

Who Needs Sex Anyway?

- Voice Part for a Duet
- Video
 - Much of chapter 7 also covered in Video, so some review today
 - Is natural selection the only driving force of evolution?
 - Does this mean natural selection/Darwin is wrong?
 - Evolution's Rainbow
 - Sexual Selection vs. Natural Selection w/ Human Brain

Sexual Reproduction

- Sex achieves 2 main goals
 - 1. to increase population size
 - 2. to create new genetic combinations
- Found in 97% of species
- Evolutionarily costly
 - Cost of meiosis (cost of males)
 - Cost of recombination (outcrossing depression)
 - Cost of mating
 - Sexual mechanisms (flowers, pheromones, sex organs)
 - Cost of mating behavior (displays, more susceptible to enemies)
 - Injury inflicted by male
 - Disease transmission
 - Cost of escape from unwanted sexual attention
 - Remember the fiddler crab?

Parental care: who gets stuck holding the baby?

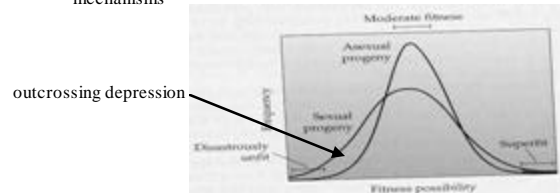
- main difference between male and female is investment in gametes
- but parenting is also expensive:
 - who abandons? the one that can't abandon first!
 - internal vs. external fertilization
- nature is not moral!!!
 - kangaroos will abandon joey if chased by predator
 - penguin will abandon one young to raise the older sibling

Asexual reproduction

- mitotic division (single-celled organisms)
- budding (corals, anemones)
- vegetative spreading (plants)
- Fission
 - paratomy
 - architomy
- parthenogenesis (some insects, minnows, lizards, and other rare cases)

Then why have sex?

- Ultimate vs. proximate reasons
- Red Queen Hypothesis (Through the Looking Glass reference)
 - pathogens very important selective force
 - sex presents pathogens with a “moving target”, making it difficult for them to evolve counter-adaptations to our defense mechanisms

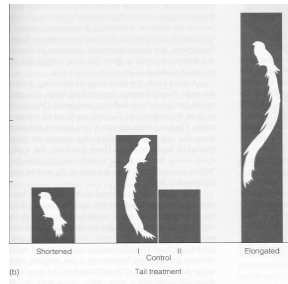


If you must reproduce sexually, who do you swap genes with?

- if you invest a lot in offspring, someone with good genes
- if you invest little, anybody you can find (sperm are cheap!)
- though sperm are cheap, obtaining matings is not!!!
 - There is often intense competition for matings
- Monogamy: single mate
- Polygyny: mating with multiple females
 - harems
 - territories
 - polygynous mating systems often have sexual dimorphisms with large males that battle over right to mate with several females
- Polyandry: mating with multiple males
 - leads to sperm competition and large testicles

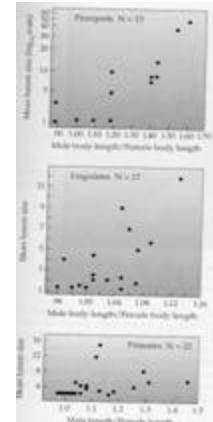
Sexual Selection

- selective pressure (can drive evolution) imparted by mate choice. Usually it is the female selecting for traits in the male because females tend to be choosier than males (once again, sperm are cheap, so males are less choosy!)

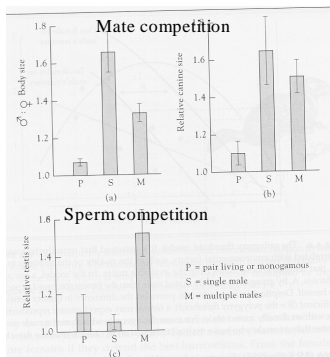


Sexual dimorphism

- sexual dimorphism: Any consistent difference between males and females beyond the basic functional portions of the sex organs.



Sexual dimorphism in primates



- humans have intermediate levels of sexual dimorphism
- human males have intermediate testicle size

What does intermediate sexual dimorphism and intermediate testicle size indicate about the evolution of human mating systems?

- it suggests that we are between chimps and gorillas in terms of polyandry and polygyny
- our harems are not as large as gorillas (human males are less promiscuous than silverbacks)
- human females are less promiscuous than female chimps
- BUT, these traits are not consistent with monogamy
- It has been suggested that sexual selection by females is responsible for
 - male penis size (the longest and thickest of any primate)
 - human brain size (video)
- What do you look for in a mate?

Are humans monogamous?

- “Voice Part for a Duet” says it depends on the culture
- Univ. of Chicago Study: when the respondents age 18-24 were asked for the number of sex partners they had had since age eighteen,
 - 8% had 0 partners
 - 32% had 1
 - 34% had 2-4 partners
 - 15% had 5-10 partners
 - 8% had 10-20
 - 3% had 21 or more partners
- Finnish study: 1992
 - Male average of 14 partners
 - Female average of 6 partners

Blue-headed wrasse mating system

- begin life as female
- harem dominated by “super-male”: large sexually dimorphic individual
- when super male dies, the dominant female switches sex
- cheater males that look like females