

Developmental Psychology

The study of how people change across the lifespan, while being influenced by both biological and environmental forces

1. Nature, Nurture and Development

- Nature and nurture affect us from the beginning
- Womb: between conception and birth
 - Zygote → embryo → fetus
 - Roughly a 259-day long process; variation because the process is subject to environmental control (poor maternal nutrition/alcohol consumption, high stress → increased risk of premature birth and stunted development)

2. Maturation

- **Maturation:** biological growth across the lifespan, regulated by genes
 - Child development from infancy through adolescence: growth, puberty, etc.
 - Brain development: amount of cortical neuronal connections increases as the child grows
 - You are born with all the neurons you will ever have, but it is the *amount of connections* that increases
 - Skill development: also shaped by biology and maturation, develop at highly predictable times
 - 2-3 months: rolling over (back to front), baby develops increased body strength and better neuronal connections for brain-muscle signaling
 - 4-7 months: sitting up (the ability to sit up, not desire)
 - 6-10 months: crawling (has huge physical and social implications)
 - 8-12 months: walking
 - These skills usually develop in this order, and the timing is strongly related to genes
 - Identical twins tend to develop these skills at the same time (independent of environmental influence) → parents do not necessarily need to teach these skills, they just happen

3. Physical Development in Childhood

- Physical maturation influences development
- **Cognition:** processing information (thinking); influenced by maturation
 - First childhood memories: strong tendency that the average age for memory retention is 3.5 years
 - Related to biological development of language abilities; the ability to remember facts and events
 - We develop cognitive skills across our lifetime, *how* we are able to think
 - Previously, it was thought that children simply had less experience and that is why they aren't as smart as adults → children do not have the cognitive capacity to reason and think abstractly

4. Cognitive Development in Childhood: Jean Piaget

- Overview
 - Jean Piaget (1896-1980), a Swiss scientist/psychologist
 - Taught biology at an all-boys school, administered intelligence tests to the students across a wide age range
 - When he graded the tests, he discovered a pattern: younger children scored lower than older children when tested on the same material, and they scored lower in the same way
 - He realized adult cognition requires **3 essential cognitive skills**:
 - Represent objects
 - Thinking logically about objects behave or interact

- Representing abstractions (mathematical principles, moral/legal rules)
 - Piaget realized that nobody is born with these skills, children must *gain* them, through biological maturation, in order, in a very predictable timeframe
- Stages
 - Piaget published a series of papers in the 1920s and 1930s, proposing that **cognitive development occurs in 4 stages**:
 - Sensorimotor (birth-2 years)
 - ❖ None of these abilities are present
 - ❖ A child's interactions with the world involve figuring out how their actions/sensations work with each other
 - ❖ Cognition focused on connecting sensations with actions
 - ❖ Certain developmental events lay the groundwork for later stages:
 - **Object permanence** develops; things exist even when not visible
 - Focus is on here and now: very limited ability to imagine something that is not physically present
 - Preoperational (2-6 or 7)
 - ❖ Sesame Street creators: designed characters based on these developmental stages, Elmo and Ernie are in the preoperational stages. Thus, children identify with them
 - ❖ Representation of concrete objects/facts
 - ❖ Inability to use logic: children have unrestricted imaginations
 - They are unable to foresee consequences of their actions
 - ❖ No understanding of **conservation** of properties across situations; breaking a cookie in half means 2 cookies to a child, for instance
 - Another example: rearranging 4 objects, the child will no longer know how many are present
 - ❖ View of the world is **egocentric**: children assume that everyone sees the world the way they do
 - Concrete operational (6-7 to 11-12)
 - ❖ Learn to think logically about concrete objects
 - ❖ They can conserve properties across situations (cookie example won't work here; they know the half is smaller than the whole)
 - ❖ But no abstract concepts
 - Formal operational (11-12 onward)
 - ❖ Ability to think about abstract concepts; symbols
 - ❖ Includes thinking logically about those concepts
 - ❖ Pinnacle of cognitive development according to Piaget, but he did not have a specific theory as to how this sequence happened (biological, evolutionary, etc.)
- Schemas
 - Internal (cognitive) representation of the world
 - Much of cognitive development is about forming and updating our schemas to better reflect how the world works
 - A general term for any type of concept/internal representation for things out there in the world
 - Example: picture of a dining room → you may have never seen that specific picture before, but you have an internal representation of what a general dining room looks like, and thus you know what the picture depicts.
 - **Two processes we engage in regarding schemas**:
 - **Assimilation**: understanding a new experience by fitting it into existing schemas.
 - ❖ It is part of cognitive development because you apply old schemas to new information, and it is filed away until we need it.
 - ❖ However, this is not always the correct strategy to label new information; if a child sees an animal underwater, they assume it is a fish. However, say it is a

penguin, which is a bird. The child assumes birds fly and have feathers, so they must process this new information differently

- **Accommodation:** adjusting existing schemas to better reflect experience (underwater animal example). You change your mental representation to better represent events and experiences
 - Piaget states that all of cognitive development is a balance of assimilation and accommodation
 - Intelligence is defined by using the two skills appropriately.
- Contemporary View
- PARALLELS TO PIAGET:
- Piaget has mostly been right about how cognitive development works; many other older psychology theorists have not been right in the modern view
 - Schemas are an organizing principle in cognitive psychology
 - Existence of stages and order of stages is accurate; holds up across cultures and across time
 - This adds evidence to the idea that this may be a biological phenomenon
 - In addition, the stages stay true in reverse; when older adults develop a neurological disorder such as Dementia, they lose these cognitive abilities in the opposite direction that children gain them. So, they first lose the ability to think abstractly, secondly they lose the ability to represent objects
 - Brain/neuroimaging research supports his theory
 - As children go from preoperational to operational, they gain ability to think logically. Certain parts involved in logic grow rapidly between ages 3-6

DIVERGENT FROM PIAGET:

- But stages are more continuous than Piaget thought, not so discrete
 - children show flashes of advanced ability early on before the next stage occurs, and gradually learn the full ability
 - In addition, if a child is tired, hungry, or mentally drained, they will backtrack
- Formal logic (thinking logically about abstractions) is not central to all mature thinking
 - Much of human thought is based on totally irrational cognitive shortcuts that do not obey abstractions/formal logic
 - The ability to use formal logic continues to develop long after the age of 12.

1. Adolescence

Broadly defined as the period between puberty and adulthood

- Physical Development
 - Rapid growth
 - Physical readiness for reproduction: hallmark of adolescence is puberty
 - Reproductive readiness: sperm production for males, ovulation/menstruation for females
 - Secondary sex characteristics: more visible than reproductive signs
 - ❖ These are physical characteristics of males and females that develop during puberty, allowing them to attract mates and reproduce
 - ❖ Females: development of breasts, widening of hips
 - ❖ Males: development of facial hair, more muscle growth
 - Increasing amounts of sex hormones in the brain
- Cognitive Development
 - Adolescence is only the beginning of formal operations
 - Speed of brain processing facilitated by neurons that are **myelinated** (myelin is a fatty substance that wraps around neurons)
 - Myelinated neurons are able to process information faster than non-myelinated
 - Development of myelin in the frontal lobes continues