

# Sexual Selection I

A broad overview

[picture omitted for copyright reasons]

Charles Darwin with his son  
William Erasmus in 1842

[picture omitted for copyright reasons]

Emma Darwin  
in 1840

[picture omitted for copyright reasons]

A section of  
Darwin's  
"notes on  
marriage",  
1838.

# Lecture Outline

- Darwin and his addition to Natural Selection
  - Difficulties with Natural Selection
  - Definition and idea
  - Humans
- Modern Study of Sexual Selection
  - Focus on advantages to mate choice
  - Types of study

# Examples of problematic phenomena for the theory of Natural Selection

- Peacocks' tails
- Blackbird song
- Antlers in deer
- Sexual dimorphism in many species
- Mating display of Great Crested Grebe

# Examples of problematic phenomena for the theory of Natural Selection

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[pictures omitted for copyright reasons]



[frontispiece omitted for  
copyright reasons]

Darwin (1871, p256):

“We are, however, here concerned only with that kind of selection, which I have called sexual selection. This depends on the advantage which certain individuals have over other individuals of the same sex and species, in exclusive relation to reproduction.”

# ‘In relation to reproduction...’

- Being more noticed by, more attractive to, or more persuasive towards the opposite sex, and so gaining a mating advantage
  - Inter-sexual selection, ‘female’ choice
- Out-competing other members of the same sex in contests whose outcome determines mating success
  - Intra-sexual selection, ‘male’ competition

# Darwin's criteria

- Age: juvenile vs adult
- Sex: male vs female
- Season: breeding season vs year-round
- Use: specially displayed during mating?

# Why does advantage in reproduction lead to exaggeration?

- ‘Disproportionate gains’
- Our similarity to targets of propaganda

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- Showy, elaborate

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- Exciting

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# Human traits possibly related to sexual selection

- Racial differences
  - skin colour
  - hair colour and texture
- Gender differences
  - physical
  - psychological
- Analogy to fashion in clothes and personal styles

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- Bird coloration
- Anatomy of reproductive organs
- Sperm competition
- Pollen competition
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Eberhard (1985)

[picture omitted for copyright reasons]

# Population level effects...

- include polygamy, polyandry, leks and ruts
- are discussed by Alex Kacelnik in his lecture on mating systems

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# Modern study of sexual selection

- focusses mainly on preferences,
- treats preferences as adaptive,
- looks for a selective advantage to preference,
- and there are several possibilities.

# Females might choose

- **non-adaptively**: because of sensory bias, species recognition.
- **adaptively directly**: for reasons of fertilisation ability, fecundity, nutrition, parental ability, territory quality, avoiding venereal disease, social status of offspring
- **adaptively through good genes**: because of inherited attractiveness of sons, or more general 'quality'.



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## In summary,

- Darwin invented sexual selection to accommodate certain kinds of facts within his scheme, partly as a defence against non-biological theories
- He established there was female choice but said little about why
- We assume selection is at work, and want to know why there is choice