Development

• Change across the lifespan
  – Whole capabilities appear as kids grow up
  – And degrade in older adults
• Starts in utero
  – A very important environment
  – As demonstrated by effects of teratogens
    • Environmental factors that can disrupt healthy neural development in utero
    • Examples include lead, alcohol, cigarette smoke

Some capabilities that develop

• Understanding of physical support
• Theory of mind
• Understanding conservation of quantity
• Inhibitory control
• Reasoning ability, fluid intelligence
• Language
  – There is probably a critical period ending age 12-15 years

Measuring infant mental processes

• Problem: Infants can’t speak or understand instructions
• One solution: Habituation procedures
  – Show a stimulus until infant is habituated (bored)
  – Then manipulate the stimulus in a specific way
  – Then ask whether infant is dishabituated (surprised)
    • Measure with gaze duration
    • Surprise = longer looking times
    – Surprise reveals expectations

Physical support

• Is the child surprised?
  • Yes (3 month old):
    – Expects box to fall
  • No (slightly older):
    – Expectations not violated
    – May think the finger supports the box
      • How to manipulate the stimulus to test this?
      • Pull away the finger
Method issue

• How much should this person know about what’s going on?
  – As little as possible

Inhibitory control

• “In the shape game, if I show you a boat, like this, it goes in the left box. If I show you a rabbit, it goes in the right box.”
• “In the color game, if I show you a blue one, it goes in the left box. If I show you a red one, it goes in the right box.”

Inhibitory control

• Children know the new rule
  – Can demonstrate where the items should go
• But can’t act on it
  – Usually viewed as inability to inhibit the old rule
• Inhibitory control isn’t completely developed until our early 20s

Theory of mind

• Understanding that other people have minds of their own
  – And that their thoughts can differ from our own
  – Prerequisite for deception
• Before age 5 or so, kids think that everyone else thinks what they think

False belief test

Girl is asked, “Where does Teddy think the ball is?”
  – The girls thinks Teddy thinks what she thinks

Conservation of quantity

• Understanding that quantity is conserved under certain transformations
  – Develops around age 5-6
Raven's progressive matrices
A test of reasoning ability (fluid intelligence)

Effects of cognitive aging