

Bio 45 – Lect. II-12- Mate Choice

I. Criteria for Choice of Mates

- A. Immediate gains to chooser (or to chooser's offspring) - mate quality judged directly
- access to resources needed for reproduction
 - food given during courtship ("nuptial gifts")
 - protection (from predators or other potential mates)
 - help with parental care (good parent theory in Alcock)
 - lack of sexually transmitted disease (= Alcock's "healthy mate theory")
 - greater number of gametes to fertilize (e.g., male choice of more fecund female)
 - reduction of mating costs (= no gain, just lower cost)
 - greater chances of offspring success due to juvenile conditions
- B. Indirect, longer term gains in offspring quality - mate quality judged indirectly
- **runaway** selection (= Alcock's "runaway selection theory")
 - **good genes** selection (= Alcock's "good genes selection" and "Healthy mate theory")

II. When Should Female Choose Among Males?

- A. As originally defined, female choice results in changes in male secondary sexual characters -- that can only happen if males differ genetically. Note that this strict definition excludes some adaptive mating choices by females!
- B. **Generally** what females gain from choosing among males is access to resources, protection (from predators or other males), or assistance in parental care. However, female choice theory has largely focused on those rarer cases where females get only sperm from males. We will look at those in the next lecture and an example in section

III. What Needs to be Shown to Demonstrate Mate Choice

- A. Choosers must have the chance to choose - see or interact with two or more potential mates*
* an exception is template matching - female mates with first individual that fits template
- B. Chosen sex must vary with respect to trait and choices must be made using the trait.
- C. Choices must increase reproductive success of chooser relative to other choices or no choice.
- D. Must rule out possibility that within sex competition determines who mates with whom
- more than semantic problem -- mate choice and intrasexual competition interact. For example, potential choices might be limited by exclusion of competitors from mating area.

IV. Some Approaches to Studying Mate Choice -- see Alcock pp. 341- 358

- A. You should classify the approaches used to demonstrate mate choice and test among the various models and criteria. Pick particularly good examples and look for re-occurring methodologies.
- B. Note that these will often be experiments like those used to directly test adaptation hypotheses -- you can review that material as well.
- For example, the tail length modification studies by Malte Andersson with widowbirds and Anders Møller with barn swallows.

V. Is mate choice all about the traits and behaviors of the chosen ones?

- A. Note that both intra-sexual competition and mate choice are, in the context of sexual selection theory, about the evolution of traits in one sex driven by their success at competing for reproductive opportunities with the opposite sex. In general, then, sexual selection is all about male traits. What about the evolution of female behavior?
- B. Alcock does discuss the issue of male-female conflict relative to mate choice and sexual selection in general -- pp 341-343, 353-355. Be sure you get both the "sexual selection" perspective and the "female reproductive decision" perspective on mate choice.