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

**Reproductive Status** - Important social information, much genetically controlled
- Morphological/Hormonal (Note especially use of *color*!)
  - **Female sexual swellings** - Signal estrous in many Old World Primates
    - Visible from far away; Highly salient to OW trichromatic vision with red/green opponency
  - **Gelada chest patch** – becomes bright red in dominant males and sexually receptive females
  - Adult male **gorilla silverback & Sagittal crest** – distinctive of Harem leader
  - Adult male Sumatran orangutan **cheek pads**
    - Young-adult males can sometimes delay cheek development, easier to approach females as “SF”
- Behavioral - Position body to make signals salient to other, which often also makes genitals accessible
- Olfactory - While reduced compared to most mammals, still used to signal, especially re: sex
  - **Ringtailed** males, during brief mating season, rub wrist gland on tail, wave as “scent wand”
  - **Cebus**, uses **gland on chest** to scent mark trees, “urine washing” to scent own fur
  - Can signal gender, reproductive condition, plus rank, group ID, territory, etc.

**Recognizing Individuals** - Primates, like cetaceans, live in “individualized” societies
- Recognize individual faces visually (Fusiforme Gyrus); voices in higher aud cortex (Anterior Temporal)
- Indicates that discriminating, classifying individuals (not just gender, age) required by social negotiations

**Negotiating Social Engagement**
- In primates, *“The eyes have it!”*
  - Many eyes highlighted with color, high contrast; Help make signaling salient
  - Recall that Primates have cortical cells (“Gaze Cells”) that respond to head and eye direction
    - Also that the eyes are the part of the face primates most likely to examine
  - And that eyes, across the phyla, predict direction of movement & likelihood of engagement
    - Turn **flat face** toward X > predicts engage with X, move toward X
- **Eye contact** can be a threat e.g. Double-headed display in Cebus
  - Also can be required before friendly interaction can proceed
  - e.g Female baboons flash eyelids as solicitation
- **Gaze Aversion** Looking away: Precludes engagement, even deters aggression
  - Can also be used to misdirect, by exploiting tendency of others to Gaze Follow
- **Gaze follow** to learn, demonstrate common interest – tied to Social Learning & Social Attention
  - Lots more on this soon!

**Facial Expressions** – primates, esp apes, have highly malleable faces (See FACS for details!)
- Smile, frown, pout, play-face (open smile but top teeth hidden), scream, etc. with many subtle nuances
  - In some species (esp apes) includes **laugh** as when tickled: Breathy (not voiced) giggle, open mouth
- **Parr 2010**: In Lab, Chimps heard or saw video of call, pick “matching” expression from 1of 2 photos
  - Pant-hoots and Play-call photos more reliably chosen from Audio sample, Scream from Video

**Antagonistic**
- **Dominant Role: Threaten** = Demonstrate willing/able to fight to gain access, less costly than actual fight
  - **Teeth**: e.g. **Yawn display** in baboons, shows large canines, as “low level” threat
  - **Pilo-erection**: Raising fur, makes body appear larger, esp while doing **bipedal sway**
    - Humans lost fur but retain vestigial “goose-bumps”, via Sympathetic Nervous System activation
  - **Using substrate** - Chimps will rattle branches, pound on tree trunks;
    - Gorillas chest-pound, w/cupped hands, even without role model
  - **Attack** - Displays can escalate > bite, slap, kick, pin down; Can produce serious injury, rarely death
    - Some attacks more for show – e.g. To aggravate/challenge third party (see next lecture)

- **Subordinate Role: Submit** = Sometimes, enacting role in ritualized sequence enough to keep the peace
  - Bow, make yourself small, present to be mounted, do not retaliate attack
  - **“Fear Grimace”**: Full teeth but cringing “smile”, indicates submissive but friendly
Affiliative

- **Contact**: Gentle, sometimes prolonged; Tends to calm participants, solidify social bonds, builds trust
  - **Hug, Kiss**: Primate need physical contact; Monkeys reared alone prefer cloth mother to wire w/food
  - **In Pan**: includes comforting the losers in a fight, even by youngsters
- **Grooming**: Pick through other’s fur with fingers, mouth. (Can also self-groom, esp when anxious)
  - **Not** about eating bugs (except fortuitously) but about calming contact; proximal and unthreatening
  - **Increases oxytocin** levels, decreases cortisol
  - Often serves as *social currency*: e.g. Associates who recently groomed more likely to help in attack
  - It is an *investment* of time, energy, most often directed to family, allies
- **Promoting Ease, Tolerance**
  - Many species “lip smack”, and Chimps do “leaf clipping”, esp while avoiding eye contact
  - These mimic *feeding sounds*: Animals while eating pose little threat, so serves to set others at ease
- **Reconciliation**: Increased tendency to engage in affiliation following agonism
  - Compare likelihood of affiliative interaction w/in 10 min of agonism vs. of random proximity
  - Of many species studied, *most do* increase grooming, friendly contact immediately after fights
  - e.g. Seen more often in egalitarian Stumptail than despotic Rhesus Macaques (except w/kin)
- **Coalitional displays**: Convey “we are one” to partner and to audience
  - Use proximity, *synchrony* (e.g. baboon males move shoulder-to-shoulder), support in fight, etc.
  - Also other bonding behavior (e.g. grooming) can signal others that a coalition is building
  - Cebus coalition *jest/display* their bonds with potentially-harmful but gently-practiced rituals
  - e.g. *Take turns sticking finger in eye*, up nose, chewing on/sucking body parts etc.

- **Gestures**: Prompting others to engage
- **Begging**
  - **Infant begs from mom**: its hand or mouth to her hand or mouth, sometimes w/whimper & pout
  - In bonobos, beg has become ritualized in adults as “peering” (stare at mouth of eating other)
  - Very rarely does adult gain food; Performed mostly up female hierarchy, as a sign of respect
- **Soliciting a Carry**
  - Infant positions itself such that it *affords being picked up* (in front of mom, leans back, reaches up)
- **Soliciting Play**
  - Usually, tho not always (e.g. “mock fights” can be pretty aggressive!) marked as “play” e.g. by playface
  - Like play itself, tend to be “at-from” behaviors, a little aggressive-a little submissive
  - Many different behaviors work, idiosyncratically developed between playmates (see Soc Learning Lec)

**Vocalizations**: Not as varied or elaborate as in cetaceans;
- May be capable of exercising more “top down control” of hands, face, than vocalizations?
- **“Mammal-typical”** repertoire, 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” – made by fearful infants, submissive adults, or as request for favor
  - e.g. Chimp males will sometimes *chorus* “Pant Hoots” when troop aroused
- **E.g. Duets** for courtship & territory defense, in monogamous species
  - e.g. In gibbons, male may repeat a sequence, then stop short of end, if female completes = mate!
- **E.g. Food Calls in Chimps** – If find fig tree w/lots of ripe fruit, then call; If little ripe fruit, then don’t
  - Often results in sharing *with kin*, but broadcast call also attracts *non-kin* & *some sharing occurs*
- **E.g. Vervet Alarm Calls** - diff for *Eagle, Snake, Leopard*, provoke appropriate defensive response
  - *Eagle*: Move to center of tree, *Snake*: Stand up & look around, *Leopard*: To outer tree branches
    - So note, not necessarily best to think of these as (proto) “names”