Dr. Susan Raylman

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Evacuation
Exit building from either of the two main doors
Move away from the building while avoiding parking lots
Do not congregate near building or parking lots

Proximate vs. Ultimate
Observe:
Bird removes eggshells from nest

Proximate Hypotheses about sensory physiology, what stimulus induces the behavior – Causal explanations of behavior ➜ How? questions

Ultimate Hypotheses about adaptive significance ➜ Why? questions
Niko Tinbergen - formulated 4 categories of questions when considering animal behavior:

1. Causation
What is the mechanism that causes a behavior?
- Considering stimuli, sensation, perception, physiology
Ex: hormone levels in a ram, neural connections in a fly

2. Development (ontogeny)
How does the behavior develop? Development of behavior is the result of interaction of genes and environment.
Ex: A songbird learning to sing its specific song

3. Evolution
How did the behavior evolve through time?
- Combine phylogeny with behavior data
Ex: evolution of dance communication in bees
Natural Selection

Given:
- Variation in traits exists among individuals of a population
- This variation is associated with differing ‘fitness’
- This variation is heritable

Then: With time traits associated with higher fitness become more prevalent in the population

4. Function

- Why does the animal do this behavior? How does the behavior improve the fitness of the animal?

Given:
- Evolution of echolocation in swiftlets

Ex: Why do some ground squirrels live in groups while gray squirrels do not?

Whose fitness do we consider when determining the function of a behavior?

Is a behavior used to *further the species*?

Ex: Lion movie
Lion infanticide

- Male committing infanticide

Prides: 3-12 adult females and their cubs
Coalitions: 2-6 males

When females are nursing, they do not have estrus

What causes infanticide? vs. What is the function?

Look at ecology...

Infanticide at first seems counterintuitive, but it can be explained through natural selection

Langurs also have infanticide and same social ecology as lions

To determine the function, consider how a behavior helps the ‘fitness’ of an individual

“Good for the species” is incorrect...even with helpful behavior

Ground squirrel calling in presence of predator

Reminder

Using the word “species”

- Species – subdivision of genus; a collection of individuals that resemble one another and can interbreed
- Sometimes students use the word species when they really should use ‘individual’