

Infant Cognition & Memory



Knowledge about Objects



Knowledge about Objects

- Paradigms
 - Search behavior
 - Habituation
 - Emotional reactions

Piaget's Theory

- Constructivist
 - Schema - blueprint for action
 - Reflexes are basic schemas that can develop
 - Processes of Adaptation
 - Assimilation: Incorporate into existing schemas
 - Accommodation: Modification of existing schema.
 - Balance between these is called equilibration
- Development occurs in stages
 - Discontinuous
 - Sensory Motor is the infant stage

Sensori-motor Stage

- Interaction with and knowledge of the world based on perception and action
- Infants initially lack ability to form mental representations - develops over 24 mo.
- Divides stage into 6 substages (p. 163)

Major Development

- Growth of Representation



“Out of sight out of mind”

Search Behavior (Piaget)

- Object permanence task
 - Basic SearchTask
 1. Show toy
 2. Cover with cloth
 3. Can baby find it?
 - A not B Search task
 1. As above
 2. Subsequent trial hide toy in new location
 3. Can baby find it?





"Where is it?"

Development of Object Permanence (p. 191)

- 8 mos.
 - Search for hidden objects
 - Still make A-not-B error
- 12-18 mos.
 - Search for objects observed moved (Visible Displacements)
- 18-24 mos.
 - Search for objects even if not seen moved (Hidden Displacements)

Nativist Accounts

- Knowledge of objects present MUCH earlier
- Habituation paradigm

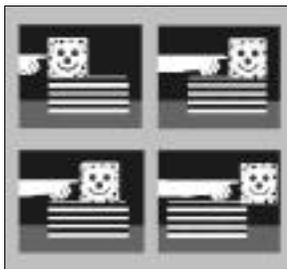
Habituation

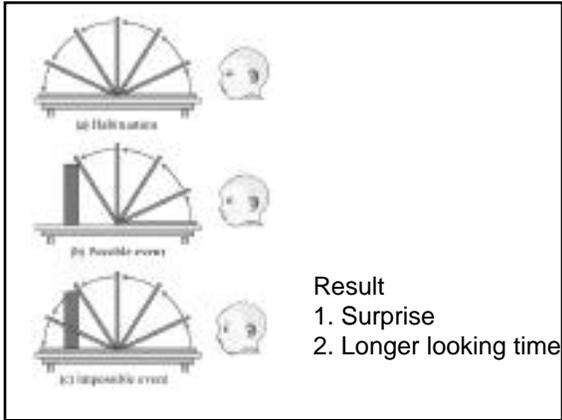
- Repeatedly present stimulus
- Until looking time decreases
- Present new display
- Assess looking time (AND reaction)

Habituation

- By 3.5 months, infants recognize impossible events

Baillargeon





Is it really because the event is impossible or is it novelty?

Cashon & Cohen

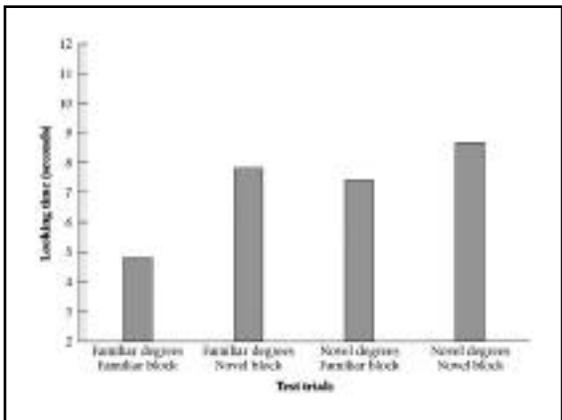
Co-vary novelty and possibility

Procedure

1. Habituate to 180 through block (impossible)
2. Test on 180 through block (impossible) and 180 with no block (possible)

Result

Look longer at the possible (but novel) event



Further Evidence ...

- That Piaget was uh wrong....
 - Plexiglass covers (Butterworth, Yates)
 - Length of delay (Diamond)
 - Looking-action mismatch (A not B error) (Diamond)
 - Inhibition of motor response
 - Example: E hides toy in well on right, baby finds it. Then



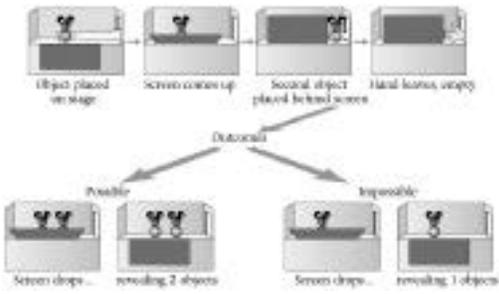
Conclusion

- What Develops?
 - Memory?
 - Inhibition?
 - Graded knowledge?

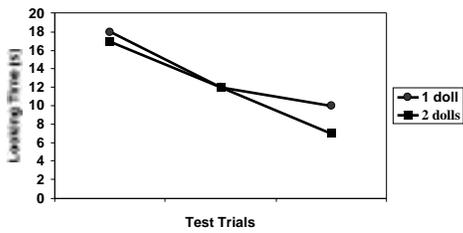
Knowledge of Number



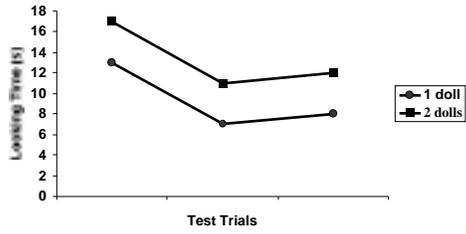
Wynn (habituation)



"1 + 1"



“2-1”



Infant Memory

- Physiological responses
- Imitation
- Operant conditioning

Operant Conditioning

1. Baseline of an action
2. Introduce reinforcement
3. Record infant action



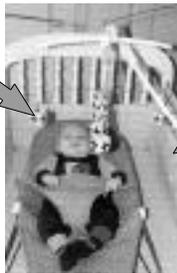
Infant Memory

Standard Procedure (Rovee-Collier)

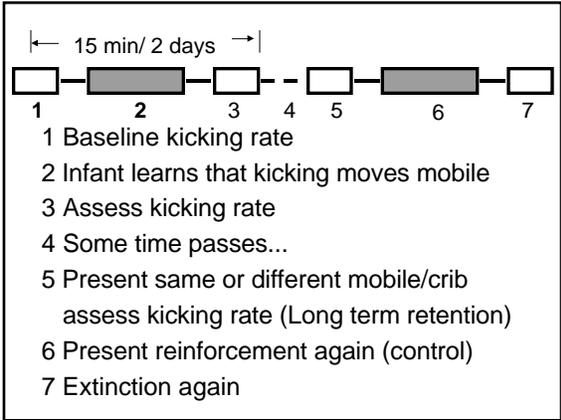
- Subjects
 - 2, 3, or 6-mos. old infants
- Procedure
 - Baseline kicking measure
 - Trained to kick to make a mobile move
 - Time delay
 - Re-introduce mobile/crib (not attached)
 - Measure kicking behavior

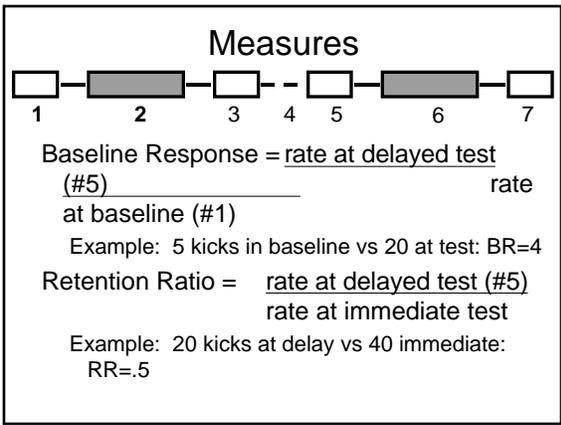
Infants are to remember either

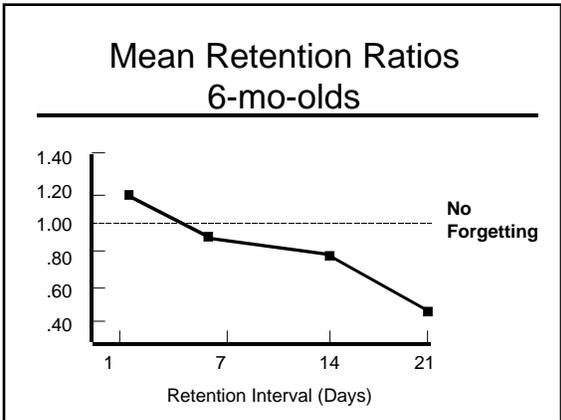
what is on
mobile...
(Object)



or...what
is on sides
(Context)







How long can babies remember?

2 mos.	2-3 days
3 mos.	6 -8 days
6 mos.	15 - 16 days

However...retention highly sensitive to parameters of training

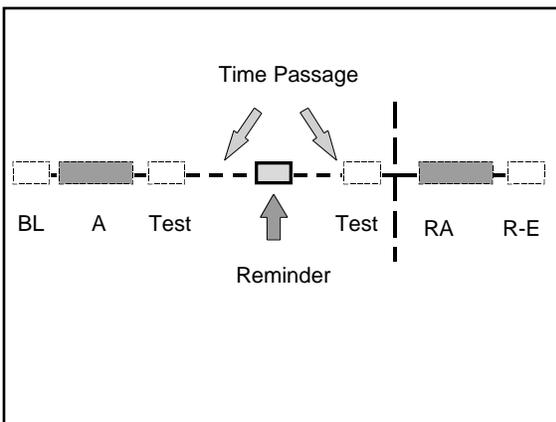
- Distribution of "training minutes"
-2- 9 min vs 3- 6 min sessions
- Adding a session or prolonging a single session

How exact is their memory?

- Change 1 item in 5-item mobile,
-2 - 3 mos. old will NOT remember at 1 day
- "Encoding specificity hypothesis"

Reactivation Procedure

- Expose infant to reminder
 - Feature of mobile
 - Feature of context (crib)



Time Windows

Do reminders help?

Yes, but...

- 2 months
 - Reactivation at 3 weeks, but not 4
- 3 months
 - Reactivation at 4 weeks, but not 5
- 6 months
 - Almost 3 months

Limited period of time

- New memory consolidate with old
 - Strengthens memory trace
- If beyond window - 2 separate events
 - Does not affect memory strength

Further...

- Developmental differences in TIME it takes to retrieve a memory
 - 3 months
 - 8 hrs. after reminder before reactivated memories emerge; complete recovery takes 3 days
 - 6 months,
 - 1 hr. before emerge, 4 hrs. complete
