

Lecture 3 The Cooperative Primate

Some cognitive developments in hominids concerned motivation/affect (vs. tool use, reasoning, symbols, etc)

- These changes effect types of behavior seen AND types of reasoning possible
- In particular, humans show far greater tendency to cooperate than any other primate

Cooperative Breeding

- Like some mammals (incl some NHPs), even pre-*Homo* hominids probably “cooperative breeders”
- i.e. Others besides parents involved in child care: **Alloparenting**, perhaps even by non-kin

Cooperative Foraging

- Extremely rare in NHPs (only certain population of chimps appears to hunt cooperatively)
- Hominids, at least since *H. erectus* (poss earlier??), collaborate as Hunters & Gatherers
- e.g. Hunters work together to take down prey more successfully than a single individual
- e.g. Gatherers forage to collect resources to be used by group
- **Base Camps** (first seen in *H. erectus*) established as place where all such resources are SHARED

All humans now show related behaviors that surpass any seen in other primates (“NHP”=NonHumanPrimate)

Food Sharing

- Human infants, from ~ 7 months, give to others (especially food, but also other objects)
- In NHPs, mothers share w/offspring, sometimes w/mates, but almost never hand food to others
- And infant NHPs do not give food or objects to others, even kin

Helping

- e.g. Evidence that *H. neanderthalensis* (“Old Man of Chappelle aux Saints”) took care of lame
- Buried skeleton deformed from birth, lived to old age; presumably with help
- Human infants will pick up objects another appeared to drop accidently, not if dropped deliberately
- Humans report satisfaction from helping others, even non-kin friends or strangers!
- i.e. It feels good to help: Proximate mechanism (giving help is reinforcing) suggests evol payoffs
- WHY help strangers?! No chance of reciprocation, so not “Reciprocal Altruism”...
- ? Hominids mostly interact w/kin, cohorts, so pays off often enough to be basic MO
- ? When see self as good, increases likelihood will do good (see *VonHippel & Trivers 2011*)
- ? **Reputation** - Seen by others, as good choice to invest in as potential reciprocation partner
- Note: Language (gossip, truth/lies) can make/break other’s reputation, or (boast, confess) own
- Can also recognize, use helping by others to **third parties** to guide own behavior
- e.g. 6 mo olds shown “friendly/unfriendly” shapes help or hinder a circle to roll to top of hill
- Then show preference to interact with helping shape (*Kuhlmeier et al 2003; Hamlin et al 2007*)
- Plus, help to learn = **Teach** (intervene in other’s process for other’s benefit)
- Much more to come on this!

Fairness – Humans track fairness (although may then promote or exploit it!)

- Even some NHPs show some evidence of assuring they get “my fair share”
- Brosnan (2006) Subject sees other animal receive better reward than it does for same task
- Comes to refuse poorer reward (previously accepted, when both recv’d it) and/or to do task
- Unlike NHPs, humans also exercise **third party** evaluation/enforcement of fairness
- i.e. Police others’ behavior; Devel elaborate cultural conventions (laws, sanctions) to regulate
- Caching corvids also harass third parties for stealing from others
- Includes monitoring for, sanctioning violations of social “contract”
- e.g. **Reciprocal Altruism** = Agent incurs a cost to benefit another, unrelated individual
- Only a stable strategy if reliably reciprocated (See *Evol Theory* lecture)
- Requires “**Checking for cheaters**”, Sanctioning “free-riders” (those who do not reciprocate)
- We’re specialized to reason about exchange, check for cheaters (*Cosmides & Tooby, 1992*)
- e.g. **Wason Selection Task** Difficult logical reasoning task, error prone
- Unless provided a context of obligation (“social contract”), then task becomes easy
- Shown 4 cards, must decide which is necessary to check other side to confirm rule
- Arbitrary Rule: Given # on one side & letter other, if vowel, number is odd – Difficult
- Contractual Rule: Given un/sealed envelope, w/w-o postage, if sealed, must stamp – Easy!

Ethics

- Cultural norms of proper behavior, maintained via sanctioning by others and internalized dis/approval
- Typical examples relate to above: Do your share. Do not harm others. Serve the common good.
- But note, Coop also entails Competition; as in the formation of coalitions to outcompete others.
- So, above can actually promote **In Group-Out Group** distinctions (e.g. only “help” In Group)
- Marked by cultural differences in behavior, appearance
- Language especially supports these distinctions, since cannot communicate with Out-Group
- Can lead to conflict (war!) between groups (eg *H. sapiens* eliminating *H. neanderthalensis*???)

Let us consider other aspects of Behavior & Cognition that are associated with being Cooperative...

“Social Complexity” (Power not = Rank)

- Most social animals (including humans) have behaviorally-marked Rank relationships
 - e.g. A displaces B (from coveted resource) who displaces C; C salutes B who salutes A; etc.
- **Rank = Power** when Rank *alone* translates into priority of access to resources (food, mates etc.)
 - In such a hierarchy, individuals must cognitively keep track of their own dyadic relationships
 - I am C: To act appropriately when I meet A,B,D or E, I need to know $C < A$, $C < B$, $C > D$, $C > E$
- **Rank not = Power** some of the time, in species that **form coalitions**
 - As when a coalition of lower ranked individuals can gain resources over one of dominant rank
 - (Note dyadic rank relationships still exist in this system, but do not always determine outcome)
 - Signif more cognitively demanding, since now must also track the relationships between others
 - So, such Social Complexity (society with **triadic interactions**) involves Cognitive Complexity
- Thus, in above examples, when see “NEW” behaviors like policing, or recognizing 3rd party help/hinder
 - May NOT be that we evolved the ability to do these behaviors *per se*
 - Instead, arise when add new “Helping Matters” to a system already atuned to Third Party Relations

Hunter – Gatherer Society

- **Meat**, gradually increasing in hominid diet, w/assorted other gathered foods, fuelled brain bloom
 - Even in *H. habilis*, most likely a scavenger, stone tools access marrow, meat, w/o “power-jaw”
- **Fire for Cooking**: “Predigests” food, esp meat and hard to process vegies like roots, nuts
 - Makes those foods more nutritionally accessible, spend less time chewing, digesting
 - Impacts on anatomy: Larger brain, shorter gut, change in teeth
- **Collaboration** = Accomplish together what cannot (as easily, or at all) accomplish alone
 - Requires multiple participants to each do its part and to effectively coordinate with others
- **Roles**
 - Above depends on **Division of labor** (both within & between Hunters and Gatherers)
 - e.g. *H. erectus* esp may have run-down prey; a very different contribution from gathering!
 - e.g. Hunting - Flankers, Drivers & Catchers; Tool maker, Thrower, Processors of carcass, etc.
 - e.g. Gathering – Young collect obvious nuts, older extract roots, more discriminant collect herbs
 - Note many tools probably for gathering; May have been made, used mainly by females(?)
 - Traditional roles filled by diff participants over time, possibly per gender, age, status, etc.
 - Such roles may also accrue status within community, possibly promoting reproductive success
 - May also select for abstract categorization of behavior, since “role” can be filled by various individuals
- **Self Control** Offers advantages in many cooperative contexts
 - Hunters must suppress noise to stalk, postpone action until others in position, etc.
 - **Carry** requires having tool (or food) in hand but inhibit use; Delay gratification
- Also show up in other community interactions
 - Control temper to help diffuse conflict tension (esp in close quarters), promote group harmony
 - Control selfish impulses, not exploit partners, even if could profit otherwise
 - Adopt the emotional state you want to promote - e.g. “Motherese” (see Falk 2004 reading)
 - Deceive - Conceal emotion, control gaze direction, postpone activity until hidden, etc. MORE TO COME
- **Planning**
 - Base behavior on long-term plans; Action in advance of need (Consider *Suddendorf & Corballis* reading)
 - Could be argued for all tool-making, hunting/gathering beyond personal requirements
 - **Caching** – Once devote significant time to making a tool, likely retained, stored, when not in hand
 - Prepare & cache meat/herbs for later cooking, eating, medicinal use when needed.
 - Consider primate-atypical memory req’s involved in tracking what, where, how much stored
 - Other cachers like Corvids develop sensitivity to attention from potential thieves; move to prevent
- **Apprenticeship**
 - Collaboration, as well as hunting & foraging skills, often requires long training, apprenticeship
 - Plus, even when taught, refined skills require time-consuming, effortful practice
 - Depends on provisioning by others, if you are to survive while making, training tools
 - Plus, effort invested to learn, practice, is motivated by cultural expectations
 - Practices that are most easily learned, imitated become cultural norms
- We will discuss cognitive implications of Teaching, including Speech to direct attention, & Theory of Mind