

Primate Communication



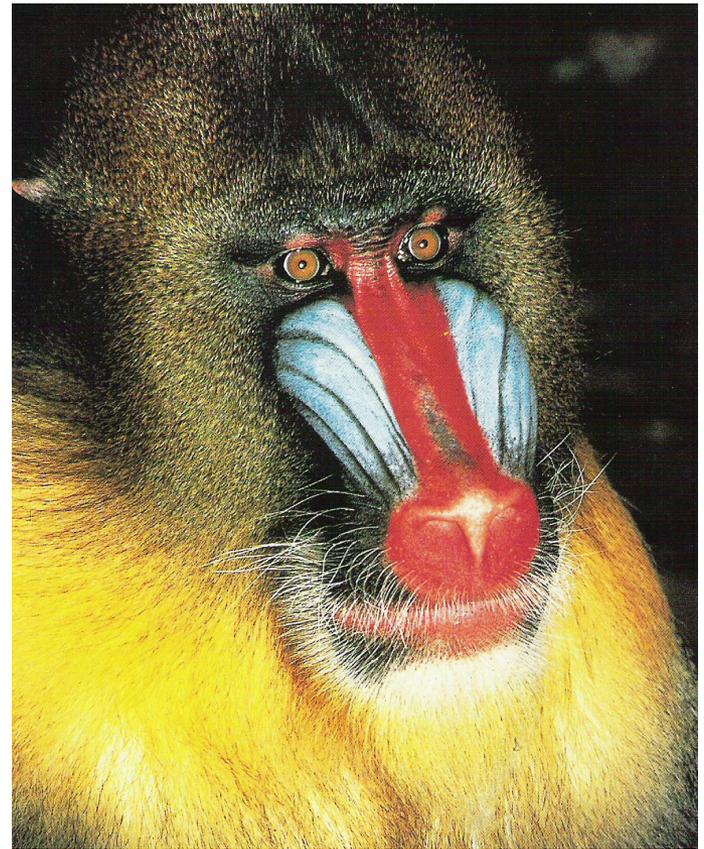
Primates have semi-refined* control of articulated hands, face, & vocal repertoire for a wide range of communicative modalities



* Only “semi” relative to humans!

Reproductive Status

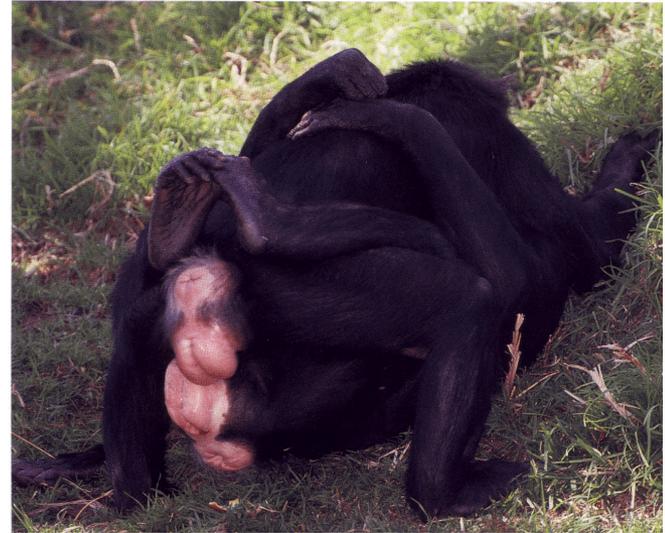
- Important social information
- Much genetically controlled
 - i.e. Morphological, hormonal, etc.



Reproductive Status

Female sexual swellings

- Signal estrous in many Old World Primates
- Visible from far away
- Highly salient to red/green visual opponency



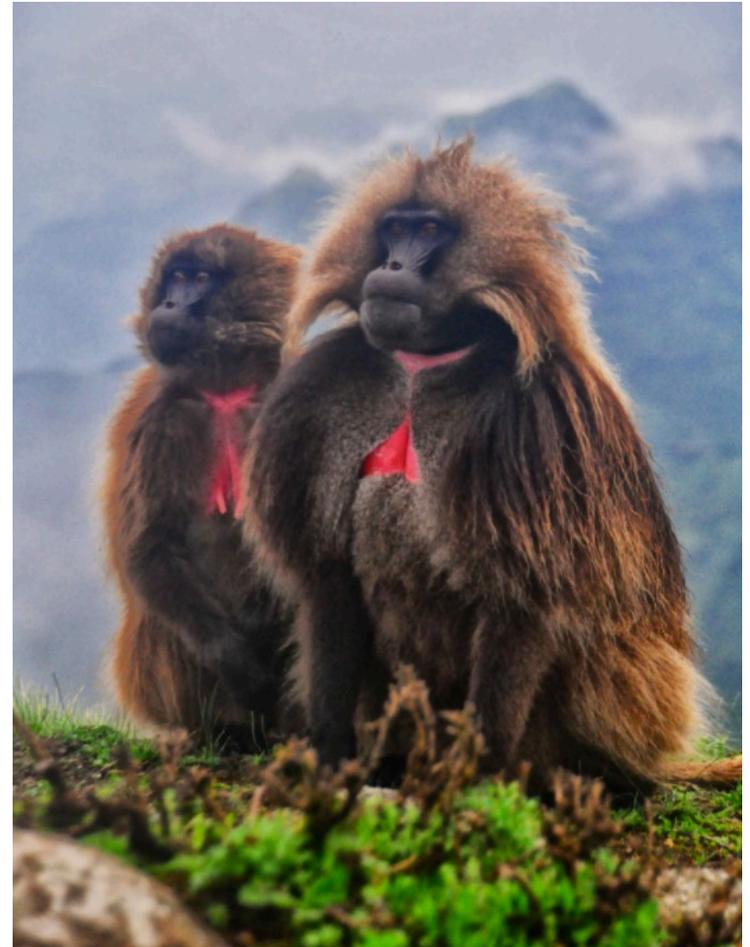
Reproductive Status

Gelada Baboon's Chest Patch

- Becomes bright red in dominant males and sexually receptive females



Dominant male...



...with estrous female

Reproductive Status

- Dominant adult male **silverback** gorilla
 - Develops **Sagittal Crest**



- Distinctive of Harem leader



Reproductive Status



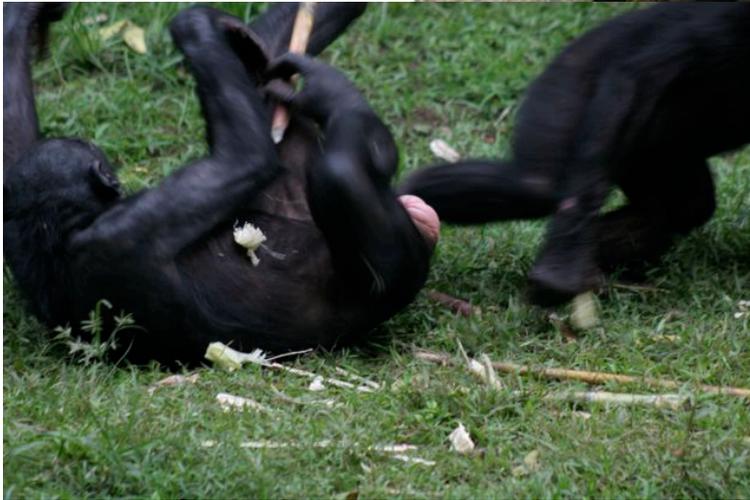
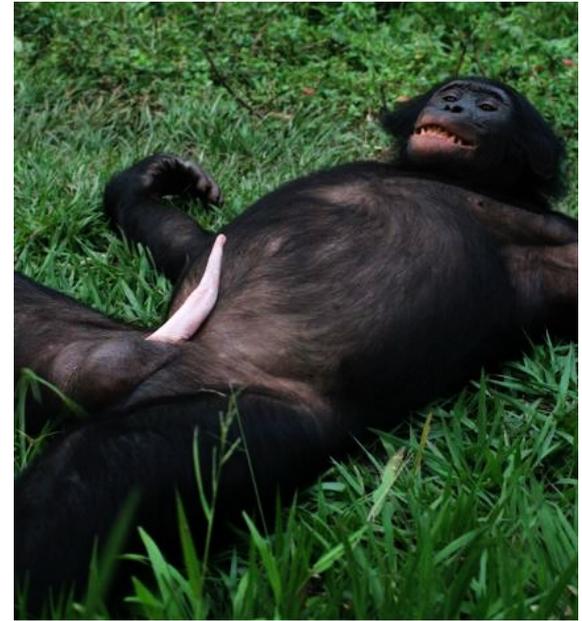
Adult male
Sumatran Orangutan
cheek pads



- Young-adult males can sometimes delay cheek development
- Easier to approach females as “SF”

Reproductive Status

Also
behaviorally
mediated.



- Position body to make signals **salient**
- Usually makes genitals accessible, affords mating

Reproductive Status

- Ringtail Lemur males, during brief mating season, rub wrist gland on tail



While reduced compared to most mammals, **Olfaction** still used to signal, especially re: *Sex!*



- Wave tails as “scent wands”

Reproductive Status

Olfactory signals
NOT just a Prosimian thing...

Cebus

- Rubs gland on chest to scent mark trees
- Does “**urine washing**” to scent own fur



- Can signal gender, reproductive condition
- *Plus* rank, group ID, territory control, etc.



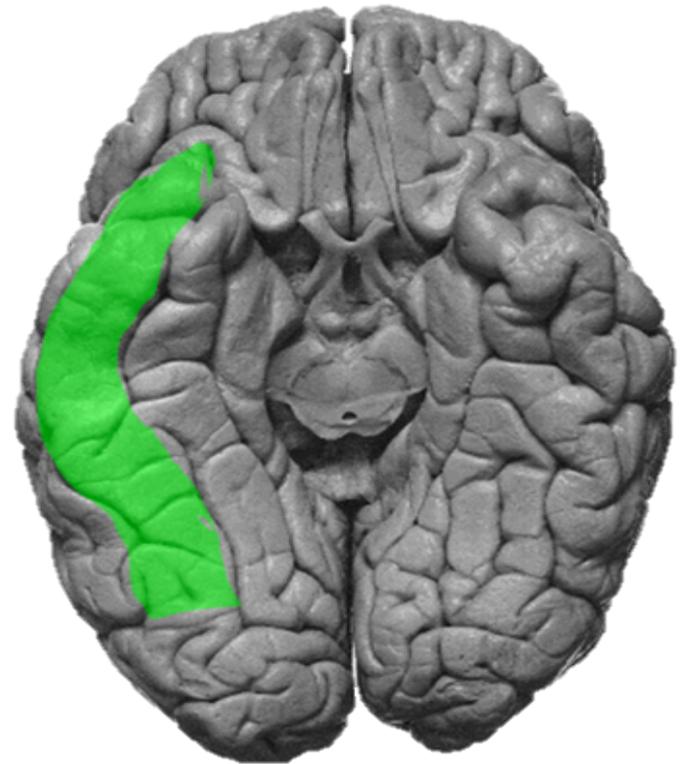
Recognizing Individuals

Primates (like Cetaceans)
live in “individualized” societies

Fusiform Gyrus
for recognizing faces



Chimpanzee



Human

Recognizing Individuals

Fusiform Gyrus
for recognizing faces



Chimpanzee

Primates (like Cetaceans)
live in “individualized” societies

Anterior Temporal
for recognizing voices

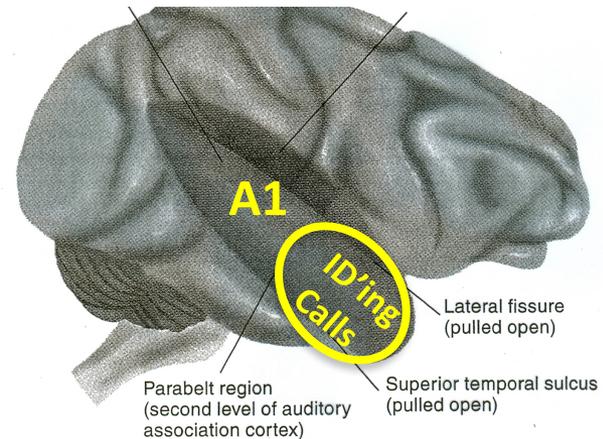


Figure 7.13

A lateral view of the monkey brain, showing the location of the primary auditory cortex, the belt region (first level of auditory association cortex), and the parabelt region (second level of auditory association cortex). The temporal lobe has been pulled down to expose the cortex on the upper and lower banks of the lateral fissure, and the superior temporal sulcus has been pulled apart.

Recognizing Individuals

Primates (like Cetaceans)
live in “individualized” societies

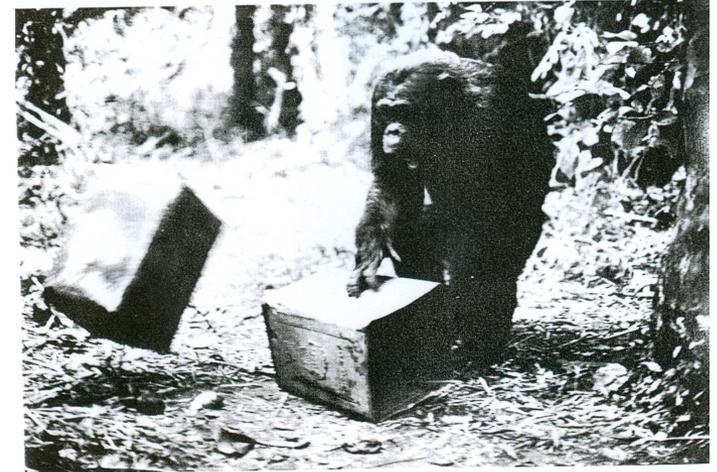
Recall:

Prolonged dependence on learning,

>> many influences shaping individual diffs



Cognitively,
discriminating, classifying **individuals**
(not just gender, age, expression)
required for effective social negotiations



Goodall, 1986

Negotiating Social Engagement

In primates, *“The eyes have it!”*

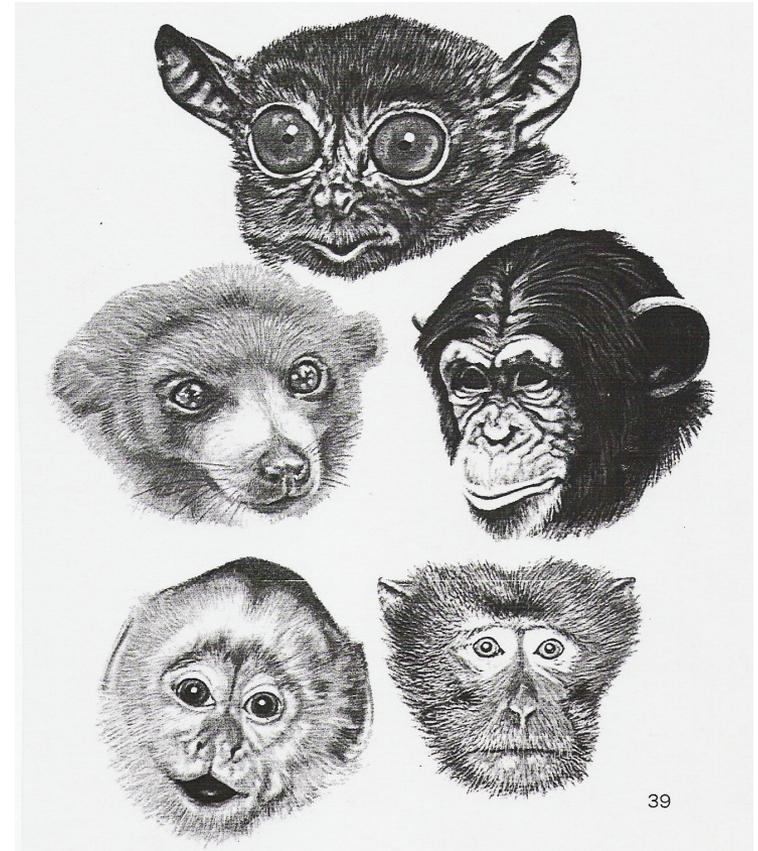
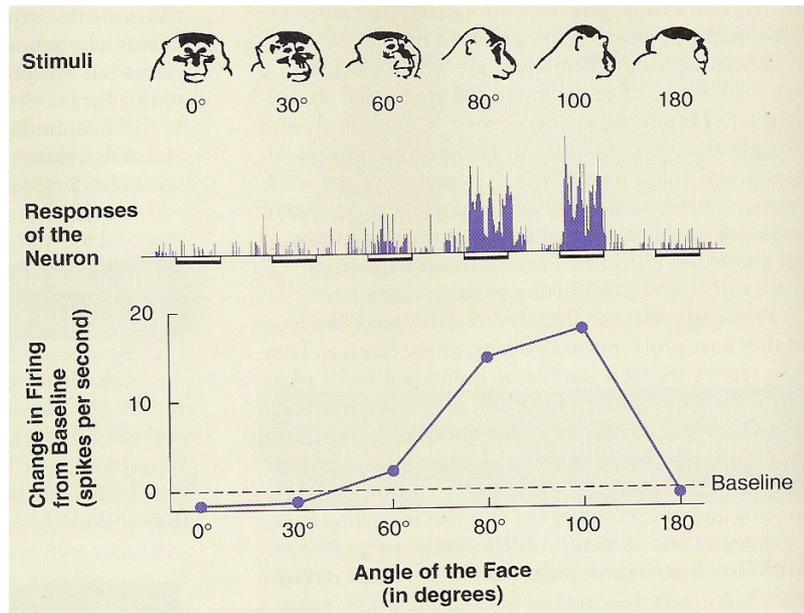
- Many primates’ eyes highlighted with color, high contrast
- Help make signaling salient



Negotiating Social Engagement

In primates, *“The eyes have it!”*

Primates have cortical **“Gaze Cells”** that respond to head and eye direction



Forward-facing eyes
& flattened faces
make face direction a
good predictor
of a primate's likely trajectory

Negotiating Social Engagement

Eye Contact

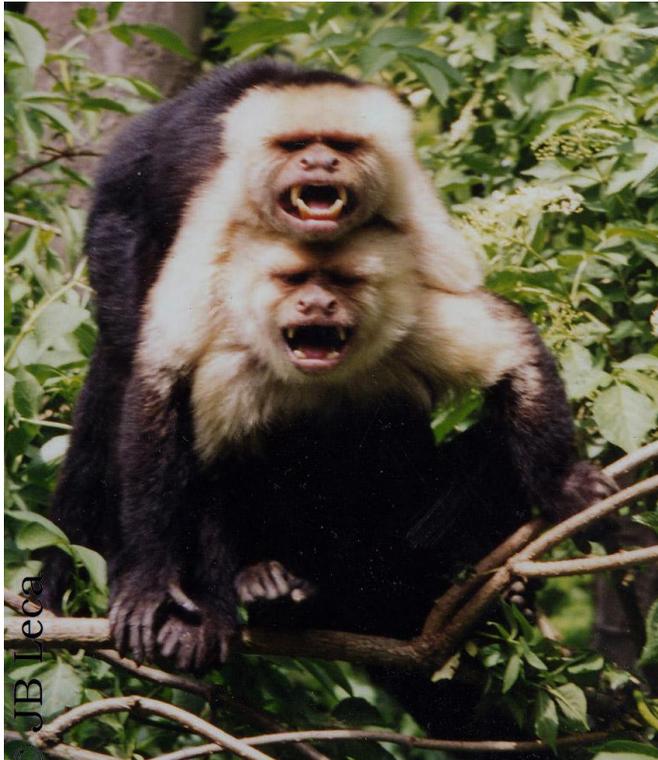
A direct look can be a threat



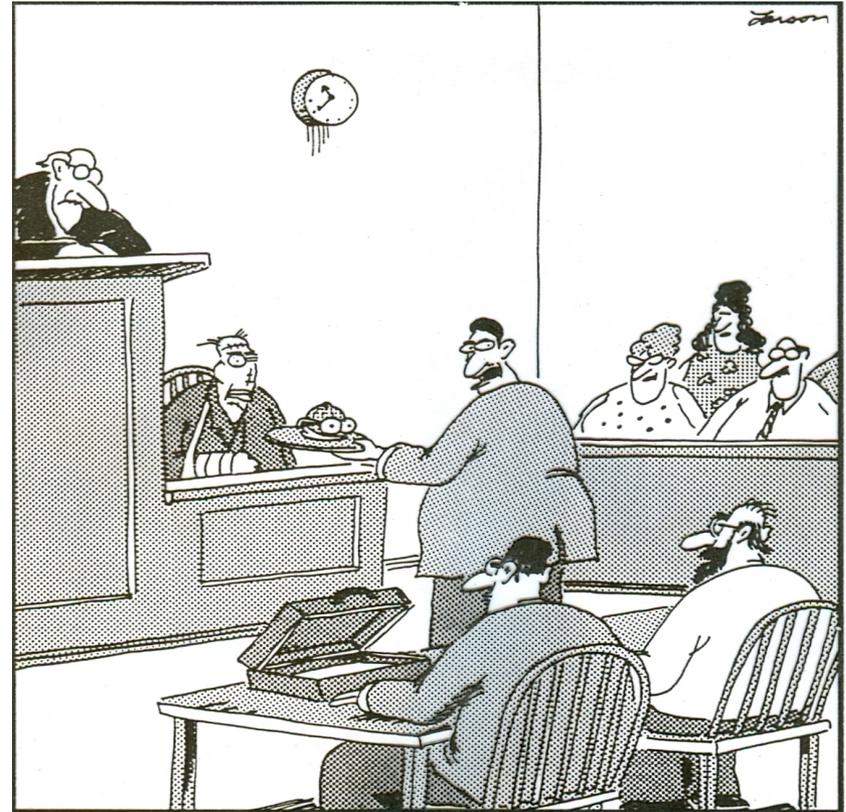
Negotiating Social Engagement

Eye Contact

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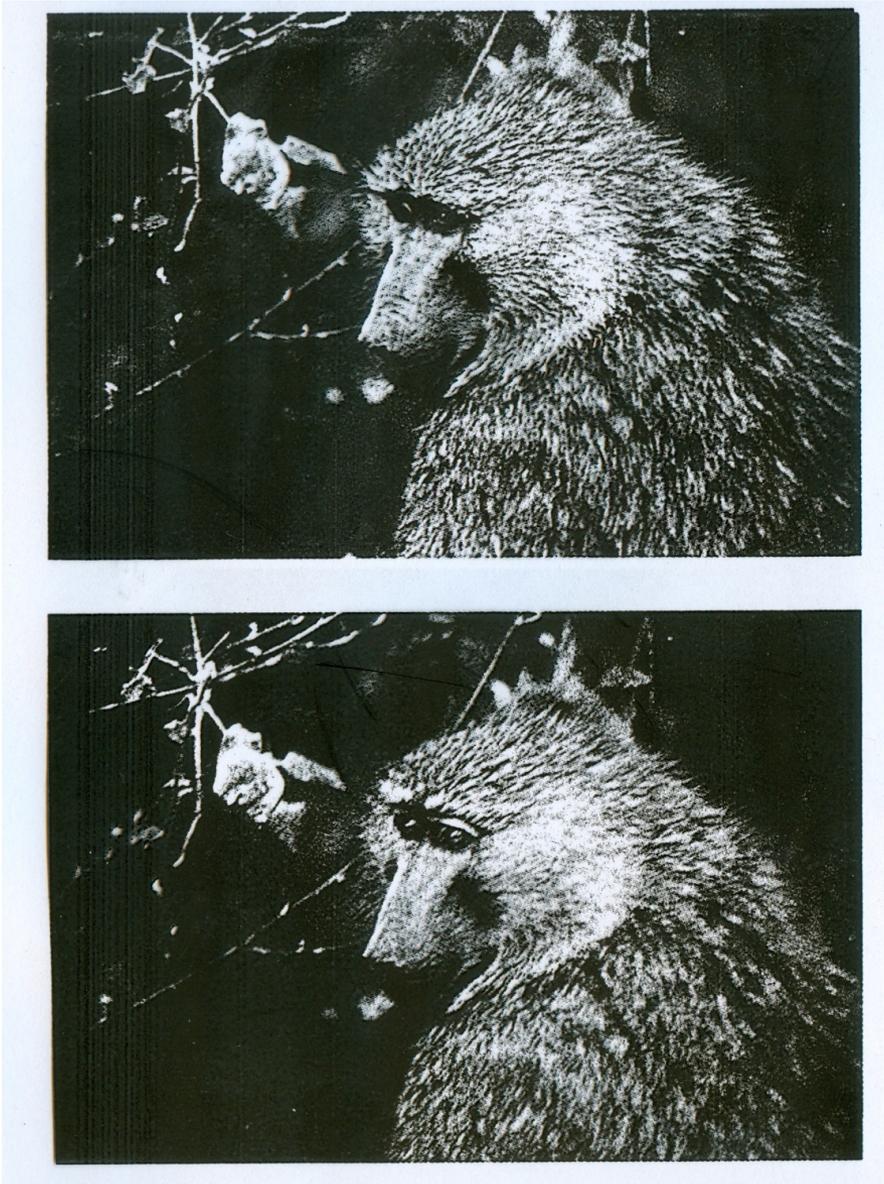


Cebus
“Double-Headed” Display



“So, Professor Sadowsky, you’re saying that your fellow researcher, Professor Lazzell, knowing full well that baboons consider eye contact to be threatening, handed you this hat on that fateful day you emerged from your Serengeti campsite.”

Negotiating Social Engagement



Eye Contact

Can also signal for an engagement to proceed.

e.g. Baboon female
“makes eyes”
(flashes bright eyelids)
to invite male

Negotiating Social Engagement

Gaze Aversion

Preclude (forestall)
engagement



Even deter aggression

Negotiating Social Engagement



Lots more on this to come!

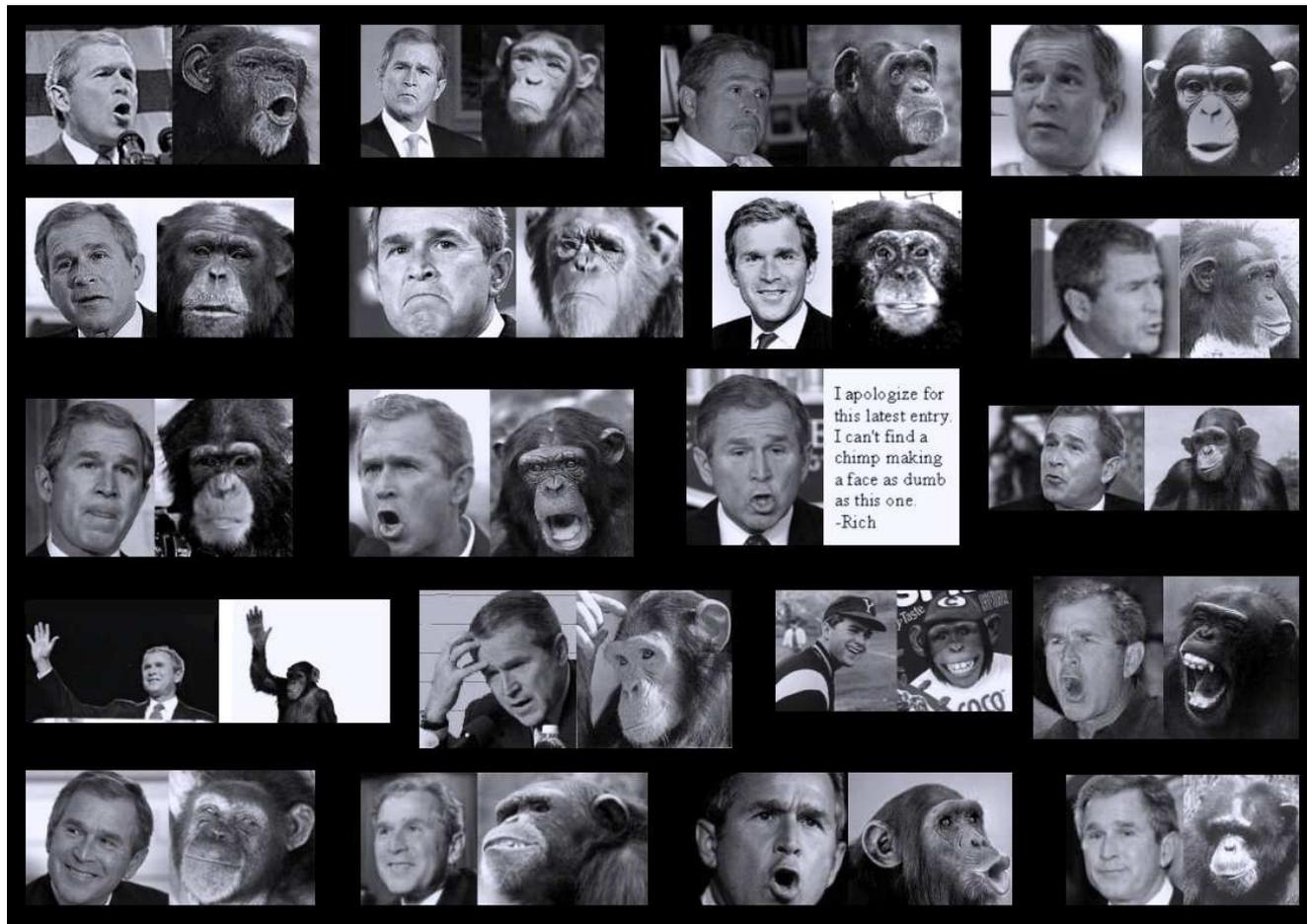
Gaze Following

Demonstrate common interest...



Negotiating Social Engagement

Facial Expressions

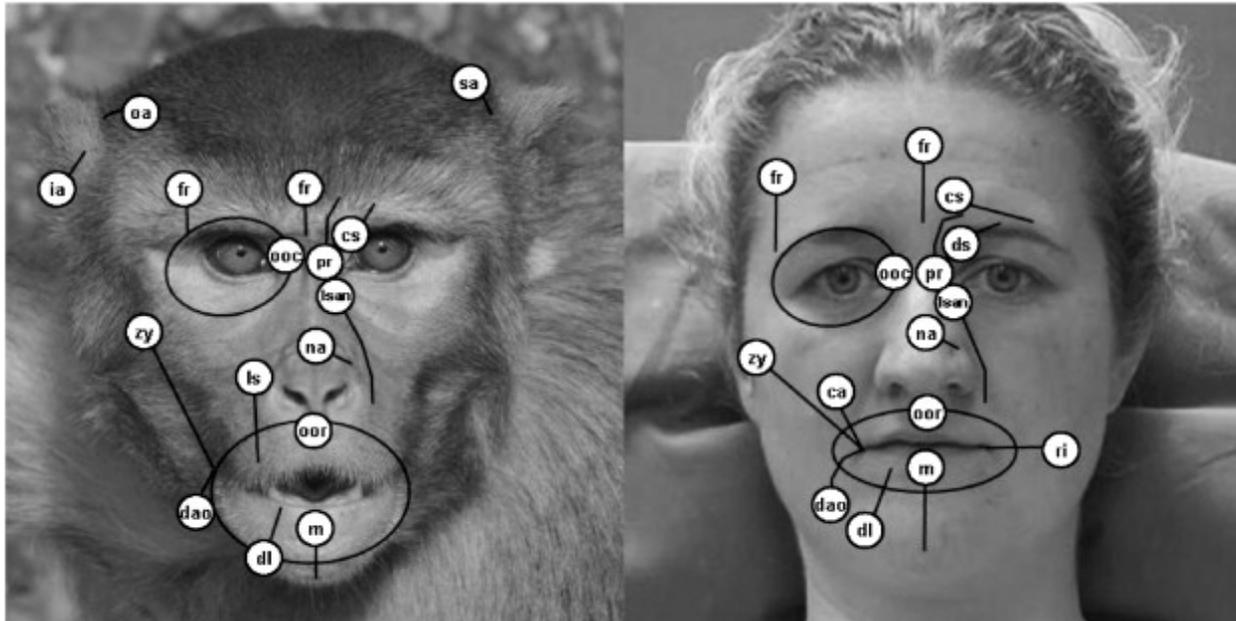


Faces highly malleable – wide range of facial expressions

Negotiating Social Engagement

Facial Expressions

FACS

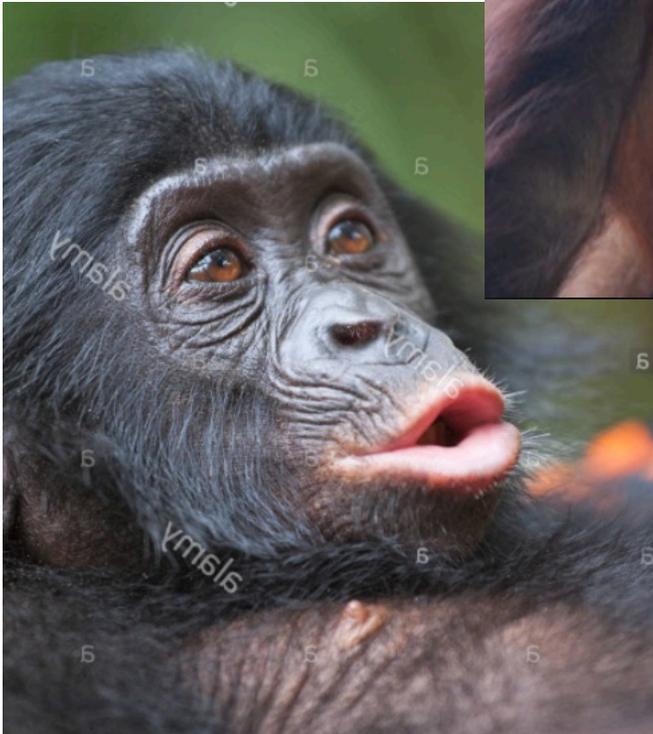


Facial Action Coding System

Negotiating Social Engagement

Facial Expressions

Pout



Negotiating Social Engagement

Facial Expressions

Play Face

An open mouth smile, usually with at least top teeth covered



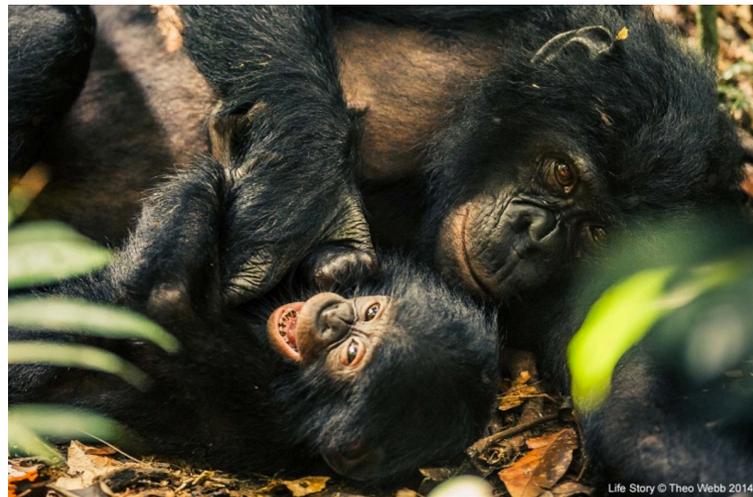
Negotiating Social Engagement

Laughter

Breathy (not voiced) giggle,
open mouth



Facial Expressions



Negotiating Social Engagement

Facial Expressions

Scream

High arousal agitation, fear, rage

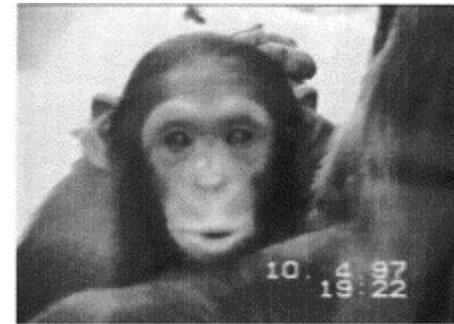
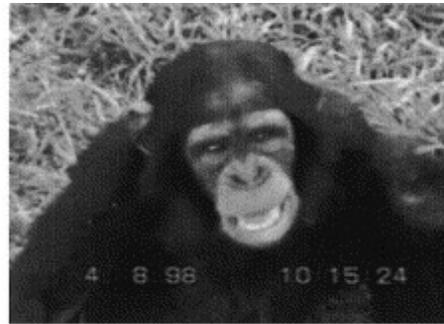


Negotiating Social Engagement

Facial Expressions

Parr (2010) – In Lab, Chimps heard audio or saw video recording of call

- Required to pick “matching” expression from 1 of 2 photos



Pant-hoots & Play-call photos more reliably chosen from Audio sample,
Scream from Video

Antagonistic

Dominant Role



Demonstrate willing/able
to fight

Signals less costly than actual fight



Antagonistic



Dominant Role

Show
TEETH!

“Yawn” as low-level threat,
remind all: Teeth!

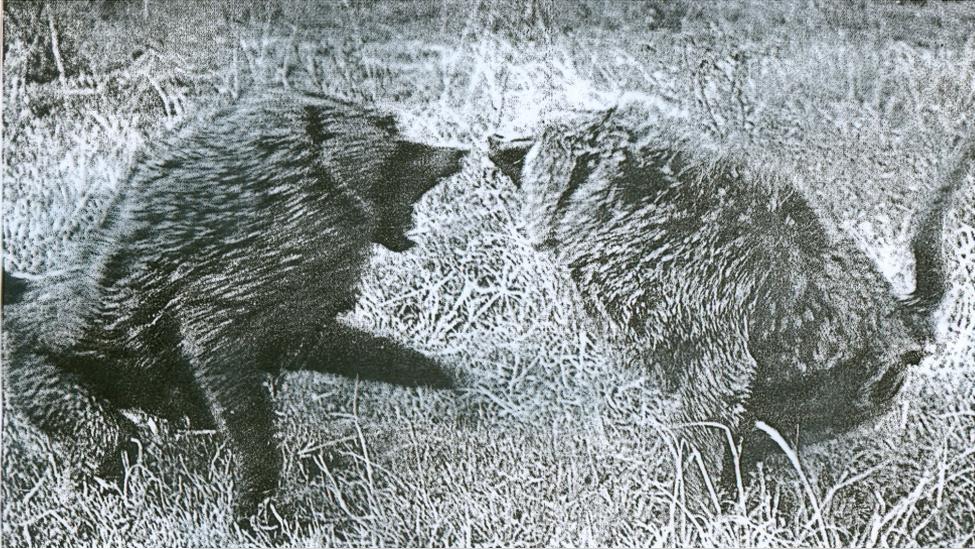


Mark Nichols - National Geographic Magazine / Reuters

“Flip Lip” display in Gelada Baboons

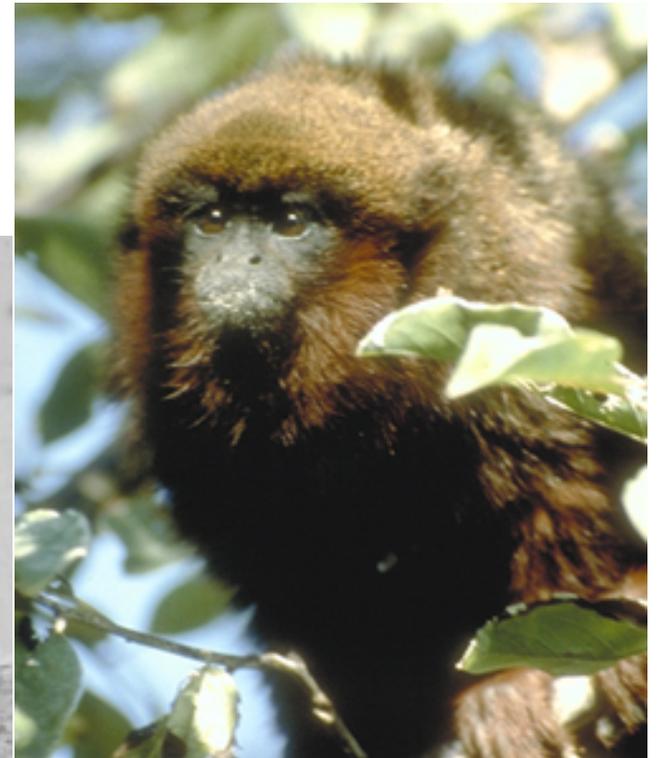
Antagonistic

Dominant Role



Pilo-Erection:

A SNS response
in primates



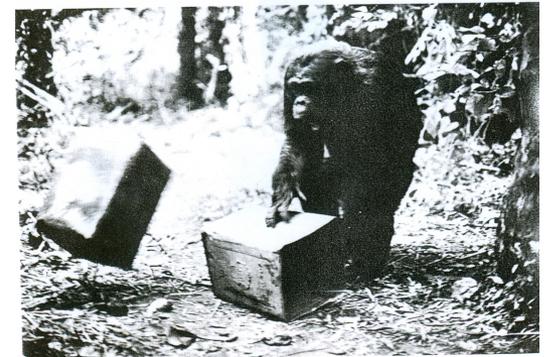
Antagonistic

Dominant Role



Using a substrate

Chimps will rattle branches,
pound on tree trunks -
loudest ruckus wins!

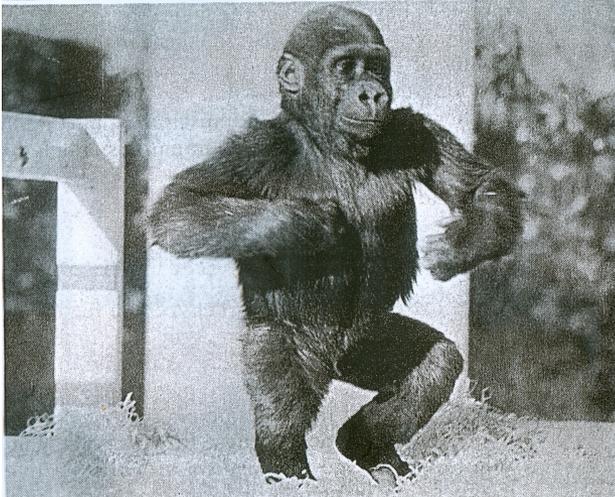


Antagonistic

Dominant Role

Using a substrate

Gorillas chest-pound, w/cupped hands, even without role model



Antagonistic

Dominant Role

Can escalate to fight



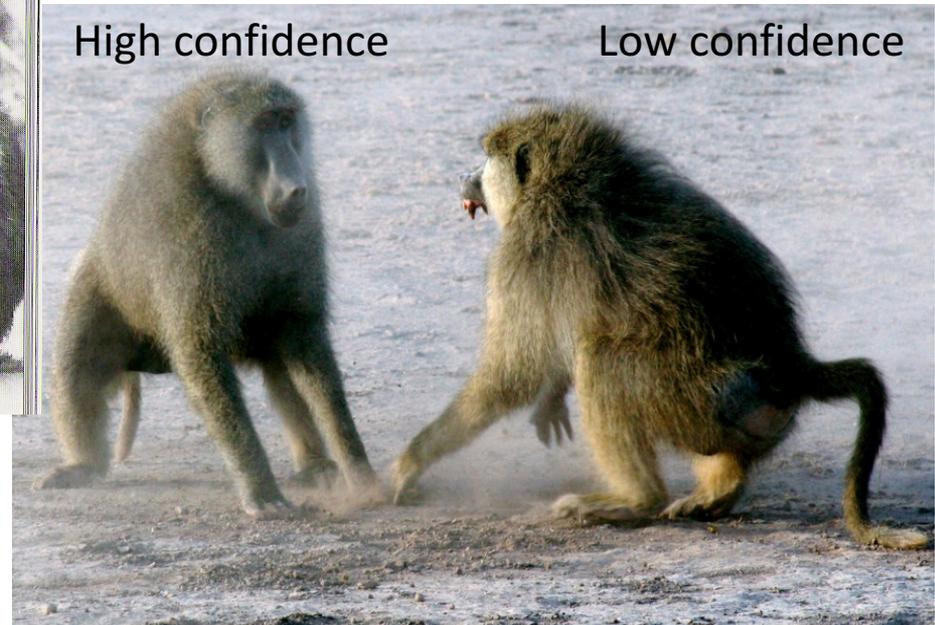
Aggression can be costly



Antagonistic

Sometimes, enacting role in ritualized sequence is enough to keep the peace

Subordinate
Role



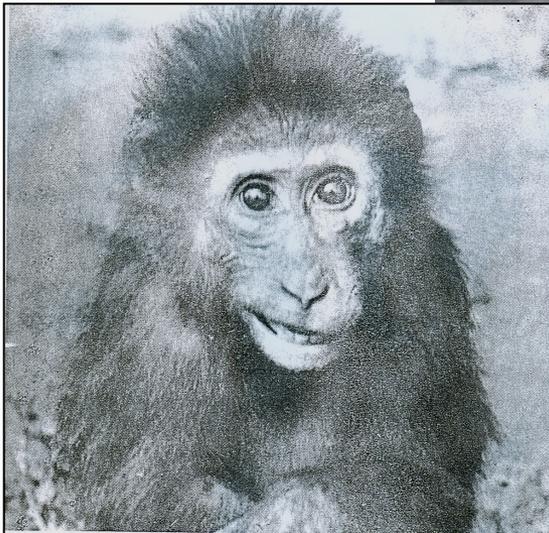
- Bow, make yourself small
- Present to be mounted
- Do not retaliate attack

Antagonistic

“Fear Grimace”



Subordinate
Role



Affiliative



Contact

Hug, Kiss



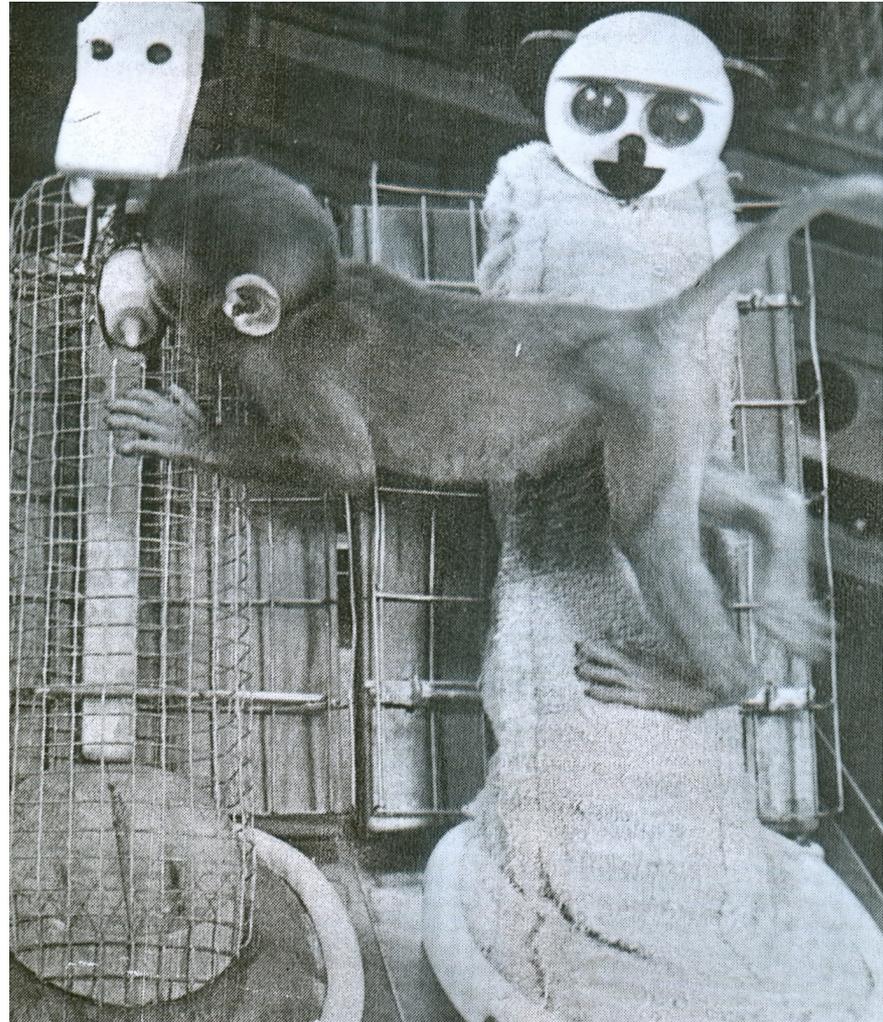
Primates REQUIRE physical contact

Afilliative

Isolates prefer “cloth mother”
they can cling to
over wire mother, even tho
only latter has food.



Contact



Harlow 1958

Affiliative



Contact

Offer support,
comfort



Sometimes used to
support the distressed—

e.g. This infant hugs a
defeated male

Affiliative Contact

Grooming

- *Not* about eating bugs (except fortuitously)



Afilliative

- About calming contact;
proximal and unthreatening
 - Increases oxytocin levels
 - Decreases cortisol

Grooming

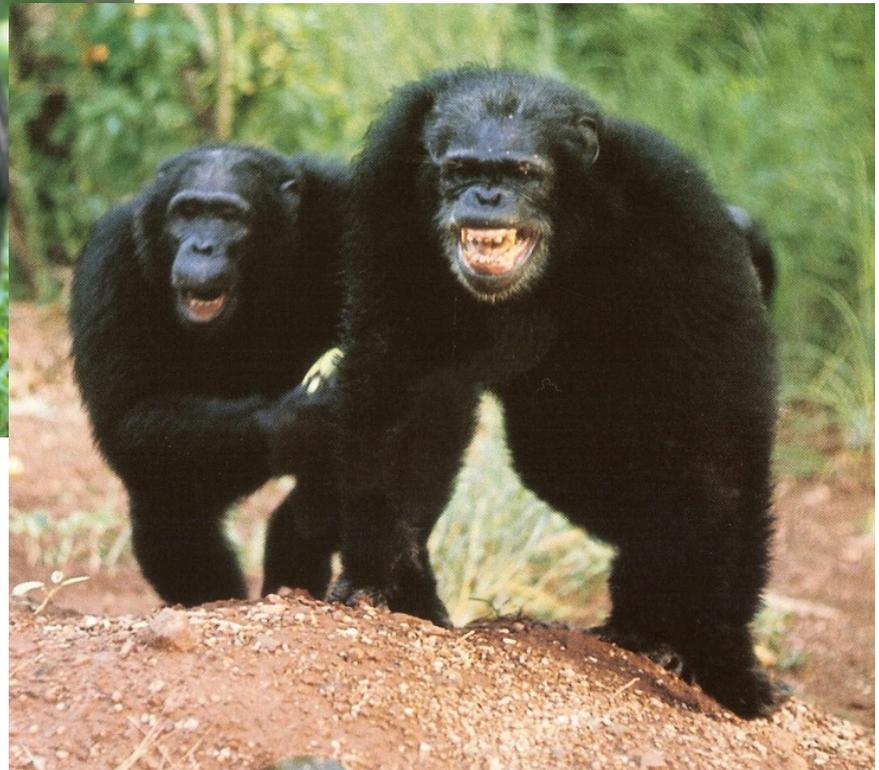


Affiliative



Grooming as “Social Currency”

Associates who recently groomed
more likely to help in attack

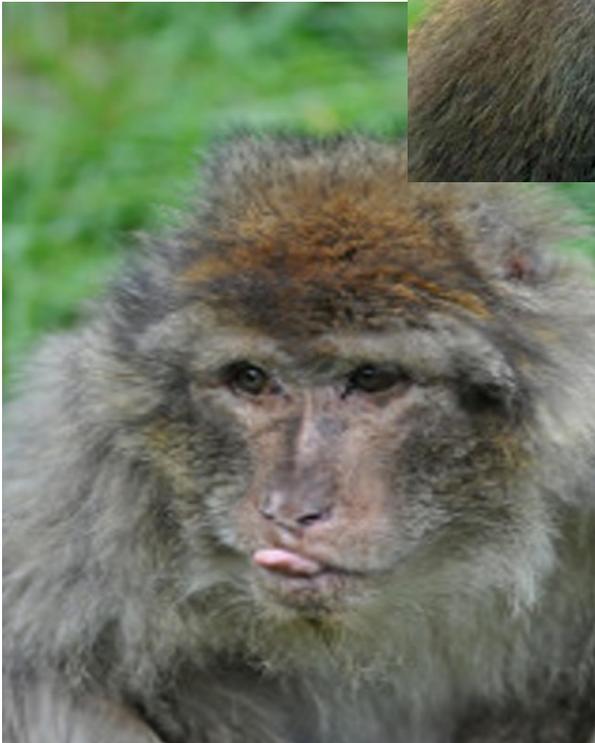


Grooming is an
investment of time, energy,
most often directed to family, allies

Affiliative

Promoting
Tolerance

Lip Smacking





Promoting Tolerance

Leaf Clipping

- By chimpanzees
- Not usually eaten,
just mouthed, focused on

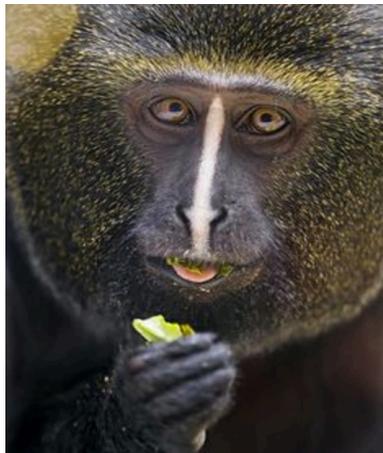
Affiliative

Promoting Tolerance



Lip smacking

Leaf clipping



- These mimic feeding sounds
- Animals while eating pose little threat, so serves to set others at ease

Affiliative



- Seen more often in egalitarian Stumptail Macaques
- than despotic Rhesus macaques (except w/kin)

Reconciliation

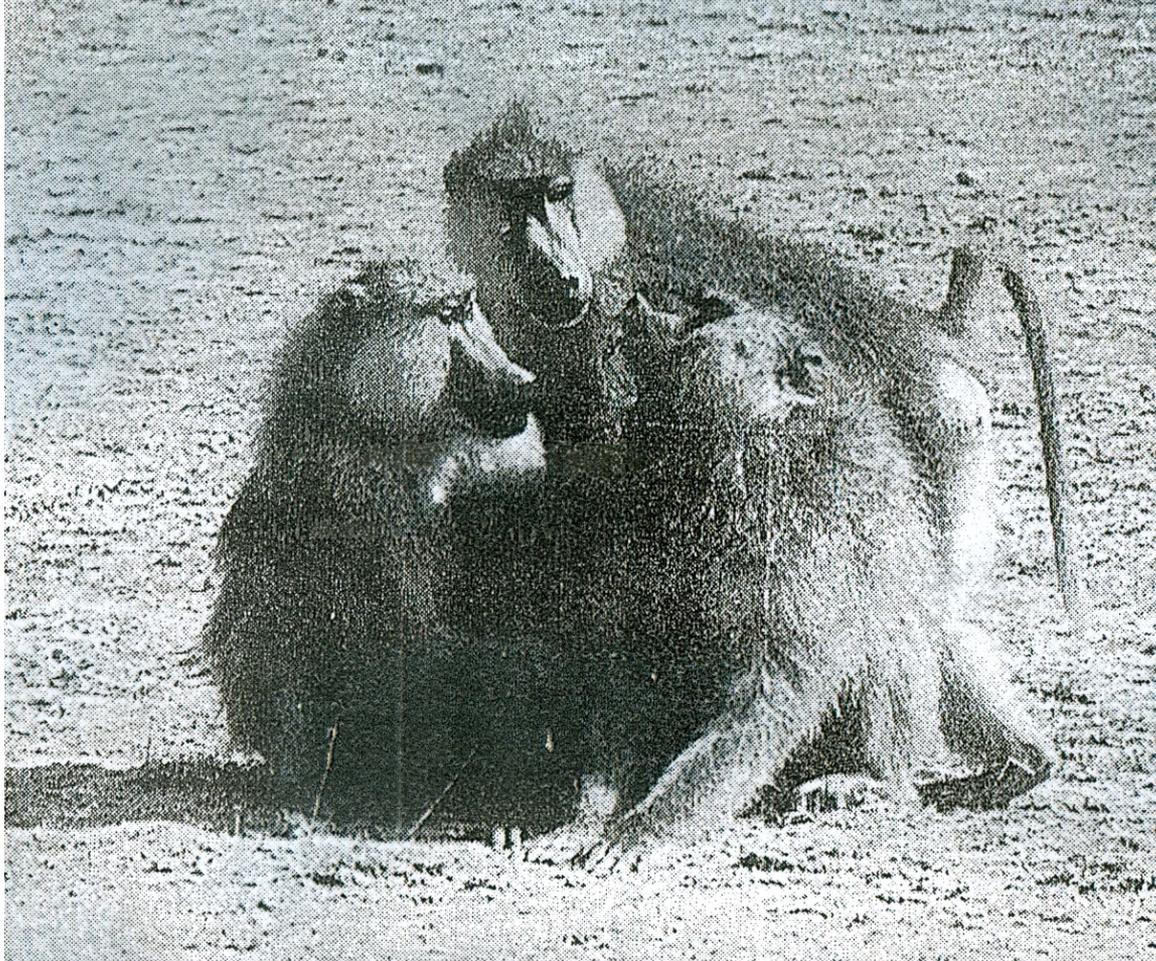
Of many species studied, most do increase grooming, friendly contact soon after fights



Affiliative

Convey “we are one” to partner and to audience

**Coalitional
Displays**



Affiliative



**Coalitional
Displays**

Synchrony



Affiliative



Coalitional Displays



Cebus Allies:
Trust-Rituals involve
potentially harmful behavior
done with great care



Gestures

Prompting others to engage

Beg for reassurance



Begging



Beg for food



Gestures

Prompting others to engage

Bonobos: **“Peering”**

Stare at mouth (not eyes!) of eating other.



An infantile show of respect,
done mostly up the female hierarchy.

Derived from begging, but RARELY involves food exchange in adults!

Gestures

Prompting others to engage

Solicit a Carry

Infant positions itself such that it affords being picked up



Gestures

Prompting others to engage



Solicit Play

- Many different behaviors work
- Often idiosyncratically developed between playmates



Like play itself, tend to be “at-from” behaviors, a little aggressive-a little submissive

Vocalizations

Not as varied or elaborate as in cetaceans



Primates may be capable of exercising more “top down control” of hands, face, than of vocalizations ?

Vocalizations

- “Mammal-typical” repertoire
 - i.e. A relatively fixed set of ~ 12-36 calls
 - Can be loud “broadcast” calls
 - Or directed to particular individual(s) as public or intimate signals
- **“Emotional State/Social Relation”** calls
 - e.g. Baboon (dom) “grunt” vs. (sub) “fear bark”, used to demarcate rank
 - e.g. “Scream” - common call of high arousal distress, rage, esp in aggressive species
 - Can be nuanced to indicate if adversary is kin, neighbor, or stranger
 - e.g. “Whimper” – by fearful infants, submissive adults, or as request for favor
 - e.g. Chimp males will sometimes chorus “Pant Hoots” when troop aroused



Vocalizations

Duets

- Esp in Monogamous species
- For courtship and territory defense



- In Gibbons, male may repeat a sequence, then stop short of end
- If female completes = mate for life!

Vocalizations

Food Calls



If food
is plentiful . . .



. . . some may give
food call.



Vocalizations

Food Calls



Leads to food sharing.

Vocalizations

Food Calls



Although not always...

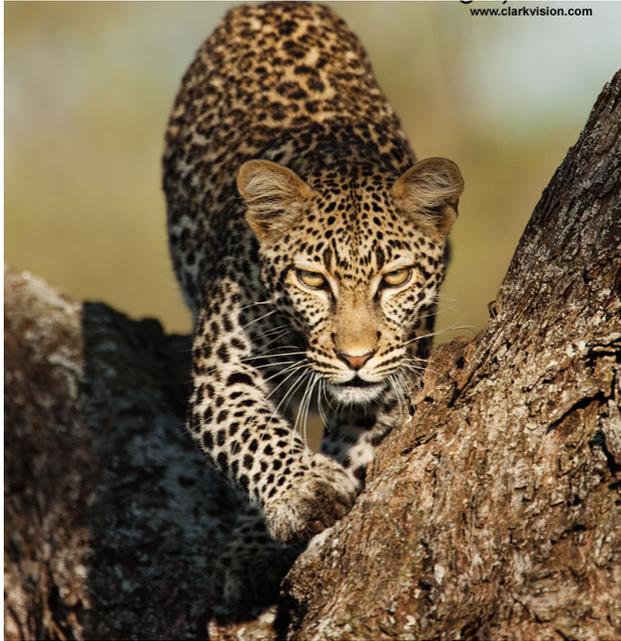
Vocalizations



Alarm Calls

Observed in various species,
best documented in **Vervet Monkeys**

Vocalizations



Leopard



Snakes

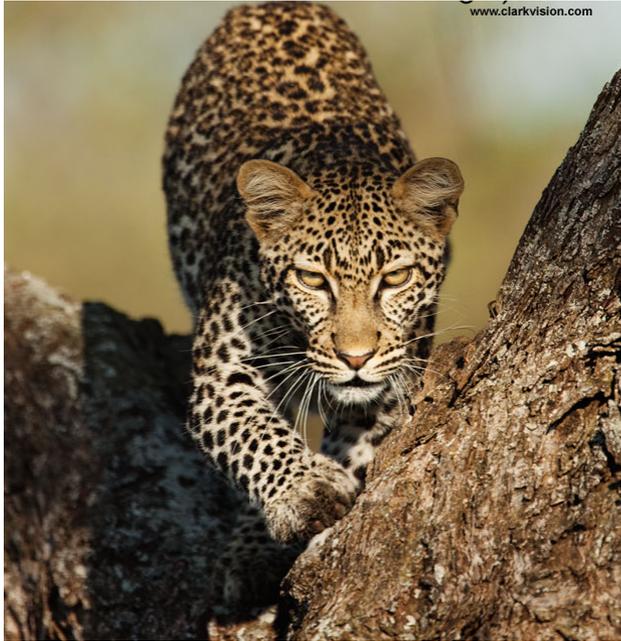
Vervet Alarm Calls



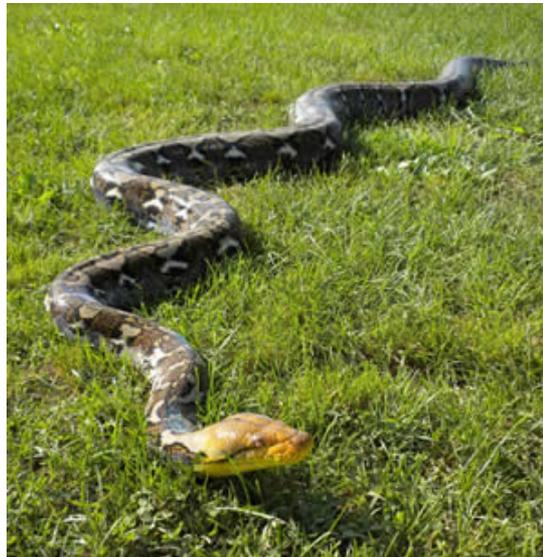
Crown Eagle

Distinctive calls for each predator type

Vocalizations

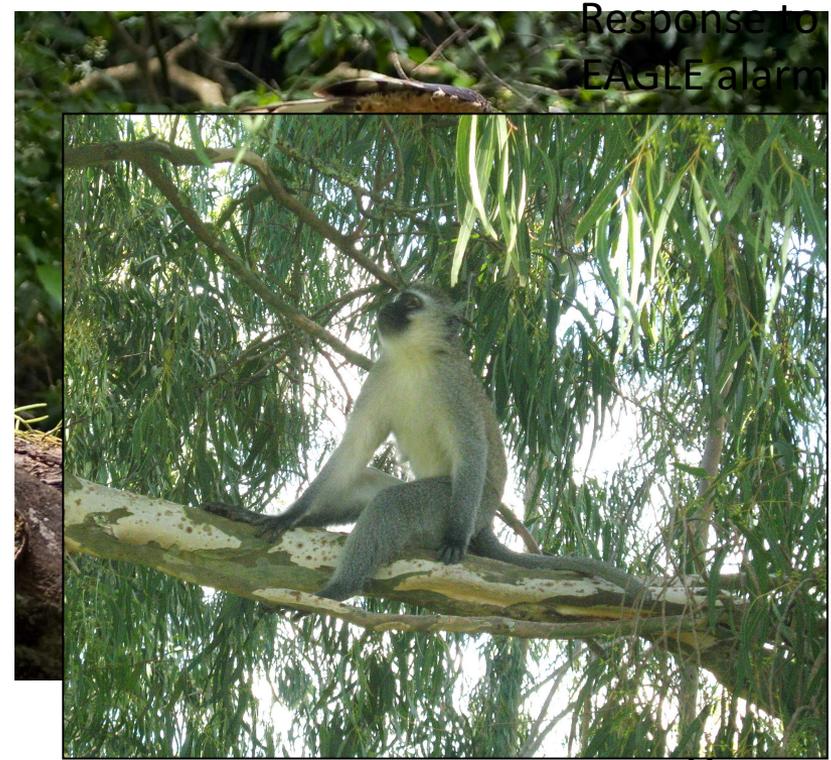


Leopard



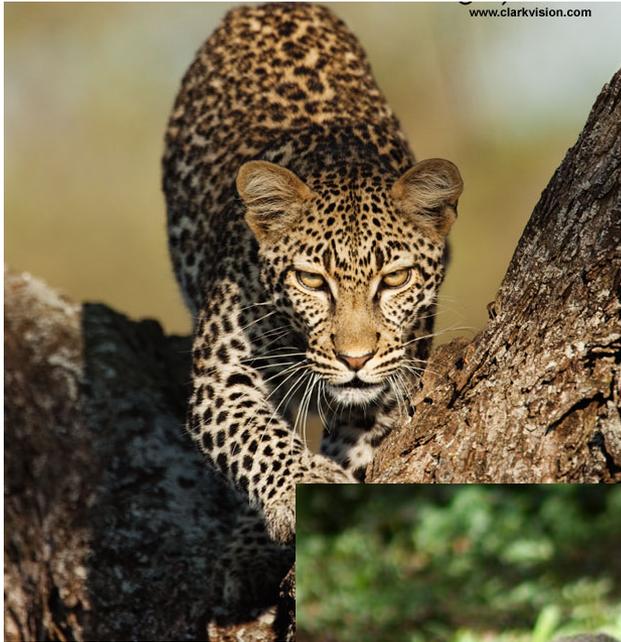
Snakes

Vervet Alarm Calls



Distinctive response to each call type

Vocalizations



Response to
SNAKE alarm

Vervet Alarm Calls

Response to
EAGLE alarm



Distinctive **response** to each call type

Vocalizations



Response to
LEOPARD alarm



Response to
SNAKE alarm

Vervet Alarm Calls

Response to
EAGLE alarm



Distinctive response to each call type

Vocalizations



Response to
LEOPARD alarm



Response to
SNAKE alarm

Vervet Alarm Calls

Response to
EAGLE alarm



So note, not best to think of these
as (proto) “names”