Piaget

• Child as scientist, knowledge is constructed by the child.
• Constructs:
  • assimilation, accommodation, equilibration,
  • concepts (e.g. object permanence, conservation, etc)

• Nature vs. Nurture?
• Continuous vs. Discontinuous?
• Child as active or passive?
• What drives behavior?
• What drives change?

Piaget on A-not-B

• Babies fail at this task because they do not have the concept of object permanence.
• For 8-10-month-olds, an object is acting and sensing. Its location, the search itself, is part of the object.
• Babies older than 12 months, succeed at the task because they are able to form and abstract mental representation of the object.
Information Processing Theories

• Children as computational devices.
• Knowledge accrues over time, Emphasis on processes.
• Constructs:
  • Memory, Attention, Strategies, Goals
  • Representations, operations.

• Nature or Nurture?
• Continuous vs. Discontinuous?
• Child as active or passive?
• What drives behavior?
• What drives change?

Traditional Information Processing on A-not-B

(Diamond, Marcovitch & Zelazo)

• Babies fail at this task because they have limitations of basic cognitive processes: memory, attention, planning.
• 8-10-month-olds, have trouble remembering a new location, or inhibiting another search has been successful before.
• Babies older than 12 months, succeed at the task because they have more computational resources.
Connectionist Networks

- Information is processed in parallel by simple units that work under simple rules.
- General principles -- associative learning, generalization by similarity, patterns of connectivity -- drive change.

Connectionist Networks on A-not-B

(Munakata, Johnson)

- The A-not-B error arises from a competition between ‘latent’ memory traces for A and ‘active’ traces for B.
- 8-10-month olds fail at the A-not-B task because the “latent” memories of A win over the “active” memory of B.
- Babies older than 12 months, succeed at the task because they are better at actively maintaining memory traces.
Connectionist Model of Information Processing

Dynamic Systems

- Child as a system
- Emphasis on low-level processes - memory, attention, motor activity -- acting in time.
- Constructs: trajectories, attractors
- No representations.
Dynamic Systems on A-not-B
(Thelen, Smith, Spencer)

• The A-not-B error comes from the fact that attending and reaching at time $T$ influence attending and reaching at time $T+1$.
• It is not about conceptual understanding -- people can make an A-not-B error at any age.