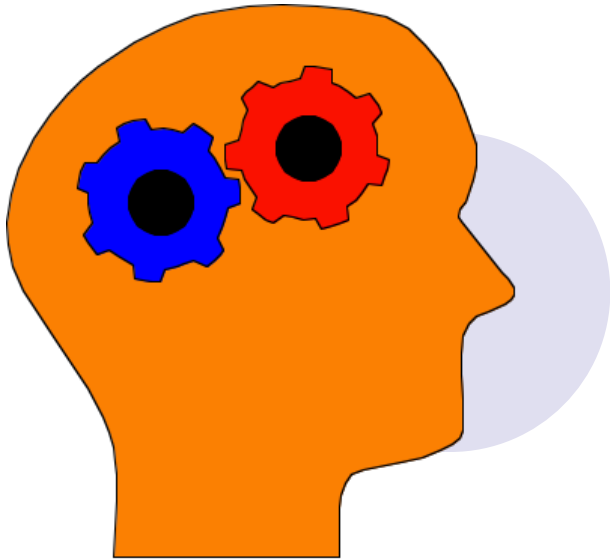


# How Does the Brain Develop Through Childhood?



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# What We'll Try to Cover



- What is the basic nature of a child as their brain develops?
- Does a child grow by incrementally adding more skills or does she/he make substantial fundamental shifts in capabilities at certain times?
- Does a child's brain just need to grow internally (in size and in ability) or does environment affect this growth?



# We'll talk about two theories

- Gesell Maturational Theory
- Piagetian “How Do Children Think” Theory
- These theories help us have a better understanding of children and how they develop

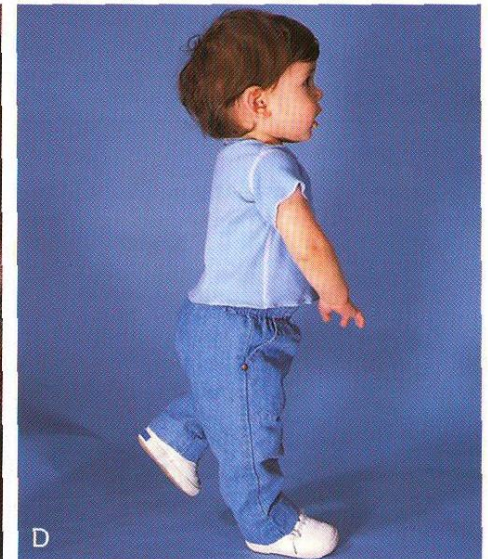
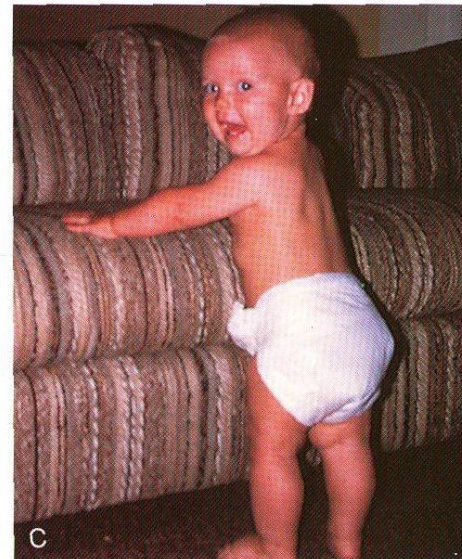
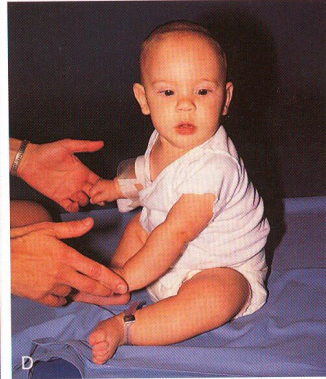
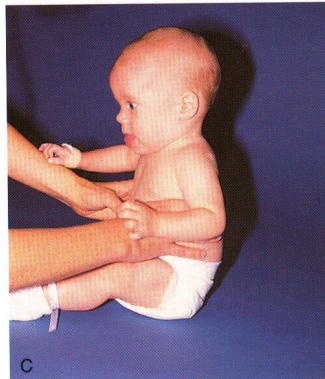
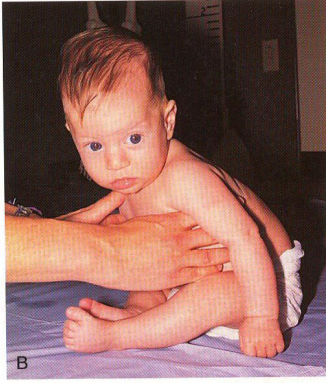
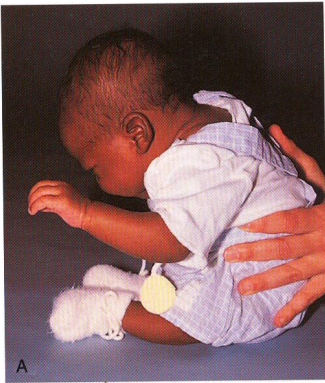
# Gesell Maturation Theory



- If you learned about children reaching certain milestones, this may be your kind of theory!
- According to this theory, development is dependent totally on neurological and physical maturation
- The child is an immature or incomplete organism that moves in predictable patterns of behavior with continuous maturation



# Gesell Maturation Theory



Cephalocaudal  
Progression  
“Head to Legs”

# Gesell Maturation Theory

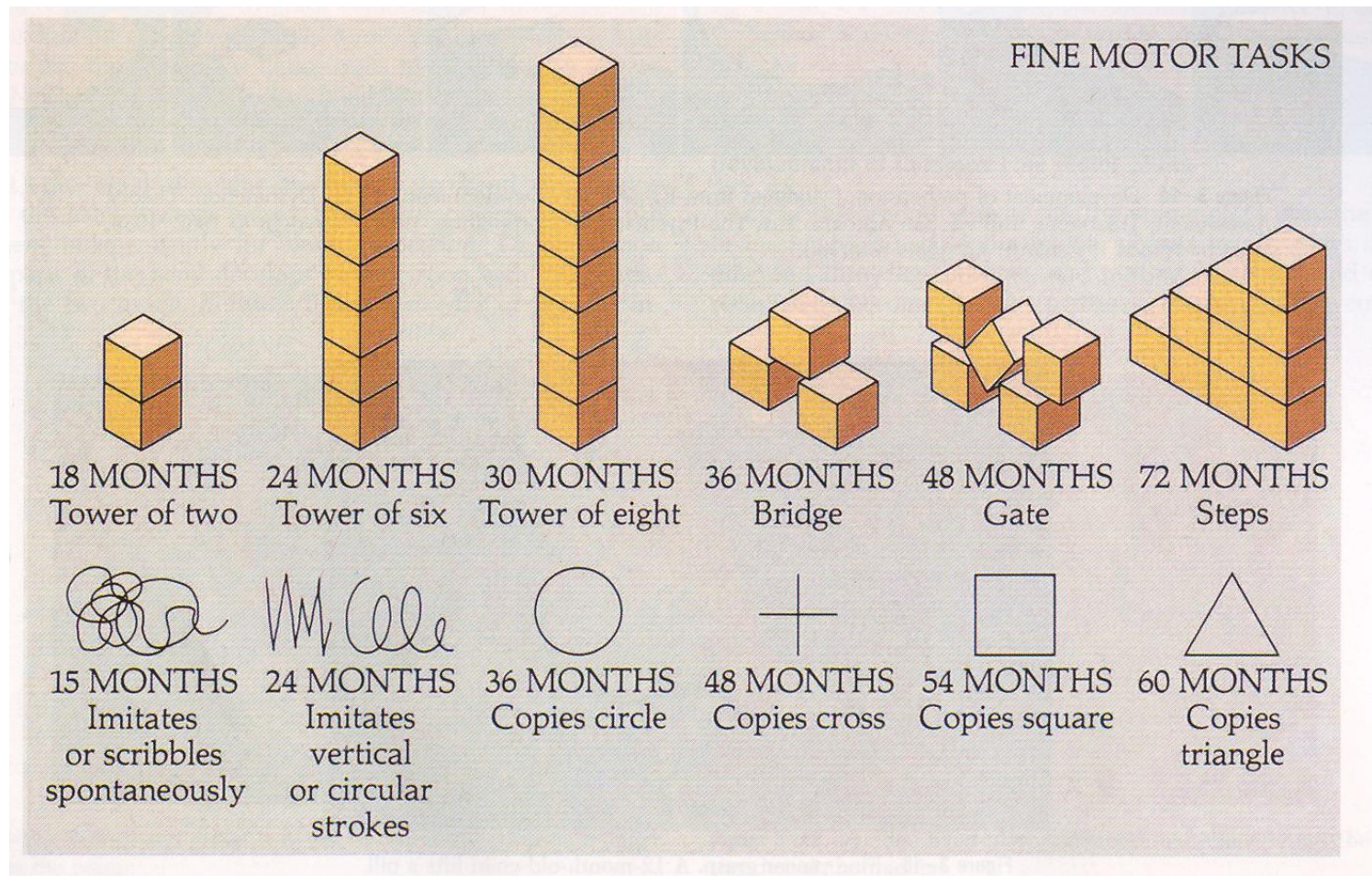


- Children should reach certain milestones in language, motor movement, etc etc and if they don't - abnormal or deviant
- Gesell based his theory on observations of thousands of children.
- Interaction with particular objects showed these progressions



# Still Used in Assessments

## - Blocks and Drawing tasks



# Gesell Maturation Theory



- In this theory, environment has impact (often detrimental - getting in the way of development - such as with an injury) but “intrinsic” development is more important
- Very little actually depends on parents according to this theory - parents should step back, marvel and follow the child’s lead



# Gesell Maturation Theory



- Dr. O's comments:

- We know that learning and teaching affect brain development and behavior
- New abilities can develop that do not seem to build upon previous steps - most true with cognitive development

# Piaget - Cognitive Development

- Children think differently than adults
- Piaget like Gesell also did detailed observations of children - but what children did “wrong” was just as important to him as what they did right
- “Mistakes” that children make show us what children believe and how they see the world

# Piaget - Cognitive Development

- The world is understood by a child but with increasingly complicated mental structures
- Children learn through active interaction with the environment
  - Not just a passive recipient or target of environmental forces
- Much work in Developmental Psychology based on Piaget's work

# Piaget - Cognitive Development

- Children develop by a process of
  - **Assimilation** - taking in information through all of the senses
  - **Accommodation** - taking one's current abilities and understandings and modifying them to adjust to any NEW circumstance or challenge
  - The brain organizes into a new mental structure or physical action (a **schema**)

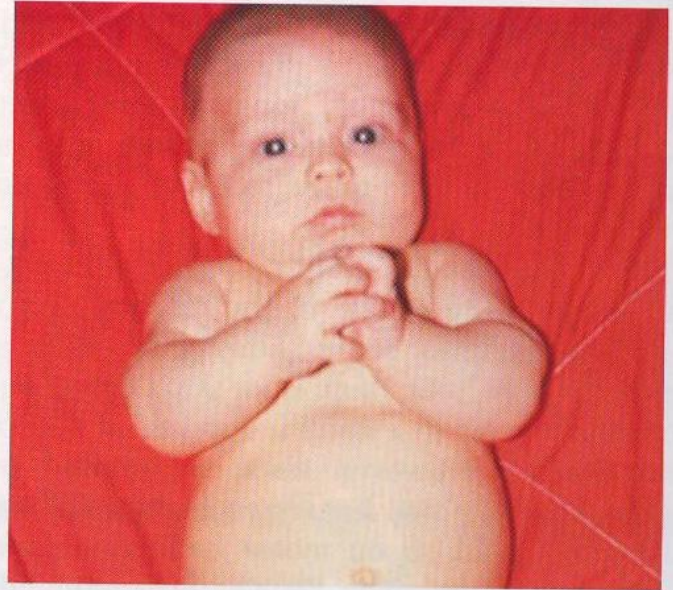


# Piaget - Cognitive Development

- Children do accommodate and show more interest in novel events
- But the child needs to have some structure to assimilate the novel event
- So teaching logic to a 3 year old or abstract math to a 7 year old doesn't work even though these are novel to these children

# Piaget - Cognitive Development - Stages

- There are stages to the mental structures a child has to be able to assimilate new experiences
- Infants -
  - Sensorimotor
    - Circular reactions
    - Object permanence



**Figure 3-12.** Midline hand play. A 2-month-old infant brings the hands together at the midline.

# Piaget - Cognitive Development - Stages

- Preschoolers - Preoperational
  - Egocentric - the world revolves around you
  - Objects are viewed as having a life
  - They assume a link when two things are experienced in close proximity
    - “the nurse blows up my mom’s arm because she is having a baby, that’s why her belly keeps getting bigger”
  - Although their logic is faulty, they are actively seeking associations and linkages
  - So - the world is a “magical” place

# Piaget - Cognitive Development - Stages

- School-Aged - Concrete Operations

- At this age they start to know that changing a shape of an object or the distribution of an array of objects does not change their essence such as mass or number (**conservation**).





# Piaget - Cognitive Development - Stages

- School-Aged - Concrete Operations
  - They can “de-center” enough to know that others may have ideas, feelings and desires different from himself/herself

# Piaget - Cognitive Development - Stages

- Adolescent/Adult - Formal Operations
  - Abstract, theoretical, inductive thinking becomes possible

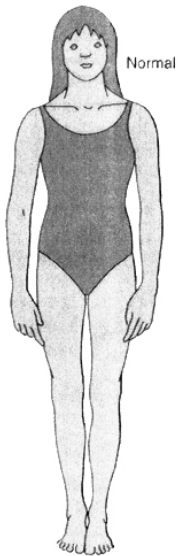
# Piaget



- Dr. O's comments:
- Piaget may have underestimated the capabilities of infants and toddlers
- Boundaries between the stages may be blurred because of teaching and experience and are different in different domains (decollages)
- But Piaget's work probably has spurred more present research than any other theory

# Practical Use of Brain Development Theories

- Child Understanding of Health and Illness
- This has major repercussions:
  - How do we explain an illness to a child of a certain age? Say - Cancer?
  - What should we teach children about health and illness at different ages
  - When do we teach them about sex? What do we teach them about sex?







Let's see what stage (or age group) you think this child is in-

- “Last year I had mono along with three of my friends. I know it's caused by a virus that makes you sleepy and not want to eat and zaps energy. But my friends got better quickly. It seems the mono was harder on my body and my mom thinks it's because we've had a lot of stress in the family”
- Adolescent/Adult - Formal Operations



Let's see what stage (or age group) you think this child is in-

- “I get these headaches sometimes because I fight with my sister and won't let her play with my things”
- School aged - Concrete Operations



Let's see what stage (or age group) you think this child is in-

- “I got a boo-boo on my head because I didn't eat my soup” (He hit his head shortly after lunchtime when his mother unsuccessfully encouraged him to eat tomato soup).
- Preschool - Preoperational
- So how would you talk to this age child about a cancer discovered by his specialist?

# Summary



- Brain development leads to what the child is able to do - to think cognitively, to interact with the world and to adapt to new situations
- Where the child is in her/his brain development determines whether he/she is ready to assimilate and accommodate