

Piaget's theory of infant cognitive development

Precursors for language development

Piaget

- Swiss, 1896 - 1980
- First published scientific paper at age 11 (on albino sparrows)
- Doctorate in biology at age 22



<http://www.time.com/time/time100/scientist/profile/piaget.html>



www.piaget.org

General idea

- Children's thinking is qualitatively different from that of adults.
- Children actively build knowledge
 - “little scientists who are constantly creating and testing their own theories of the world”
 - “not empty vessels to be filled with knowledge”
 - <http://www.time.com/time/time100/scientist/profile/piaget.html>

Four stages

- Sensorimotor period - birth to 2 years
- Preoperational period - 2 to 7 years
- Concrete operational period - 7 to 11 years
- Formal operational period - 11 to 15 years

Sensorimotor Period

- At first, intelligence is limited to the infant's actions on the environment.
- Cognition progresses from the exercise of reflexes to the beginnings of symbolic functioning.

Major issues for period

- Object Permanence
- Causality
- Means-ends
- Imitation
- Play
- Communication

Object Permanence

- Knowledge that objects exist, independent of our perception of them
- Piaget suggests that until 18 months of age appearances and disappearance of an object are not taken as the same object.
- Out of sight, out of mind

A not B error

- Searching for a hidden object in an old location even when sees it hidden in a new location

<http://condor.depaul.edu/~lcamras/images/AnotBerr.mpeg>

Substage 1: 0-1 month

- Infants are born with a wide array of reflexes.
- Learn to modify and adapt those reflexes
- Transition from pure reflexes to more voluntary behavior

Substage 2 - 1 to 4 months

- Some sensory awareness of objects
- Pre-imitation
- Simple motor habits centered around the infant's own body.
 - Action and perception joined

Substage 3 - 4 to 8 months

- Beginnings of object permanence
- Will intentionally repeat actions
- Will imitate actions she's done before, if she can see herself doing it
- Shows interest in objects.

Substage 4 - 8 to 12 months

- Further development of object permanence
 - Will search for hidden objects where they usually disappear
- Externalizes causality
- Imitates things similar to those done before
- Coordination of actions into new and more complex sequences.
- Intentional, goal-directed behavior begins.

Substage 5 - 12 to 18 months

- Can handle sequential displacements
- Active exploring means ends - experiments with objects/actions.
- Actively imitates new behaviors.
- They are now able to alter prior schema to suit a particular situation.

Substage 6 - 18 to 24 months

- Fully developed object permanence.
- Solves problems
- Creative planning
- Deferred imitation



Hulit & Howard (2002) *Born to Talk* Executing an imperfect and perhaps dangerous plan of action.

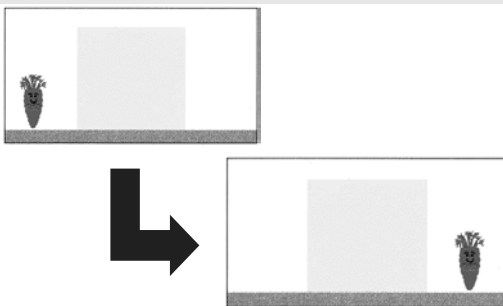
Sensorimotor highlights

Substage (and Months)	Object Permanence	Causality	Means-Ends	Imitation	Play	Communication
1 (0 to 1)	Out of sight, out of mind	No concept of causality	No understanding of means-ends	None	None	No communicative intent
2 (1 to 4)	Uses senses to make and maintain contact with objects	No concept of causality	No understanding of means-ends	Pre-imitation. Repeats her own behavior that has been imitated by someone else	Produces behaviors preliminary to play, including grasping and looking at objects	Cries, coos, and laughs
3 (4 to 8)	Watches object move and anticipates its future position, reaches for partially hidden object	Does not understand cause-effect, behaves as though she is the cause of all actions	Produces goal-oriented behaviors but only after activity has begun	Imitates only behaviors she has spontaneously produced at an earlier time	Still very sensory but begins to interact with other people	Babbles
4 (8 to 12)	Looks for an object if he sees it being hidden	Externalizes causality, knows other people and objects can cause activities	Evidence of planning and the production of intentional behaviors	Imitates behaviors he has not spontaneously produced	Uses developing concepts in his play activities	Links gestures and vocalizations to convey fairly specific messages
5 (12 to 18)	Follows sequential displacements to find hidden object	Sees other people and objects as agents for causality in new situations	Uses experimentation to solve problems	Uninhibited imitation to facilitate her own understanding	Play reflects cognitive growth. He figures out how to make toys work	Produces first meaningful words. Communication is intentional but still heavily nonverbal.
6 (18 to 24)	Fully developed concept of object permanence, can now accommodate invisible displacements	Causality enhanced by ability to represent objects and cause-effect relationships in his mind	Can mentally represent a goal and his plan for achieving the goal	Deferred imitation, imitates a behavior he has represented mentally and stored in his memory	Progresses from autoperceptive to symbolic play	Imitates and spontaneously produces multiple word utterances

Recent findings

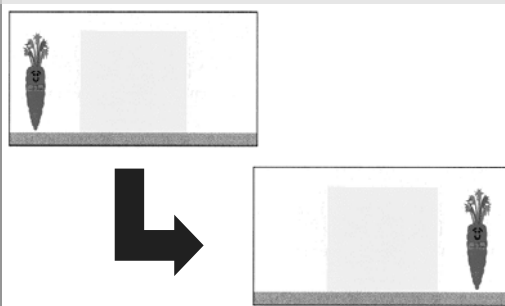
- Recent research push concepts like object permanence and deferred imitation to much younger ages than Piaget suggested.

Short carrot event

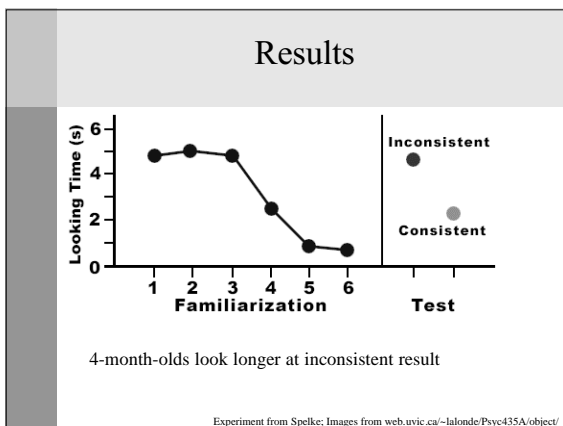
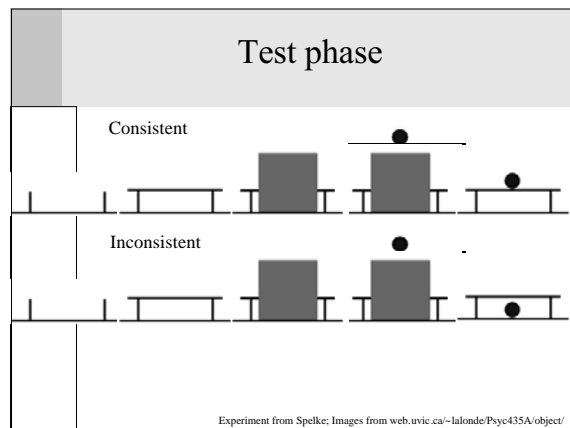
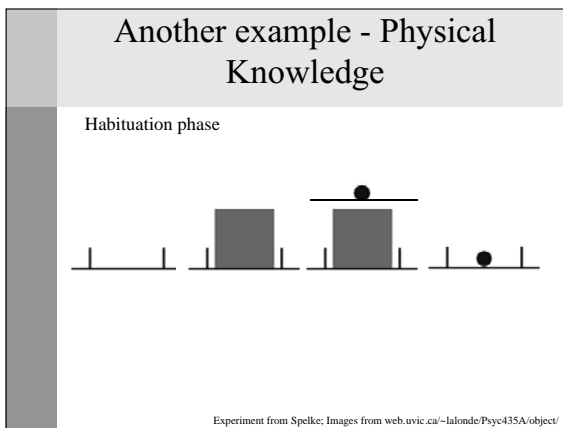
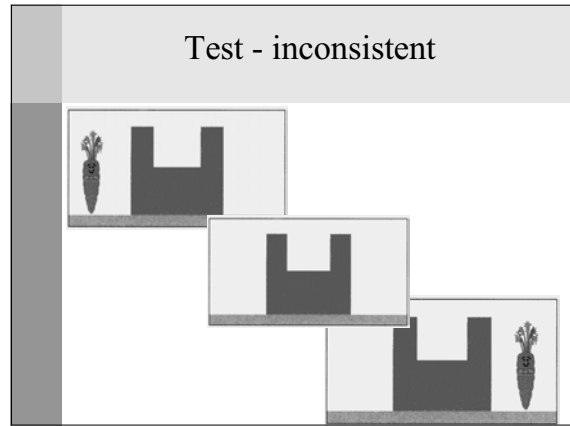
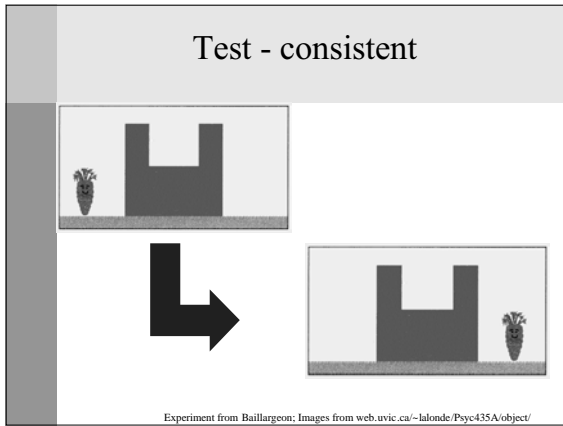


Experiment from Baillargeon; Images from web.uvic.ca/~lalonde/Psyc435A/object/

Tall carrot event

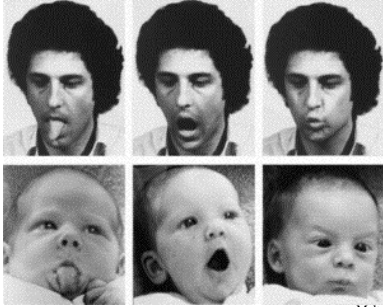


Experiment from Baillargeon; Images from web.uvic.ca/~lalonde/Psyc435A/object/



- ### Infant knowledge
- These types of tasks have been used to show that infants (from 2.5 - 6 months) recognize:
 - That objects continue to exist when masked by other objects
 - Objects cannot move through space occupied by other objects
 - Objects cannot remain stable without support
 - Objects move along spatially continuous paths
-

Imitation



Melzoff & Moore, 1977

How these developments may relate to language

- Object permanence - related to naming performance
- Causality - requirement for communication, and related to verb comprehension
- Deferred imitation - related to naming performance