Female choice

In general, females are expected to be choosier than males because they have more to lose by making bad mating decisions.

Costs and Benefits:
- Possible costs to being choosy (time, predation risk)
- The benefits may vary depending upon the criteria for female choice (which relate to factors limiting female RS)

Criteria of female choice:
- Males chosen based on resources provided directly or indirectly (through territories)
- Female preference on male qualities, in absence of material gain to female
- Preexisting sensory biases
Female Choice Based On Resources

Resources provided directly--nuptial gifts

Hanging flies, scorpion flies, balloon flies
- Female fitness increases with gift size (more resources)
- Male fitness increases with gift size (longer copulation times)
- But so do his costs, especially if he is small
- Male alternative strategies:
  - False gift (spitball or empty package of prey)
  - Forced copulation

Offering yourself as a gift: mantises, etc.
- Female benefits (more resources)
- Does male benefit?
  - Does he resist being eaten?
  - Do cannibalized males fertilize more eggs? (if so, why?)
  - Would he have had a chance to mate again?
Female Choice Based On Resources

Resources provided via territory

• Male bullfrogs
  • Male defends territories
  • Territories vary in quality: warmer is better
  • Bigger males get better territories
  • Females cue on male size (through croak)

• Male bluegill sunfish
  • Male protects eggs from predators
  • Male ventilates and cleans eggs

• Birds of several species:
  • males provide care for young, AND high quality territory
  • Males with better territories get more mates (“resource defense polygyny”)
Female Choice of Traits That Don’t Provide Material Gain

Examples of traits

Stalk-eyed flies: females prefer males with long eyespan
Female Choice of Traits That Don’t Provide Material Gain

Examples of traits

Widowbirds:
- Tail length affects how many females a male can attract to his territory
- Experimental test
Female Choice of Traits That Don’t Provide Material Gain

Examples of traits
- Bowerbirds

Bowers:
- They are NOT nests
- Male provides NO paternal care
- Number of decorations correlated with likelihood of attracting mates

Satin bowerbird male building bower

Bower, decorated with blue objects

Female checking out bower
April 12: Reproduction III: Female choice in absence of material benefits

**Why Should Females Choose Traits That Don’t Provide Direct Material Gain?**

**H1: Safer to be around healthy than unhealthy males**
- Male traits indicate health (female benefits by avoiding infectious diseases)
- **Predictions:** (1) correlations between male trait and male health; (2) females that choose healthy males stay healthier

**H2: Runaway sexual selection**
- Choosing male that is attractive to females (like you) makes it likely that you will produce sons that have high mating success
- Can lead to positive feedback loop
- The process can’t go on forever: will be checked by natural selection against extreme male phenotypes
- **Prediction:** genetic correlation between male trait and female preference

**H3: Elaborate trait predicts that male has good genes**
- This works if traits are very costly, so that only very vigorous males can produce and maintain them
- Hypothesis requires that the ability to sustain such costs is dependent upon heritable traits that relate to general fitness (e.g., disease resistance)
- **Prediction:** heritable correlation between male trait and general health
Good Genes Hypotheses

Symmetry and length of tails as indicators of parasite load

In Barn Swallows:

- Males with longer tails have lower parasite loads
- They also father offspring that are more resistant to parasites
- Parasite resistance is also correlated with tail symmetry
- **Females prefer males with longer and more symmetrical tails**

Why should symmetry matter?

- Deviations from bilateral symmetry often arise when animals develop in stressful conditions
- Ability to develop normally under given level of developmental stress is a heritable trait
- Thus, symmetry is indicator of genetic quality

Why don’t short-tailed males “cheat”

- What stabilizes these traits is that they are costly, hence within reach only of most vigorous males
- Thus they are “honest” signals of male quality
Good Genes Hypotheses

Stalk-eyed flies

- X-linked “selfish gene” causes meiotic distortion: “kills off” Y-chromosomes
- Leads to tendency to overproduce females (XX) relative to males (XY)
- Leads to strong selection on females to produce male offspring (males are rarer sex, hence more valuable)
  
- Compensating gene on Y chromosome counteracts effects of selfish gene
- Females benefit if they can find males with this gene
- This gene is linked to one that controls eye stalk length
- Thus eye-stalk length is indicator of genetic quality
H4: Copy what other females do

- Guppies: females that see other females spending time near drab male will also come to prefer drab males (even if their innate preference was for brightly colored males)
- Possible benefits:
  - bright males are not always the best choice (they attract predators)
  - choices by more experienced females may indicate need to modify preferences
Preexisting Sensory Bias

If male trait is driven by preexisting sensory bias, do we need any additional explanation for selection pressures on males?

Experiment:
- glue fake sword on platyfish males
- platyfish females prefer sworded males
April 12: Reproduction III: preexisting bias

If male trait is driven by preexisting sensory bias, do we need any additional explanation for selection pressures on males?

**Preexisting Sensory Bias**

- **YES!** Preexisting bias accounts for historical origin, not current function
  - female preference may impose cost on her
  - male trait may be costly
  - need to consider benefits
Preexisting Sensory Bias: Tungara Frogs

In some species, male call ends with a loud “chuck”

In species that lacks “chuck”, females prefer calls that have the “chuck” added

Implies preference for “chuck” was present prior to evolution of “chuck” itself
April 12: Reproduction III: preexisting bias

Human Mate Preferences