

Lecture 8 Social Attention

Primates: The Eyes Have It!

- Primates are particularly sensitive to faces, and esp to changes in the orientation of attention
 - Direct eye contact is arousing, triggers Sympathetic NS (“Fight-or-flight”) activation
 - **STS** (Superior Temporal Sulcus) detects shifts of head/gaze to/from subject
 - If see approaching eye contact, get ready to engage; Gaze aversion can preclude engagement
- Primates **Monitor Attention** of others as predictor of interest, likely engagement, getting caught, etc.
 - Show gaze following: Many primates good at following change in head direction, some at eyes
 - Perspective taking Use the orientation of other as a factor in decision-making
 - e.g. Subordinate chimp chooses food dom cannot see, over food both can see (Hare et al, 2001)
 - Self-Recognition (in mirrors) in apes; not observed in monkeys – *Self as seeable?*
- **Human** elaborations
 - Shift to collaborative foraging etc (see Lecture 3) placed higher demands on both the socialization of hand-eye coordination (Mirror Cell System) *and* the social coordination of attention (Limbic/Prefrontal, “Theory of Mind” system)
 - Eye contact synchronizes EEGs in mother/infant & adult interactions (*Leong et al 2017; Hari et al 2013*)
 - ‘Eyes & body at’ better than ‘eyes at, body away’: Speech also salient reset (no data on NHPs)
 - **Unpigmented sclera** (unlike darkened sclera in NHPs) makes gaze direction more obvious
 - An anatomical adaptation for improved social coordination of attention?

“Theory of Mind” (“ToM”) – Hominid specialization

- Humans appear to attribute mental states, based on observing attentional behavior
 - I see that you see >> I believe that you know AND ..that you don’t see, ...you don’t know
- **False Belief Task** - Developmental research has converged on “definitive” test for ToM
 - (AKA “Sally-Ann Task”) – Subject observes as...
 - Sally hides object in place A while Ann watches, then Sally leaves, Ann moves object to B
 - Ask subject: “Where will Sally look for the object when she returns?”
 - 2 yr olds “fail” – say Sally will look where subject knows object to be (in B)
 - 4 yr olds “succeed” – say Sally has False Belief that object still in A, so will look there
 - Altho recent data: if task less dependent on language, can do at younger age (Baillargeon et al 2010)
 - Apes also fail, tho do show anticipatory looking to other’s likely next focus (Krupenye et al 2017)

Some Cognitive Implications of ToM

- ToM is actually a suite of abilities, with different developmental rates
 - e.g. Attribution of likes/dislikes (Yum/Yuck) emerges earlier than attrib of diff knowledge states
 - More complex than I see you see = I know you know – Can counter by manipulating how you appear
 - Audience Effects: Individual alters own behavior, attitude to accommodate particular audience
 - Possibly another pressure for tolerated non-reality?
- **Recursion** - Humans capable of multiple embeddings of ToM
 - “I know that she wants him to think that she likes him, but I don’t believe that she does”
 - Note: Making linguistic (but not mimetic??) reference can include to *mental* experiences
 - Hierarchical Embedding, as we’ve seen, is also observed in other hominid cognitive activities
 - e.g. Making a hafted tool, triadic play w/e.g. nested cups, combinatorics like syntax, etc.
- **Intentionality**
 - We view humans as “intentional”: Behavior is presumed to be planned, w/specific goals in mind
 - e.g. In court, pre-meditated murder can carry a heavier penalty than accidental manslaughter
 - e.g. **“Fundamental Attribution Error”**
 - Biased to default to assumption that behavioral outcome intended (vs. caused by external factors)
 - Recall “The Co-operative Primate” (Lec 3) on sharing and the emergence of ethics
 - Humans care about what they SHOULD do, esp when “should” is not necessarily = self interest
 - Further, they care about what others should do – so care about others’ intent (*WHY they do it*)
- **Epistemics** - *What is it to “know”?*
 - Self Knowledge: Humans have subjective “access” to some (tho not all!) of own mental processes
 - Allo-Epistemics: Assess the “knowledge” of others, in part thru mapping to own mental experience
 - Also includes “Epistemic Territory” assumptions re: who has “rights” to authority over which info
 - Indiv authority: 1) my body, thoughts; 2) what I do in world; 3) culture I inhabit; 4) gen knowl
 - We actively negotiate our “Common Ground” during conversation (Clark 1996; Goodwin 2013)
 - We display our “Epistemic Status”, & gain information, using syntactical universals like “wwwwww”
 - e.g. Ignorant asks, informed replies, conversation stabilizes when both informed
 - An information differential is an “Epistemic Engine” of conversation (Heritage 2012)

Differential Access

It is NO COINCIDENCE that the False Belief task mimics the conditions of . . .

- **Fission/Fusion** >> **differential access to information**
 - As subgroup membership changes, individuals' access to each other changes
 - Found in some NHPs (e.g. chimps); Presumed for hominids since at least *Homo erectus*
- e.g. **Hunters/Gatherers w/shared Basecamp**
 - In F/F, spent significant periods apart from others, but increasingly inter-dependent
 - Separated members can miss important info (about foraging conditions, others' relationships, etc)
 - RECALL: In "complex" societies, individuals must monitor relationships of others
- This combination of "**need to know**" under "**differential access**" generates selective pressure
 - Track what others see/know, (in conjunction with co-evolution of others systems) >>> ToM
 - Pays off in opportunities to both EXPLOIT other's ignorance, & to INFORM ignorant others

Exploiting Differential Access

- **Machiavellian Intelligence** - Manipulate others for selfish gain
 - Deception that creates or makes use of differential access
 - e.g. Look/move away from object of interest to distract/move competitor away
 - e.g. Move out of sight of one who might interfere before mating, eating etc.
 - e.g. "Feign" indifference to reduce competition, or display false interest to mislead
- We humans are the masters at deception, pretense, audience-specific behavior, etc!
 - Increased **self control** over facial expression, and ability to form coherent whole-body signal useful
 - i.e. This, then, is another context where **Mimesis (act as if)** could have major payoffs!
 - Linked to Pretending - Creating counter-factuals, possible (and impossible) worlds...
 - Selects, in turn, for Counter-Deception, including perhaps Self-Deception
 - So, we became not only better at deceiving, but also at detecting, thwarting deception

Informing – To redress Differential Access

- While Competitors benefit from exploiting, deceiving, Collaborators benefit from shared info
- **Point, Show, & Tell**
 - e.g. We are only primate that points things out to others (unless NHP is human enculturated)
 - e.g. In language studies, NHPs seldom do "Declaratives"
 - NHPs use Imperatives (request, command) not Declaratives (draw attention, comment on)
 - See last lecture (Development) about altricial infants manipulating the attention of others
- **Teaching** – Providing info, taking into consideration what novice does/not know
 - Underlies much of human (hominid?) cultural development
- **Hearsay** – Info not just from your own senses, but "reality" provided by others
 - Information becomes a social commodity, that can be traded, given, withheld etc.

Co-Evolution & Cultural Evolution: Integrating many factors...

- **Co-Attention to the Details**
 - Becoming "tool dependent" exerts pressure to improve, both to compete & to coordinate efforts
 - Perhaps shift from emulation to imitation = a shift to attending to particulars of objects & actions
 - Plus, directing attention, esp during apprenticeship, may also help differentiate discrimination
 - e.g. Focus on particular tool making/using procedures, Foragers discrim plants & their parts, Hunters point out tell-tale scat & tracks, etc.
 - Note that speech, too, is about directing attention (word highlights object, aspect, etc)
 - Contributes to/conventionalizes not only to what/how we do, but **how we see** ("Professional Vision")
- **Cognitive Niche Construction** (see Laland et al 2000 reading)
 - "NC" = When behavior changes environment, and then that environment exerts selective pressure
 - e.g. Beaver dams change landscape, impact on selection for many species, including plants
 - "CNC" = We create the changes (e.g. tool dependence) which then select for cognitive adaptations
 - e.g. Tools (e.g. tally marks vs. numerals) as conventionalized solutions to common problems also then constrain the type of cognition they require (Hutchins 2005; 2010)
 - e.g. The more deception part of our shared env, the more selective pressure for counter-decept
 - e.g. The more fission/fusion and inter-dependence, the greater selection for ToM --- etc.
 - So involves integration of both cultural and biological evolution