

Vocal and Visual Communication (2)

- Part 1: Anthropocentric research program
- Part 2: Evolutionary research program

Topic: Sexual Signals

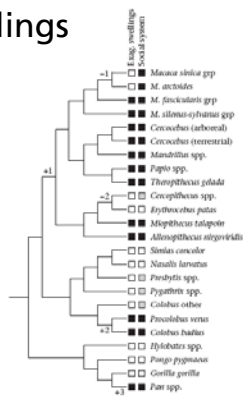


Swellings



Copulation calls

Female Swellings



What do swellings advertise?

- Lifetime reproductive success?
- Likelihood to ovulate?
- Likelihood to conceive?



Domb & Pagel 2001

Quality?

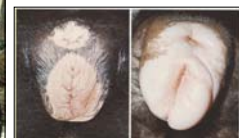
- Study by Domb & Pagel in Olive baboons: Swelling size correlates with
 - Age at first conception
 - Offspring/year
 - Surviving offspring/year
- Critique by Zinner and colleagues
 - Did not control for body size
 - Data from several groups pooled
 - Reanalysis did not confirm findings



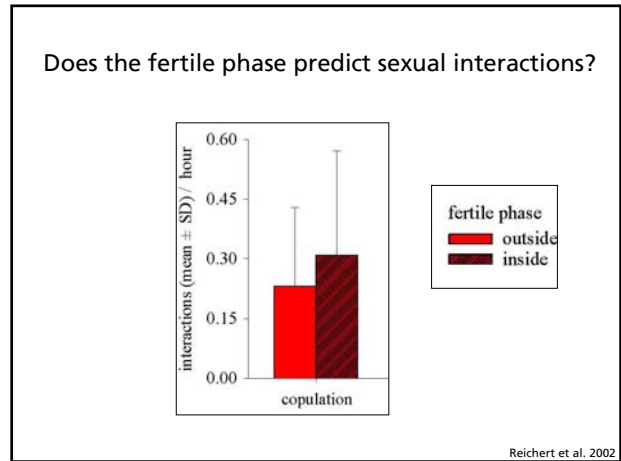
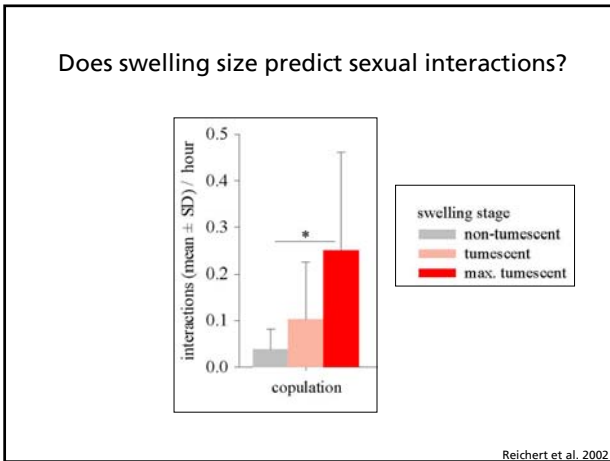
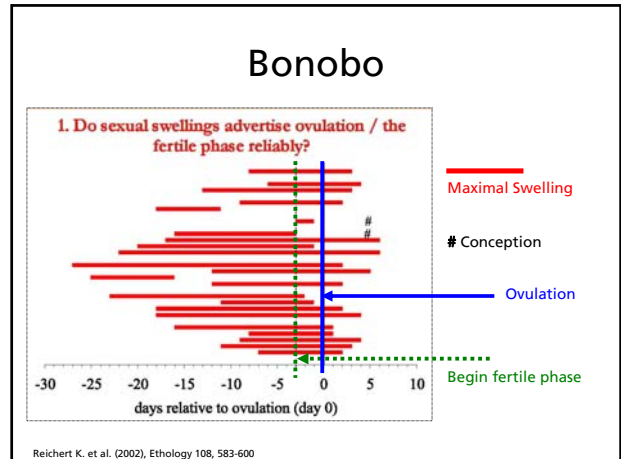
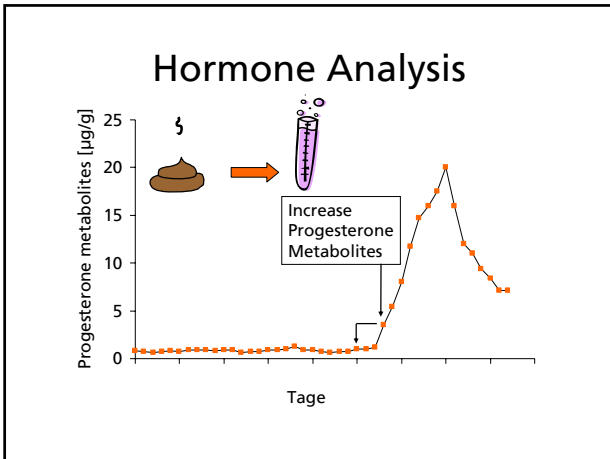
Domb & Pagel 2001

Domb & Pagel 2001, Nature; Zinner et al. 2002, Nature

Likelihood of ovulation?



Reichert. et al. 2002



Honest Signal of Ovulation?

- Swelling does not predict ovulation very accurately
- Sexual interactions increase with increased swelling size
- But no distinction between fertile and non-fertile (swollen) phase

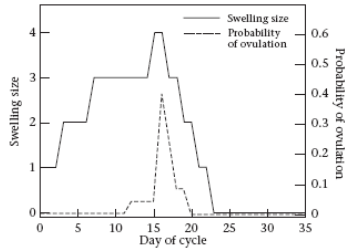
➔ Not an honest signal of ovulation

Reichert et al. 2002

Is that so?

- Definition of 'honest': „honest on average“
- It pays the recipient to NOT ignore the signal...
- Signal has information value
- 2 Strategies
 - Induce male interest
 - But do not give away exact timing of ovulation
- „Graded signalling hypothesis“ (Nunn 1999, AB)

A graded signal



Data from 12 female baboons across 66 menstrual cycles

Wildt et al. 1977 aus Nunn 1999

Swellings

- Lifetime Reproductive Success – controversial
- Likelihood to ovulate – yes, to some degree
- Likelihood to conceive – no data

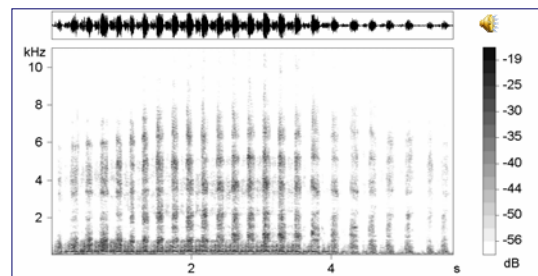


Dombo & Pagel 2001

Sexual Signals II



Barbary macaque mating call



Dana Pfefferle



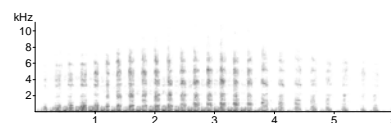
Keith Hodges



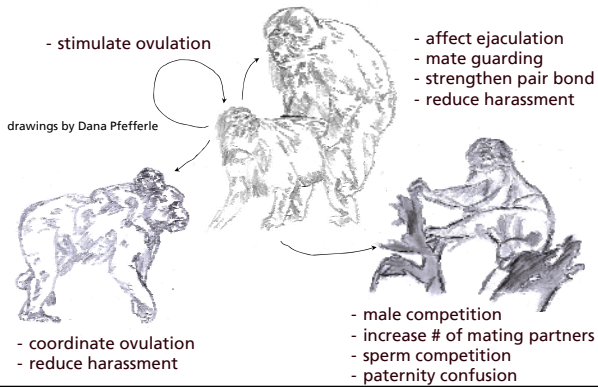
Michael Heistermann

Barbary macaque females

- Seasonal breeders, females sport conspicuous swellings
- Females are assertive, mate with almost all males in the group
- Females utter rhythmic series of pants during copulation

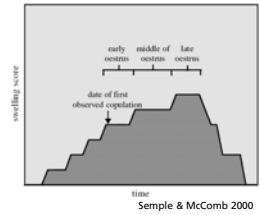


Targets of Female Copulation Calls



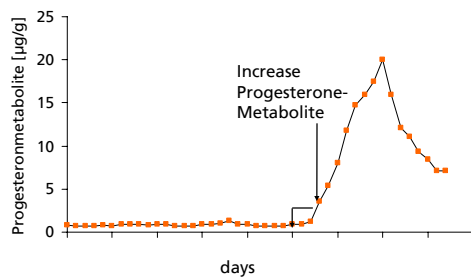
Previous findings

- Semple & McComb (2000): Female Barbary macaque copulation calls from the beginning of the cycle differ from those given during peak swelling

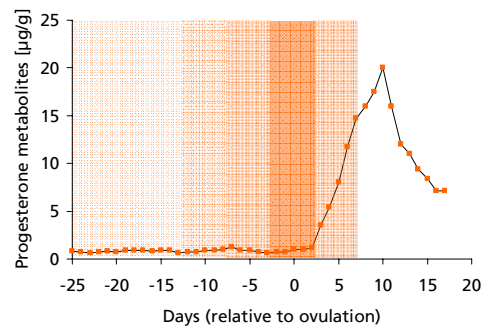


- But how do calls vary throughout entire cycle?

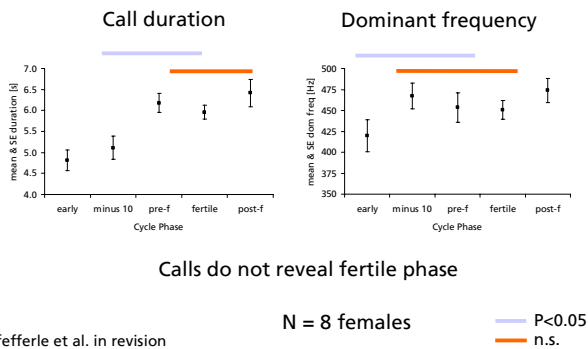
Hormone Analysis



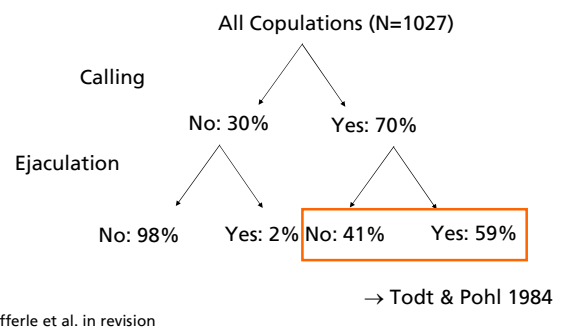
Definition of cycle phase

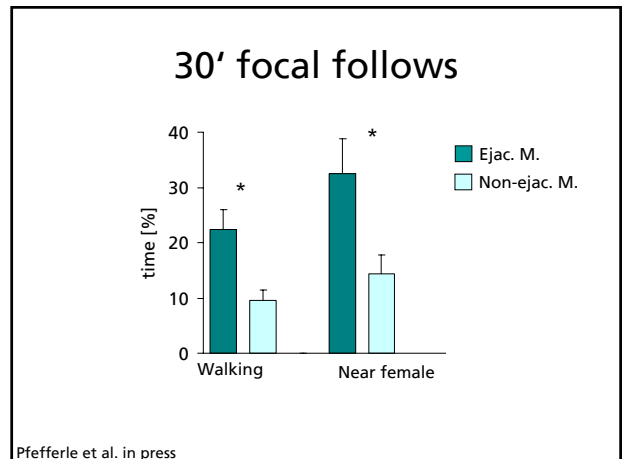
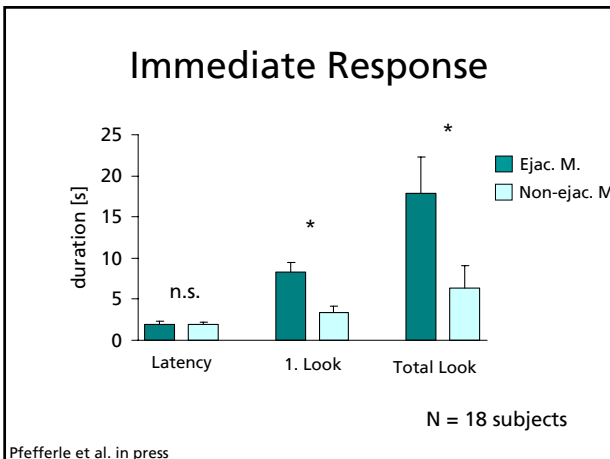
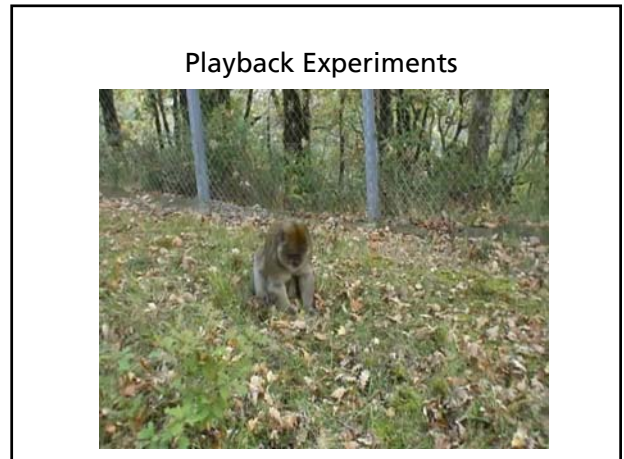
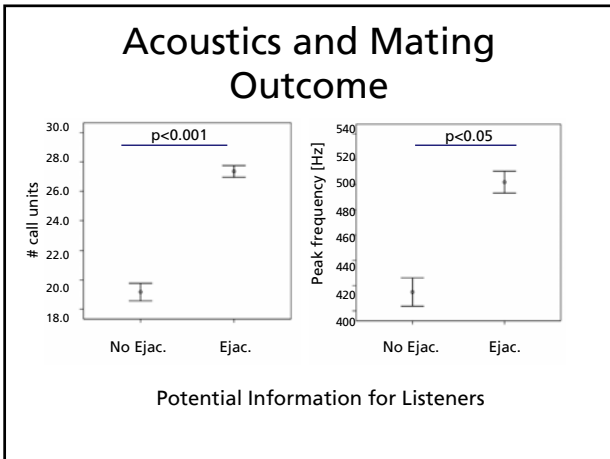
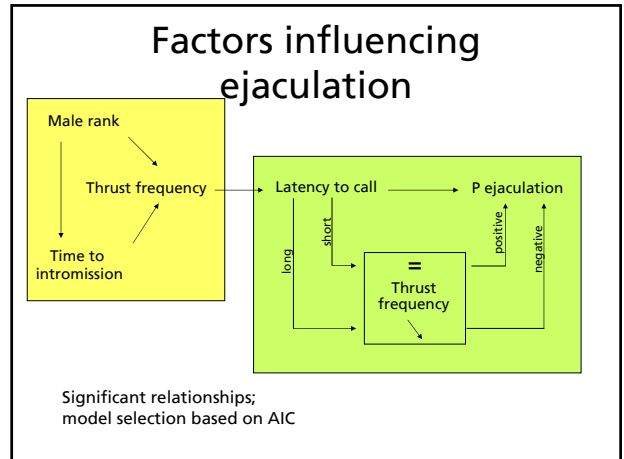
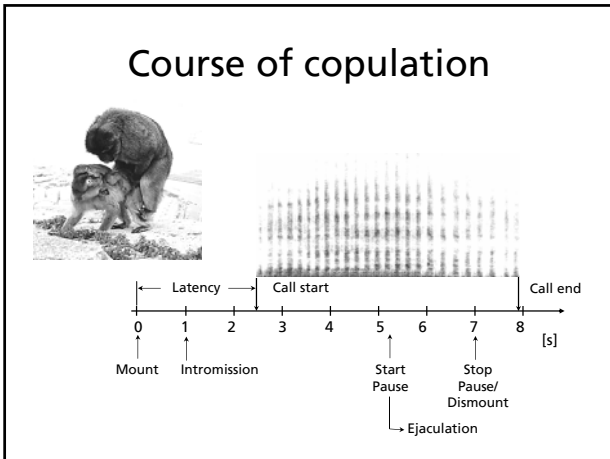


Cycle phase and acoustic structure



Does call usage influence ejaculation?





Summary

- Barbary macaque copulation calls do not reveal fertile phase but vary in relation to mating outcome
- Acoustic differences between copulation calls given during ejaculatory vs. non-ejaculatory mating salient to listeners

Functional significance

- In Barbary macaques: paternity confusion and sperm competition
- Possibly related to the extended alloparental care system



Take home message

- Reproductive strategies can only be understood with regard to the specifics of the species' mating and social system
- Different signal modalities available
 - Visual
 - Acoustic
 - Olfactory

Questions?