How infants learn social skills

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but first...

Why study development?
Reasons to study development

- disabilities, treatment, education
- to understand adult traits, must know how they emerged
  - complex skills emerge as history ← biology product
- hardest problem in social or biological sciences...
  - “explaining [quantum physics] is child’s play compared to [explaining] child’s play”
Another reason:

- rhetoric & folk-beliefs about human development in political/religious/economic discourse:
  - signs in Poway: “Vote Yes on 8: Protect our children”
    - any scientific evidence that extending civil rights to gay/lesbian couples places children at risk?
    - What assumptions does it make about development? About learning? About how we develop sexual preferences and behaviors?
    - an (unsupported) claim about social development
How does brain develop knowledge of social behavior?

After 11 weeks, the expanding cerebral hemispheres have overgrown the diencephalon. At the metencephalon, cortical formation and expansion produce the cerebellum, which overlies the nuclei and tracts of the pons.
Where social *routines* and *knowledge* come from

- examples?
- when do we see social responses? enjoyment? learning?
A social skill “complex”

attention sharing:

...is the foundation of teaching and learning

- what is it?
- who does it?
- where does it come from?
What is attention-sharing?

- do you see what i see?
- looking where someone is looking

- getting someone to look where you are…
Attention-sharing in infants: gaze following (looking where someone is looking)

- why does it matter?
  - use another person to infer what’s important
  - figure out reference & meaning
  - how difficult is this?
A social skill “complex”

attention sharing:
...is the foundation of teaching and learning
  – what is it?
  – who does it?
  – where does it come from?
What’s important to a lemur?

- WHEN, WHY do lemurs watch each other?
- Left: still looking-times
- Right: moving looking-times

H = human; L = lemur; F = food; E = environment
Lemur see, lemur...see.
Getting someone else to look: Merv makes his point

Is pointing a special human social skill?

- No, but how we use it is!
- Used to show, not to get

(photo by David Leavens)
A social skill “complex”

attention sharing:
...is the foundation of teaching and learning
- what is it?
- who does it?
-- where does it come from?
Modeling the Emergence of Shared Attention

- do [early abilities] + [structured environment] => AS skills?
  - early abilities:
    - perception (gaze-shifting; face-perception)
    - emotion (prefer social interaction)
    - learning: (visual “reward”; get tired of looking)
  - structured environment:
    - predictable caregiver actions
  - how can we test these theories?
Early abilities example: infant face perception…

question: do babies more sensitive to an adult’s head angle learn to follow gaze sooner?
The structured social environment

from study of 35 infant-parent dyads at home...
Other related evidence...

Chen Yu, Indiana University
Simulations to test theories of emergence of shared attention

- why simulations?
- use multiple platforms:
  - ANN, virtual environment, robot head
- what do these tell us?
Triesch & Carlson (2003)

red: frequency of gaze shifts to CG

blue: frequency of gaze shifts following CG’s line of regard
Can we simulate autism?

Triesch, Teuscher, Carlson & Deák (2006)
AS as *engine* of development: using it to infer word meanings

- when adult says novel word, how could infant infer meaning?

- Baldwin: 18-month-olds* monitor adults’ attention; infer what they are referring to

- Tomasello & Barton: Toddlers map verbs onto *intended* actions, not accidental ones
Current questions

- How does SA “go wrong?” ex: babies with visual deficits
  - how does SA support language, education?
- Sources of information in infant’s world?
  - regularities they notice & predict
    - relation to activity & experience?
- Neural mechanisms of SA?
  - relation to specialization of face-processing pathways/regions; training of spatial-representation mechanisms
Getting involved

🔹 research in Cognitive Development lab
  - http://www.cogsci.ucsd.edu/~deak/cdlab/

🔹 COGS 160 (Deák)
  - involvement w/ research (3 quarters)
  - permission only, 3.3+ GPA, upper-div courses, desire to learn about research
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