9.916
Mating & Parenting

Last day

Please give course feedback!

Today's Lecture

One mind thinking about another:
- stable
- universal

Social relationships:
- dynamic
- co-dependent
- context-bound

Social relationships reflect a trade-off between mutual benefit and relative benefit

Last week:
within-sex competition for resources, e.g. mates
"normal" dominance & aggression

This week:
mating & parenting

Mutual vs Relative Benefits

Mating:

Shared interests:

- survival of joint offspring

Conflicting interests:

- current vs future possible mate
- relative parental investment

Parenting:

Shared interests:

- survival of offspring

Conflicting interests:

- current vs future possible brood
- within brood competition

Selection to maximise:

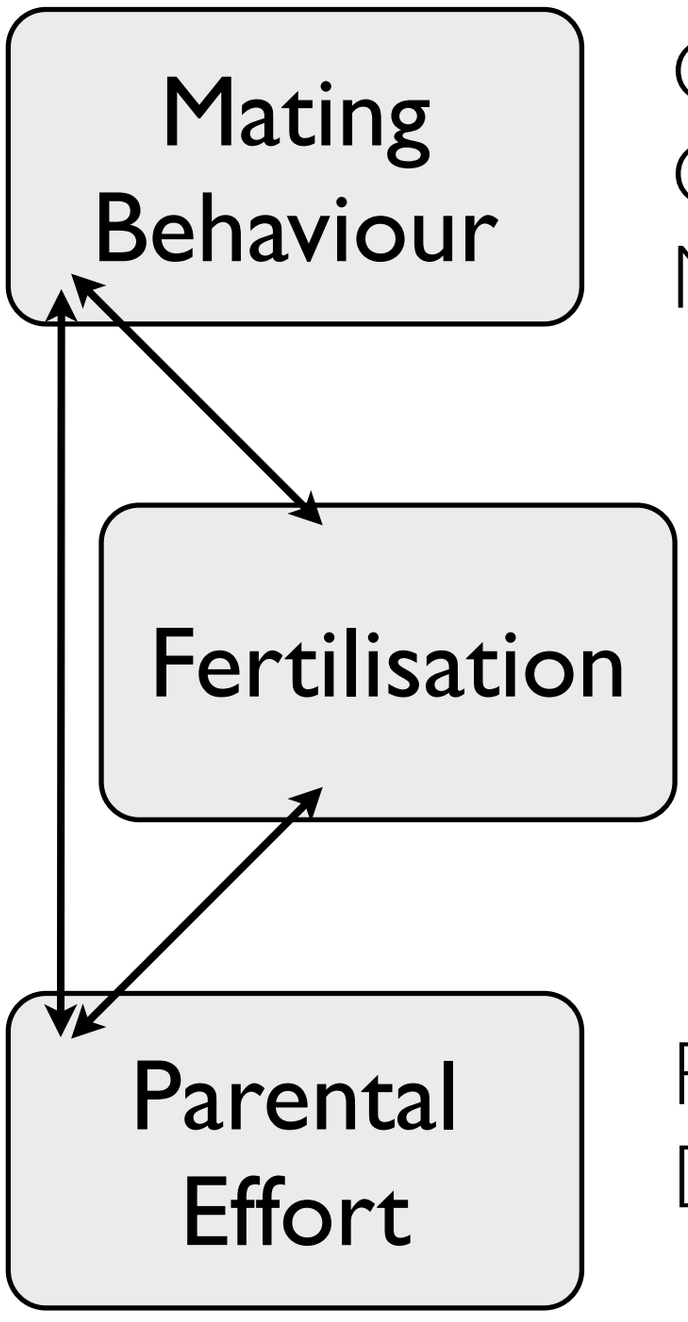
- # offspring
- chance of survival/offspring

Mate choice influences offspring survival via:

- "direct benefits" eg. parental care
- "indirect benefits" eg. genes

Mutual vs Relative Benefits

Evolution of a mating system



Competition for mates (b)
Choosiness (b)
Mating frequency (b)

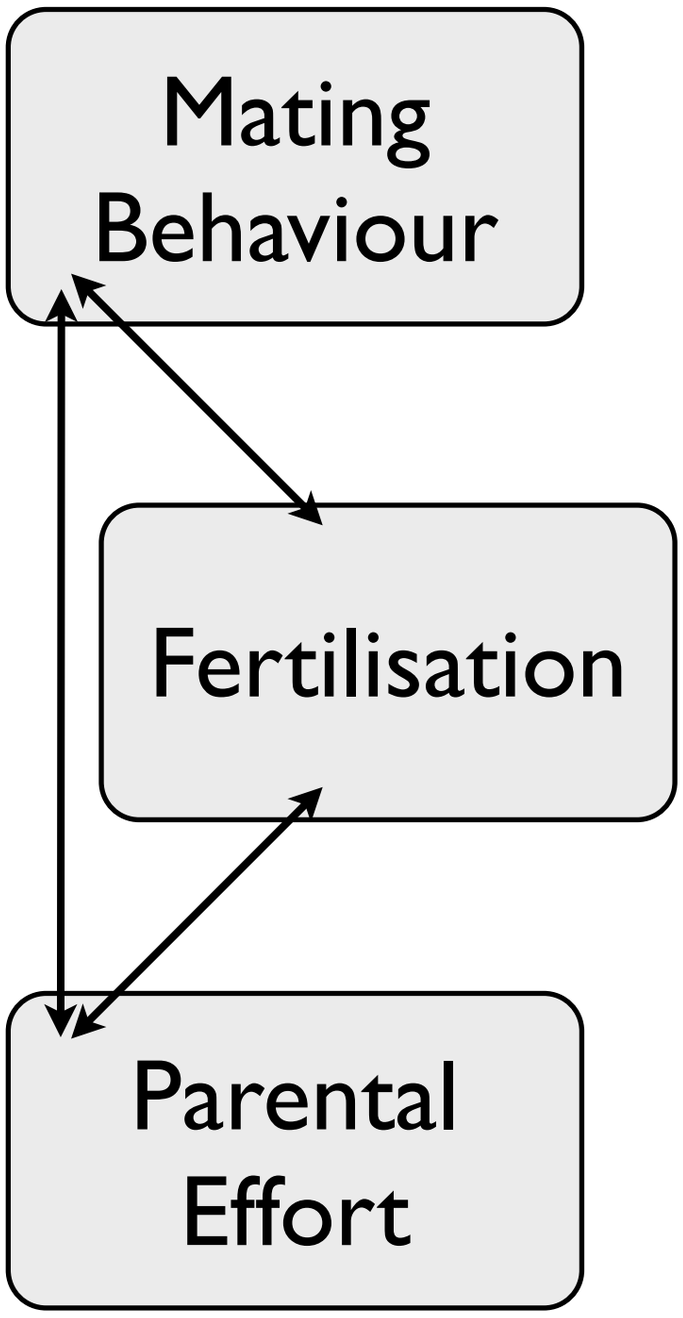
Cryptic choice (f)
Sperm competition (m)
Mate guarding (b)

Provisioning (b)
Defense (b)

Alonzo (2009)

Mutual vs Relative Benefits

Evolution of a mating system



Sperm allocation

Cognitive/neural mechanism?

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+ Competition

Pizzari et al, *Nature* (2003)

Mutual vs Relative Benefits

Mating:

Shared interests:

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Core domain of sociobiology

A role for cognitive / neural levels of analysis?

3 cognitive challenges:

(1) recognition
(2) decision
(3) search

Miller & Todd (1998)

Mutual vs Relative Benefits

Neural mechanisms

Recognition, Decision, Search

(1) Female Drosophila

domain-specific
sensory
mechanisms

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Choice?
Search?

specific receptor
SPR

Dickson et al (2008)

Mutual vs Relative Benefits

Neural mechanisms

Recognition, Decision, Search

(2) Male voles

Female choice?
Search?

Montane & Meadow: Polygamous

Prairie Monogamous

AVP receptor gene:

AVP expression:

Selection:
Few females?
Patchy resources?
Predation risk?

Figures removed due to copyright restriction.

Young & Wang (2004)

D2 antagonist

Mutual vs Relative Benefits

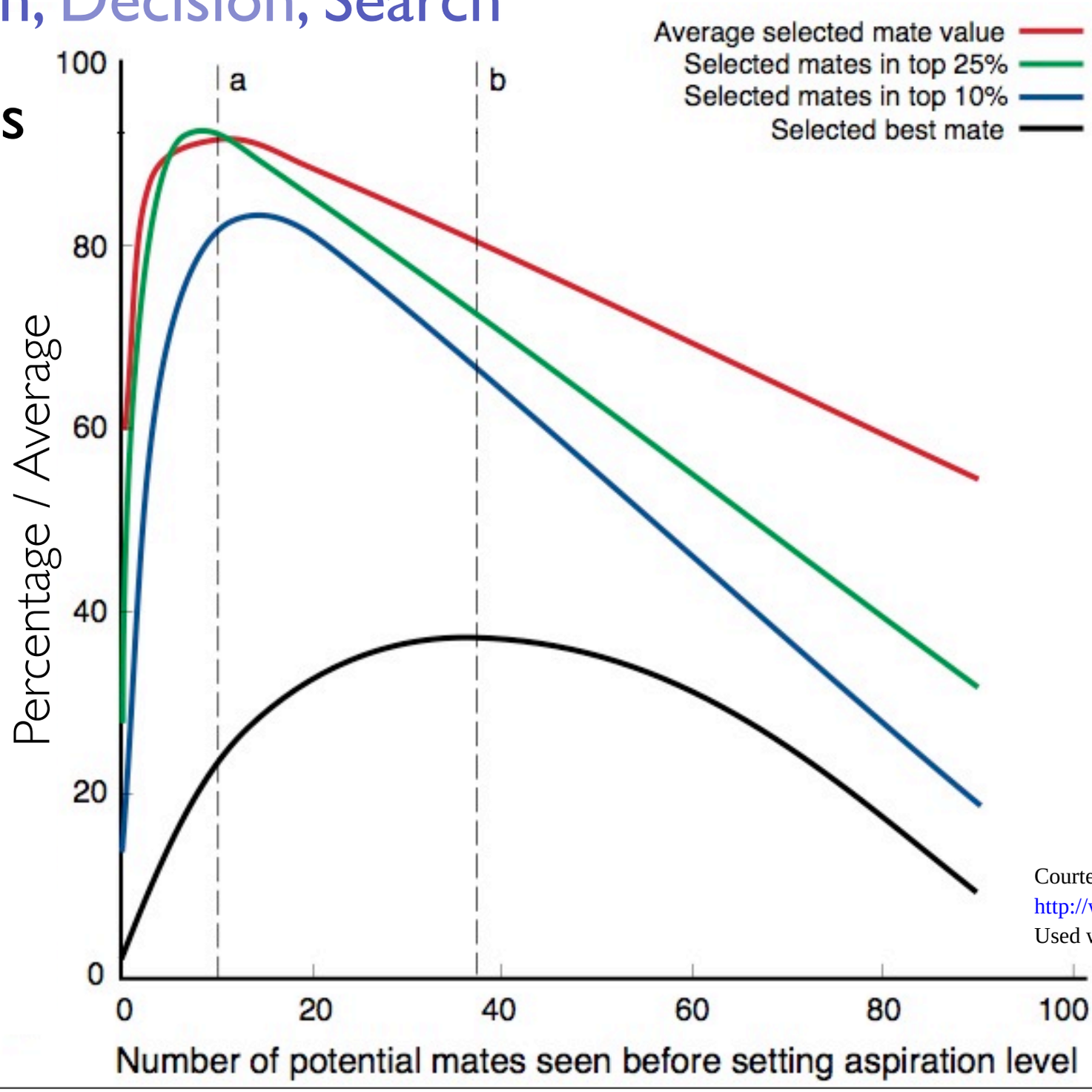
Cognitive mechanisms

Recognition, Decision, Search

(3) Humans

'Secretary problem'

Accept or reject
No returns



Missing:
Mate choice is mutual

positive assortment
~ r=.5

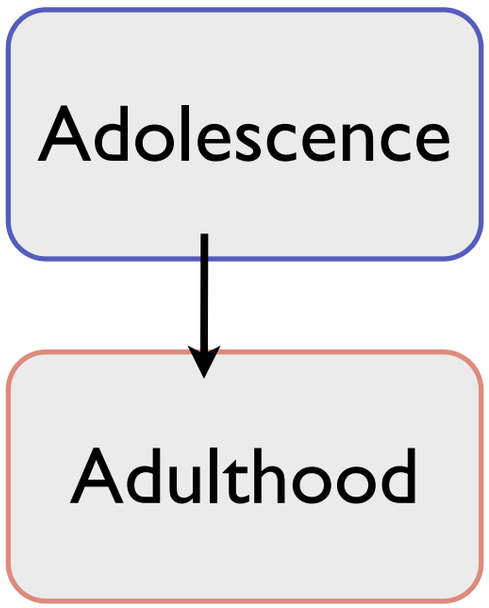
Miller & Todd (1998)
Kalick & Hamilton (1986)

Mutual vs Relative Benefits

Cognitive mechanisms

Recognition, Decision, Search

"Adjust-Relative" Model



Estimate distribution
Estimate own value
Set aspiration

Mutual choice
Stability

Empirical evidence?
Neural mechanisms?

Todd et al (2007), Beckage et al CogSci (2009)

Mutual vs Relative Benefits

Evolutionary accounts of mating: maximize offspring

Challenge: same-sex sexual behaviour

e.g. courting and/or copulating

Adaptive:

group selection: social glue	within-sex competition:

Maladaptive:

mistake:	prison:

Figures removed due to copyright restriction.

practice:	indirect benefits to hetero-zygote or opposite sex

Bailey & Zuk (2009)

Mutual vs Relative Benefits

Mati

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Shared interests:

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- within brood competition

Presentations:

How do bonds form?

- in the infant
- in the parent

Course Overview

Big challenges:

(1) Are there qualitative differences between social lives of humans & termites?

(2) What do cognitive / neural levels of analyses offer?

(3) When do multi-level analyses succeed / fail?

Altruism, Cooperation, Morality, Norms, Empathy, Helping, Action Perception, Person Perception, Theory of Mind, Communication, Teaching, Groups, Aggression, Dominance, Mating, Parenting

"When the same parameters and quantitative theory are used to analyze both termite colonies and troops of rhesus macaques, we will have a unified science of sociobiology."
E. O. Wilson

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9.916 Special Topics: Social Animals

Fall 2009