Notes on Evolution of Language/Gesture:

How to approach the question?

Animal communication

- Butterflies & pheromones
- Social insects’ trophallaxis (ants, termites, bees, wasps)
  - ants
  - wasps
- Social primates (e.g., chimps, baboons)
- Vervet monkey calls
- Dolphins, whales, etc.

Beyond animal communication: Evolution of Language (!?)

- No clear answer, no clear theory, …
- “Human language is an embarrassment for evolutionary theory” (David Premack)
- Language has “obvious” advantages … (!?)
- Evolution of “Language” (… but, what counts as “Language”?)
  - Syntax? Vocalization? Semantics? Pragmatics of social interactions?

Pre-adaptation? Exaptation?

- A feature in an organism may be evolved for some other purpose than it currently serves.

- Example: Bird Feather
  - Not evolved for flying
  - Evolved for heat insulation
  - Later used for flying
Origin of language: (at least) 4 ways of thinking

- Exaptationist
- Cultural evolutionist
- Naïve Evolutionist
- Pre-adaptationist; Exaptationist

Sub-faculties to be considered

- Vocal Learning
  - From intentional respiratory control
- Syntax
  - From sexual displays that are sequentially organized, such as dance and song
- Semantics
  - From hard-wired, situation specific communication signals (i.e., alarm calls)
  - To meaningful action coordination

Species that show vocal learning

- 81 species of whales
- ~5000 species out of ~9000 species of birds (songbirds, parrots, and humming birds)
- Only one species of primates out of ~220

Sub-faculties and exaptations

- Vocal Learning
- Syntax
- Semantics

Faculties of vocal learning, syntax, and semantics (at least) merged together to enable language

Okanoya, 2006
Species that learn vocalizations

- Some whales
- Some birds
- One primate (!)
- Common anatomical feature: Direct pathway from motor cortex to medullar respiratory/vocal nuclei

Reasons for having the direct path

- Birds and whales: accurate respiratory control when flying or submerging
- Humans: ????
  - Baby cry hypothesis (Okanoya et al 2002)
    - No other primates cry as much as human babies
    - No risk of predation by crying
    - Manipulation of caregivers via crying was effective

Cry development in human infants

Baby cries begin as repetitions of simple elements.

Baby cries become complex both acoustically and syntactically after 1 month. This maybe related with myelinization of the direct pathway.

Mutual segmentation of baby cry and mother semantics
One hypothesis: Gestures first, then language

- Not a new idea, really (Condillac, 1746)
- “Sign languages” (W. Stokoe)
- “From Hand to Mouth” (M. Corballis)