development

- Prenatal: soft cartilage that gradually hardens into bony material (ossification)
- Birth: most of infant’s bones are soft, pliable, and difficult to break
- Skull is formed by age 2, with pliable points at the seams where skull bones join (sutures)
- Skull and hands mature first, leg bones develop until mid to late teens, skeletal development complete by age 18

Muscular Development

- Neonates are born with all the muscle fibres they will ever have
- Muscle fibres soon begin to grow as the cellular fluid in muscle tissue bolstered by the addition of protein and salts, size and weight of fibres increases
- Muscular development proceeds in cephalocaudal and proximodistal directions
- Occurs gradually over childhood and accelerates during adolescence

Development of the Brain

- Experience brain growth spurts: the period between the seventh prenatal month and 2 years of age when more than half of the child’s eventual brain weight is added
- Actual brain weight tells us very little about how or when various parts of the brain mature
- Brain imaging technologies (MRI, fMRI) measure electrical activity in the specific regions of the brain

Neural Development and Plasticity

- Neurons: basic unit of the brain and nervous system, receive and transmit neural impulses
- Glia: nerve cells that serve multiple important functions:
    - Nourish neurons
    - Encasing them in insulating sheaths of myelin
    - Facilitating transport
    - Waste removal
- Majority of neurons a person will have in a lifetime already formed by second trimester of pregnancy; before brain growth spurt even begins

Cell Differentiation and Synaptogenesis

- Synaptogenesis: formation of connections (synapses) among neurons; proceeds rapidly during the brain growth spurt
- Average infant has far more neurons and neural connections than do adults•Synaptic pruning: refinement and elimination of neurons

- Begins near the time of birth and completed near end of sexual maturation
- Plasticity: capacity for change; a developmental state that has the potential to be shaped by experience
- Development of brain is the result of biological and early experiences

Brain Differentiation and Growth
- Not all parts of the brain develop at the same rate
- Lower subcortical brain centres most developed at birth
- Cerebrum, cerebral cortex, primary motor areas, primary sensory areas develop later

Myelination
- Myelination is the process by which neurons are enclosed in waxy myelin sheaths that will facilitate the transmission of neural impulses
- Proceeds very rapidly over the first few years of life, not all areas of the brain are myelinated until mid to late teens
    - E.g. reticular formation and frontal cortex
- Myelination enhances the efficiency between the more primitive, emotive subcortical areas of the brain and the more regulatory prefrontal cortical areas

Cerebral Lateralization
- Cerebral lateralization involves the specialization of brain functions in the left and the right cerebral hemispheres
- LEFT BRAIN: contains centres for speech, hearing, verbal memory, decision making, language processing
- RIGHT BRAIN: contains centres for visual-spatial processing, non-linguistic sounds, expression of negative emotions.

Trends in Locomotor Development
- Motor development typically proceeds in cephalocaudal and proximodistal directions
- Infant Kicking: infants are able to coordinate hip movement earlier than shoulder movement which contradicts the cephalocaudal rule of thumb
- Some exceptions may apply

Maturational Viewpoint
- Maturation underlies motor development and practice merely allows child to perfect those skills
- Motor development is the unfolding of genetically programmed sequence of events where the nerves and muscles mature downward and outward
- Children gain more control over the lower and peripheral parts of their bodies
- Infants around the world progress through roughly the same sequence of motor milestones

The Experiential (of Practice) Hypothesis
- Practicing motor skills is important
- Lack of practice inhibits motor development
- Cross cultural differences in promoting practice
    - E.g. Dennis' experiment with infants

Dynamical Systems Theory
- Theory that views motor skills as active reorganizations of previously mastered capabilities undertaken to find more effective ways of exploring the environment or satisfying other objectives
- New skills = construction
- Infants actively reorganize existing motor capabilities into new and more complex action systems

Fine Motor Skills

- Prereaches: primitive thrusts
- Palmar grasp: reflexive grasp
- Ulnar grasp: an early manipulator skill in which an infant grasps objects by pressing the fingers against the palm
- Pincer grasp: a grasp in which the thumb is used in opposition to the fingers, enabling an infant to become more dexterous at lifting and fondling objects

Onset of Puberty: Sexual Maturation Female

- Age 9-11: breast buds, public hair
- Age 12.5: menarche (first period)

Onset of Puberty: Sexual Maturation Male

- Age 11-12: enlargement of testes, pubic hair, scrotum descends
- Age 13-14.5: sperm production begins, spermarche (first ejaculation)
- Age 13.5-15: penis fully developed, can father children

Timing of Puberty

- Individual differences exist
- Affects males and females differently psychologically
- Males with early onset: some research indicates increases in depressive symptoms; some research indicates more socially confidence
- Females with early onset: less popular, less outgoing, higher levels of anxiety and depression

Causes and Correlates of Physical Development: Hormones

- Inherit a unique combination of genes that influence our physical growth and development
- Hormones influence development before a child is born
- Thyroxine: a hormone produced by the thyroid gland; essential for normal growth of brain and body
- Pituitary gland: master gland; at the base of the brain and regulates the endocrine glands and produce growth hormone
- Estrogen: female sex hormone, produced by ovaries, responsible for female sexual maturation
- Testosterone: male sex hormone, produced by the testes responsible for male sexual maturation

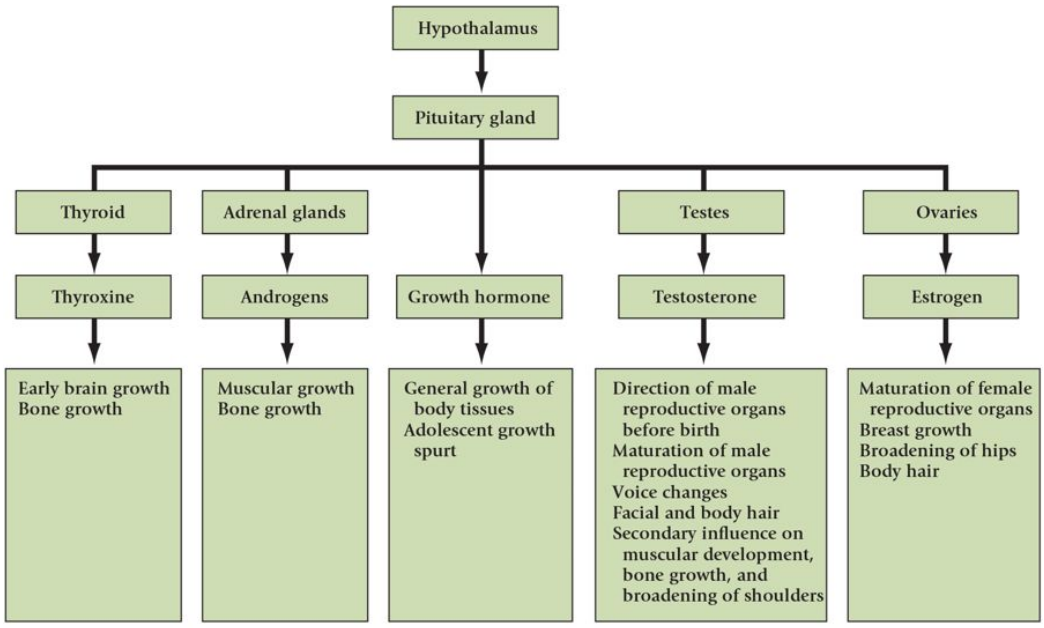

Figure 6.7 Hormonal influences on physical development

Causes and Correlates of Physical Development: Environmental Influences

- Nutrition
- Undernutrition
    - Catch up growth: period of accelerated growth in which children who have experienced growth deficits grow very rapidly to “catch up to” the growth trajectory that they are genetically programmed to follow
    - Marasmus: growth-retarding disease affecting infants who receive insufficient protein and too few calories
    - Kwashiorkor: growth-retarding disease affecting children who receive enough calories but little if any protein
- Over nutrition
    - Obesity: medical term describing individuals who are at least 20 percent above the ideal weight for their height, age, and sex
- Illnesses:
    - Measles
    - Chicken pox
    - Pneumonia
- Quality of care:
    - Nonorganic failure to thrive
    - Deprivation dwarfism

CHAPTER 7 - Early Cognitive Foundations: Sensation Perception and Learning

- Sensation: detection of stimuli by the sensory receptors and transmission of this information to the brain; involves 5 senses; mental processes involved with 5 senses
- Perception: process by which we categorize and interpret sensory input; interpretation of sensations
- Giraffe Toy! Helps baby develop senses

Early Controversies

- Empiricists: infants must learn to interpret sensations; not born with them
  - Willian James
- Nativists: basic perceptual abilities are innate; born with them
  - Rene Descartes, Immanuel Kant

- Enrichment theory (Piaget)
  - Cognitive schemes are needed to make sense of sensory information
- Differentiation theory (Gibson)
  - Sensory information can be interpreted on its own; children learn to detect distinctive features

Research Methods

- Preference Method (Frantz)
  - Two stimuli presented simultaneously
  - Infant's attention to each measured; measuring the amount of time focused on each object
- Habituation Method
  - Stimulus presented repeatedly until infant's response habituates
  - Discrimination ability tested by presenting second stimulus and observing response, after baby habituates to first stimulus
    - Dishabituation
  - E.g. peek a boo, baby knows to see your face; changing it by using mask instead of hands, yields the same response in the child
- High-Amplitude Sucking Method
  - Birth to 4 months old (used on neonates)
  - Pacifier sucking controls stimulus presentation
  - Faster or harder sucking as a result of more intense stimuli or the introduction of a new stimuli
- Evoked Potentials Methods
  - Record of brain electrical activity (used to check deficiencies in the child)
  - Observe changes in activity for different stimuli
  - Changes indicate ability to discriminate
- Brain-Imaging Techniques *used more frequently today*
  - Magnetoencephalography (MEG): identifies when and where brain electrical activity occurs in response to stimuli.
  - Functional Magnetic Resonance Imaging (fMRI): identifies where electrical activity occurs when at rest and also when active
    - Measures amount of O2-rich blood flow to specific brain areas to replace deoxygenated blood amount used by these areas to detect a specific stimulus

Infant Sensory Capabilities

Hearing

- Highly developed at birth (U-shape curve)
- Newborns can discriminate mother's voice, look in direction of mom
- Early phoneme discrimination, understanding syllabus
- Quickly learn to recognize words and voices, at 4 months they know their own name

- More developed than visual ability at birth

Taste and Smell
- Developed at birth
- Newborns have taste preferences (sweet v salty; prefer sweet)
- Can recognize scent of mother
    - Evolutionarily/ethologically - mother's smell means survival

Touch, Temperature, Pain
- Developed at birth
- Therapeutic massage for premature infants
- Sensitive to temperature
- Sensitive to pain
    - E.g. circumcision yield high pitched scream
- Must be handled delicately and nurturing lay

Vision
- Mostly see in black and white; see the world upside down
- LEAST mature sense in newborns at birth
- Visual acuity of 20/600 (extremely blurry)
    - Adult level reached at 12 months of age
- Require sharper visual contrasts
- Prefer mother's face over that of a female stranger

TABLE 7.1 The Newborn's Sensory Capabilities

Sense	Newborn's Capabilities
Vision	Least well-developed sense; accommodation and visual acuity limited; is sensitive to brightness; can discriminate some colours; tracks moving targets.
Hearing	Turns in direction of sounds; less sensitive to soft sounds than an adult would be but can discriminate sounds that differ in such dimensions as loudness, direction, and frequency; particularly responsive to speech; recognizes mother's voice.
Taste	Prefers sweet solutions; can discriminate sweet, salty, sour, and bitter tastes.
Smell	Detects a variety of odours; turns away from unpleasant ones; if breastfed, can identify mother by the odour of her breast and underarm area.
Touch	Responsive to touch, temperature change, and pain.

Visual Perception in Infancy
- Pattern and form
    - Early preference for moderately complex patterns; 0-2 months
    - High contrast images, sharp boundaries between light and dark colours

Stimuli That Babies Prefer

a) Neonates would experience the world as a blur (visual acuity is poor). They would prefer simple, high contrasting visual patterns. 2-month old would prefer complex visual stimuli and faces as they have better acuity and more likely scan internal features of stimulus.
b) Neonates hear better than they see, are specially responsive to human voices, and show preference for their mother's voice days after birth. The difference between a neonate and 2-month old is less dramatic but discrimination does improve by 2 to 3 months of age. They both prefer speech to other sounds.

Later Form Perception: Perceiving Objects as Whole

- An infant is habituated to a rod partially hidden by the block in front of it
- The rod is either stationary

a. Or moving
b. When tested afterward, does the infant treat the whole rod
c. As “old hat”

Visual Perception in Infancy

- Depth Perception
    - Stereopsis by 3 months of age
    - Pictorial (or perspective) cues to depth by 6 to 7
        - Binocular and monocular cues
    - Size constancy present at birth
        - Visual looming, kinetic cues
- Gibson and Walk’s visual cliff
    - Affordances of balance and locomotor experiences

Intermodal Perception

- Ability to use on sensory modality to identify something already familiar in another sensory modality
    - E.g. recognizing a golf ball by touch instead of by sight
- Development of intermodal perception
    - Senses integrated early
        - Auditor-visual incongruities distress infants
    - Intermodal matching of visual and auditory cues for faces/speech, distance, spatial location emerges around 4 months
    - Consistent with differentiation theory
        - Gibson’s differentiation theory

Basic Learning Processes

- Three features of learning

1. Individual thinks, perceives, or reacts to environment in new way
2. Chang is a result of experience
3. Change is relatively permanent

- Habituation
    - Improves over first year
    - Individual differences that predict later competencies
        - Faster language acquisition
        - Higher intelligence and language test scores
- Classical Conditioning; Pavlov’s discovery with dog’s
    - Classical Conditioning of emotions
        - Fears, phobias, and attitudes
        - Counterconditioning (exposure therapy with pairing of UCS that elicits positive feelings)
    - Classical conditioning in newborns
        - Difficult but possible for biologically programmed reflexes
            - Sucking
        - Takes more time
        - An important mechanism of early learning
- Operant Conditioning
    - The outcome of responses predict the probability of the response occurring again
    - An initial voluntary response produce a pleasant or unpleasant consequence

Outcomes of operant conditioning

	Positive	**Negative**
Reinforcer	Add to situation: INCREASED probability of recurrence	Remove something from situation INCREASED probability of recurrence
Punisher	Add to situation: DECREASED probability of recurrence	Remove something from situation DECREASED probability of recurrence

- Even premature babies can learn by operant conditioning
- Older infants learn after (require fewer trials)
- Infants can remember but can they retrieve information?
- Recognition vs. Recall
- Is punishment effective? Long term, no

Observational Learning

- Imitation
    - Learning from watching others' behaviour
    - Newborn imitate facial gestures
        - Reflexive or voluntary?
- Deferred Imitation develops in second year
    - Ability to imitate model at some point in future

CHAPTER 8 - Cognitive Development

- Cognitive Development: changes that occur in mental activities such as attending, perceiving, learning, thinking, and remembering

Piaget's Theory of Cognitive Development

How we gain knowledge

- Cognitive processes
    - Organization: rearranging existing schemes into more complex ones
    - Adaptation: occurs through assimilation and accommodation
        - Assimilation: interpret new experiences with existing schemes
        - Accommodation: modify existing schemes to interpret new experiences

1.Sensorimotor Stage (birth-2 years)

- Milestones in sensorimotor stage
- Infants coordinate their sensory and motor capabilities
- From behavioural schemes
- 6 sub stages:
    1. Reflexive schemes (birth-1 months)
    2. Primary circular reactions (1-4 months)
    3. Secondary circular reactions (4-8 months)
    4. Coordination of secondary circular reactions (8-12 months)
    5. Tertiary circular reactions (12-18 months)
    6. Mental representations (18 months-2 years)
- Milestones in sensorimotor stage
    - Development of imitation
        - Imitation of novel objects emerges between 8 and 12 months
        - Deferred imitation is thought to emerge 18 and 24 months
    - Development of object permanence
        - Things still exist even if hidden from view
        - A-not-B error (8-12 month old)
        - Invisible displacement (12-18 months)
            - 18-24 month olds can mentally represent invisible displacements

- Challenges to this stage
    - Piaget underestimated infants' abilities
    - New-nativism (Baillargeon)
        - Even infants use symbolism
    - Theory theories
        - "Baby scientists"
        - Combines neo-nativism with constructivism
        - Infants innately understand classes of information, but then construct theories

2.Preoperational Stage

- Deficits in reasoning
    - Animism: attributing life and lifelike qualities to inanimate objects
    - Egocentrism, as in three mountains problem: tendency to view the world from your own perspective while failing to recognize others may have different points of view
    - Appearance/reality distinction: ability to keep the true properties or characteristics of an object in mind despite the deceptive appearance that the object has assumed; notably lacking among young children during the preconceptual period

- Conservation: the recognition that the properties of an object or substance do not change when its appearance is altered in some superficial way
- Decentration: in Piaget's theory, the ability of concrete operational children to consider multiple aspects of a stimulus or situation; contrasts with centration
- Reversibility: the ability to reverse, or negate, an action by mentally performing the opposite action (negation)

- Theory of Mind
  - Children's developing concepts of mental activity
  - Our mental states are not always accessible to others
  - Begins to develop in preoperational stage

- Challenges to this stage
  - Piaget underestimated the preoperational child
    - More recent evidence on egocentrism (Flavell)
    - More recent evidence on animism
    - More recent evidence on conservation
      - Training; identity training

3.Concrete-Operational Stage (7-11 years)
- More logical thinking about real objects and experiences
  - Conservation
    - Reversibility
  - Relational logic
      - Mental seriation (eg. Lining up tallest to shortest)
      - Transitive inference (eg. If a is greater than b, b is greater than c, a is greater than c
    - Horizontal decalage (eg. Understanding mass but not volume)

4.The Formal-Operational Stage (11-12+ years)
- Thinking more rationally and systematically about abstract concepts and hypothetical events
  - Hypothetical-deductive reasoning
  - Inductive reasoning

Piaget's Contribution
- founded discipline of cognitive development
- Emphasized children;s active involvement and exploration in development
- Attempted to explain; not just describe development
- Provided overview of changes in thinking
- Inspired much research (educational principles: importance of independent, practical, challenging learning activities

Evolution of Piaget's Theory
- Failed to distinguish competence from performance
- Are the stages actually practical and realistic?
- Vague explanations of cognitive growth (ambiguous concept's)
- Too little attention to social and cultural influences
- Ignored private speech

Case's Neo-Piagetian Theory
- Robbie Case is best-known neo-Piagetian
  - Refined concepts of assimilation and accommodation
  - Accommodation is exploration and automatic action

        - Existing knowledge is consolidated
        - Repeated practice is important for automization
    - Acknowledged
        - Individual differences in processing capacity and biological factors
        - Role of experience and culture

Lev Vygotsky's Sociocultural Theory

- Cognitive development is driven by collaborative dialogues with Moore knowledgeable members of society (e.g.) intersections with parent, teachers etc.)
- May vary from culture to culture
- Evaluate development using four interrelated levels of analysis
    - Ontogenetic development (changes over lifetime)
    - Microgenetic development (changes in weeks)
    - Phylogenetic development (changes over evolutionary time - millions of years)
    - Sociohistorical development (changes over time in culture)
- Tools of intellectual adaptation (eg. Laptops, smart phones)
- Zone of proximal development
    - Difference between what a learner can accomplish alone and with guidance of a more skilled partner
        - Ex. Riding a bike
    - Scaffolding
    - Guided participation

Information- Processing Theories

- Use the analogy of the mind as a computer with information flowing through a limited-capacity system system composed of mental system composed of mental "hardware" and "software"
- Executive function
    - Implicated in attention, inhibitory control, set-shifting

- Hardware: significant differences in information-processing hardware (memory span, span of apprehension); attributed to increases in a knowledge base and working memory capacity
- Software: use of various memory strategies such as mnemonics, rehearsal, semantic organization, and elaboration; frequently experience production deficiencies; use of multiple and variable strategies in solving problems

Development of Metacognition and Executive Control

- Attention
- Event memory (autobiographical memories)
- Reasoning

Cons of Information-Processing Perspective

- ignores sociocultural influences on cognition
- "Fragmented approach"
- Heavy reliance on limited-capacity working-memory being the center of all cognitive activities

CHAPTER 11 - Language Development

- Language: a small number of individually meaningless symbols (sounds, letters, gestures) that can be combined according to agreed-on rules to produce an infinite number of messages
- Communication: the process by which one organism transmits information to and influences another
- Vocables: unique patterns of sound that a prelinguistic infant uses to represent objects, actions, or events
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5 Components of Language

- Phonology
    - Phonemes: basic units of sound; eventually used to create words
    - English uses about 40 phonemes
        - Ex. /p/ and /b/
- Morphology
    - Rules for how sounds form words
        - Past tense adds -ed
        - Plural add -s
- Semantics
    - Meaning expressed in words and sentences
        - Free morphemes: dog
        - Bound morphemes: - s
- Syntax
    - Rules for meaningful word combinations
        - The cat chased the dog
        - The dog was chased by the cat
- Pragmatics
    - Knowledge of how language is used to communicate
        - Speaking to a young child
    - Sociolinguistic knowledge
        - Cultural rules of language use (“social editors”)
            - Please, thank you, etc.
    - Nonverbal signals

Learning (or Empiricist) Perspective

- Operant conditioning (Skinner)
    - Adults shape child’s speech through reinforcement
- Imitation (Bandura)
- Criticism
    - Early errors creative, not imitated (eg. It broked)
    - Bi-directional imitation of mother-child interactions observed
        - Mother’s will repeat what child says
    - Parents reinforce grammatically incorrect sentences (truth value)

Nativist Perspective

- Humans biologically programmed to acquire language
    - Noam Chomsky’s language acquisition device (LAD): universal grammar; only piece of our brain
    - Dan Slobin’s language-making capacity (LMC)

- Support for nativist perspective
    - Linguistic universals
    - Brain specialization
        - Broca’s area: production of speech

        - Wernicke's area: interpretation of speech
    - Sensitive-period hypothesis: the notion that human beings are most proficient at language learning before they reach puberty
        - Age: child aphasics, early versus late second language acquisition, deprivation: Genie, Chelsea: birth to puberty is the best time to learn a language
- Criticisms
    - LAD/LMC concepts vague
        - Descriptive rather than explanatory
            - Eg. How does the LAD/LMC interpret language?
    - Ignores contribution of environment

Interactionist Perspective

- Learning theorists and nativists partially correct
- Explanation for linguistic universals
    - All children share many common experiences
- Not a LAD or LMC
    - Acquisition depends on slow cognitive development of brain
    - Children acquire experiences as they mat
- Support in the environment
    - Joint activities with parents
    - Child-directed speech (motherese): the short, simple, high-pitched (and often repetitive) sentences that adults use when talking with young children
    - Negative evidence
        - Expansion: responding to a child's ungrammatical utterance with a grammatically improved form of that statement; eg. "Doggie eat" " yes, doggie is eating"
        - Recast: responding to a child's ungrammatical utterance with a nonrepetitive statement that is grammatically correct; eg. "Doggie eat" "What is the dog eating?"
            - Understanding reformatting or words
        - Conversation important

The Prelinguistic Period: Before Language

- Early sensitivity to speech
    - Neonates react to human speech
    - Recognize mother's voice at 3 days old
        - Prefer sound pattern of mother's language
        - Babies have higher heart rates when they hear their mother's speak in utero
    - Young infants can discriminate more phonemes than adults
    - Intonation
- Cooing (2 months of age)
    - Vowel like sounds: oohs, aahs
- Canonical babbling (4-6 months)
    - Vowel-consonant combinations: mamama
- Vocable (language-specific speech production)
    - Consistent use of sound in specific situations (eg. When manipulating toys)
    - Understand certain speech sounds have consistent meanings
    - Turn-taking (7-8 months)
    - Gestures (8-10 months)
        - Declarative gestures (eg. Pointing at a toy)
        - Imperative gestures (eg. Holding arms up to be picked up)
    - Is speech understood?
        - Receptive language: that which the individual comprehends when listening to others' speech

- Productive language: that which the individual is capable of expressing (producing) in his or her own speech

The Holophrastic Period: One Word At A Time

- Holophrase: Single-word utterance with meaning of the entire sentence
  - Word learning slow at first
  - First words produced between 10 to 15 months
- Naming explosion
  - Rapid acquisition of new words for objects (10 to 20 new words a week)
  - Occurs between 18 to 24 months
- Referential vs. Expressive style
  - Referential: language mainly used to label object
  - Expressive: language mainly to call attention; more language involving social interactions
- Multimodal motherese: an older companion's use of information that is exaggerated and synchronized across two or more senses to call an infant's attention to the referent of a spoken word.
- Learning the meaning of words
  - Fast-mapping process
  - Linking word and meaning after one or two exposures
  - Improves with age
- Some common errors
  - Overextension - similar to assimilation
    - Specific word used to describe broader set of objects, actions, or events
    - Using "car" for all motor vehicles
  - Underextension
    - General words used to describe specific instance
    - Using "candy" only for peppermints

Strategies for Inferring Word Meanings

- Processing constraints: cognitive biases or tendencies that lead infants and toddlers to favour certain interpretations of the meaning of new words over other interpretations.
  - Object scope constraint: the notion that young children assume that a new word applied to an object refers to the whole object rather than to parts of the object or object attributes (e.g., its colour
  - Mutual exclusivity constraint: the notion that young children assume that each object has only one label and that different words refer to separate and not overlapping categories.
  - Lexical contrast constraint: the notion that young children make inferences about word meanings by contrasting new words with words they already know.
- Syntactical bootstrapping: the notion that young children make inferences about the meaning of words by analyzing the way words are used in sentences and inferring whether they refer to objects (nouns), actions (verbs), or attributes (adjectives).

From Holophrases to Simple Sentences

- Telegraphic speech (18-24 months): early sentences that consist of content words and omit the less meaningful parts of speech, such as articles, prepositions, pronouns, and auxiliary verbs.
  - Like telegram, contains only crucial content
    - More milk
    - Where ball?
    - Pretty dress
  - Why? Processing and production constraints
    - Tendency to emphasize the most important elements (nouns and verbs) for effective communication

Language During the Preschool Period

- Grammatical morphemes: modifiers that signify subtle changes in the meaning of sentences we construct
- Appear during third year
- Now using articles, auxiliary verbs, grammatical markers
- 14 grammatical morphemes learned in order
    - - ing, In, on, Plural (-s)
    - Past irregulars (went)
- Overregularization
    - Overextension of grammatical morphemes to irregular cases
    - Occurs after learning grammatical morphemes
        - I wented there
        - The mices are speaking
        - The dog ruined really fast

Grammatical Development

- Transformational rules mastered (2 to 5 years old)
    - Asking questions
        - Yes/no and what, when, where
    - Negative sentences
        - “No I go” becomes “I won’t go”
    - Complex sentences
        - “The cat that got loose came back
    - Referential communication: abilities to generate clear verbal messages, recognize when others’ messages are unclear, and clarify any unclear messages one transmits or receives.

Language Learning During Middle Childhood

- Syntactical refinement
- Morphological knowledge (eg. hopelessness): knowledge of the meaning of morphemes that make up words.
- Semantic integrations
- Metalinguistic awareness: a knowledge of language and its properties; an understanding that language can be used for purposes other than communication

Bilingualism

- Language development and bilingualism
    - Pre-1960, believed that simultaneously learning two languages might create risk
        - Studies confounded immigrants, SES, and tests administered in English
    - English, French and Indigenous
        - Simultaneous bilinguals - birth or prior to age 2
        - Code-switching - use both languages in the same conversations
        - Early versus late sequential bilinguals
- Before age 3, children have little difficulty becoming proficient in more than one language
- Some advantages to being bilingual
    - Cognitive advantages
    - Better language proficiency
    - Piagetian conservation
    - Nonverbal intelligence
    - Metalinguistic awareness: