Lab #8: Animal Behavior Pages C55-C59

Key words and concepts from introduction

This lab builds on the concept of sensory reception (receiving stimuli) and motor response (responding to the stimuli) we discussed in the nervous system lab.

Behavior = any animal's response to a stimuli or set of stimuli. Behaviors can be simple (move away from light) or complex (a mating ritual). Examples of stimuli include a change in climate (heat, dark, rain), the presence of another animal, a smell (food? another animal?), a sound…. there is an infinite variety of stimuli that animals might respond to!

Innate Behavior Behavior that is genetically determined… animals are born with innate behaviors and thus can engage in them from day one, or innate behaviors are triggered by hormones (i.e. puberty). Instincts fall under the innate category. Examples of innate behaviors include:
1. reflexes (pulling hand from hot burner)
2. eat food when hungry, hunt or graze
3. make sounds

There are *many many* examples of innate behavior: things you do without ever having to be told how to do it or witnessing someone else doing it.

Learned Behavior Behavior that is the product of experience: good examples would be a behavior that is acquired through trial and error or that is acquired by watching others. Examples include:
1. not touching a hot burner
2. using a tool to help you hunt (i.e. chimps or birds can teach each other to use twigs to catch ants); avoiding plants that will make you sick, octopus opening jar with food in it after observing people do it
3. using a language (English versus French); baby birds learn courtship and territorial songs by listening to adults

Innate and learned behaviors are often intertwined. Kittens know how to eat and will catch things to eat without instruction (*innate behavior*), but kittens also learn particular hunting techniques from their mother that will make them more successful… or they may discover a new hunting technique that is successful and will then continue to use it (*learned behavior*).

The examples above should illustrate how difficult it can be to tease apart the role of *nature* (genes, innate behavior) and *nurture* (experience, learned behavior) in the behavior of people and other animals. It is probably obvious that there is variation among individuals based on different experiences (learned behavior) but there is also variation among individuals based on genetics (innate behavior). Am I a shy person because of my genes or because of my experiences? Perhaps both!

Examples of ubiquitous (commonplace) behaviors in animals
Courtship, aggression, submission (we will observe all three in class)

Agonistic behavior may be innate or learned: Agonistic behaviors are any behaviors that are threatening (aggression) or that are ways to avoid threats (submission or running away). Basically, agonistic behaviors occur when the question is asked" "Who is the boss?" These kinds of behaviors are like two sides to the same coin, and you cannot have one without the other (see territoriality discussion below).

Aggression→ behaviors that communicate dominance. ("I am the boss!")
Examples are often similar in many species… think about how people, dogs, crickets and fish do the following when they are being threatening:

- Make self look big and imposing
- Orient head-to-head with adversary, direct eye contact
- Make loud noises

Submission→ behaviors that communicate subordinance ("OK, you're the boss!").
These behaviors are designed to demonstrate that you are NOT a threat… again, people, dogs, crickets and fish all do the following:

- Make self small (crouching, laying down, lowering head)
- Orient to the side, avoid eye contact
- Stay very quiet

Territoriality Animals will engage in aggressive behavior when they are defending a territory. Territories are areas where an animal makes use of resources: breeding, food, water, shelter, nesting materials, etc. Animals squabble over these resources and try to establish ownership because without resources animals will die. However, being able to indicate that you are submitting to the dominance of another animal is critical… in every fight, someone must back down. Otherwise, fights might end in mortal injuries for both parties and neither would survive to reproduce. Knowing when to back down means you survive another day to potentially reproduce: fighting to the death or until you are injured is NEVER an advantage because it reduces your reproductive capacity!

You should learn to recognize:

Males vs. females: ovipositer is on female. Both males and females have cerci.
stridulation (know all three types!): notice that only the male stridulates. Stridulation is made by rubbing the scraper (one pointy bump) of one wing across the file (long bumpy vein) of the other wing. (This is like a guitar pick strumming strings). Would you expect females have a file and scraper?
antennation, grooming, examples of submissive behaviors, examples of aggressive behaviors, cerci,
ovipositor structure that the female cricket uses to lay eggs under the soil
tympanic membrane: a membrane on each foreleg that allows the cricket to hear noises (it works like an eardrum). Consider the three kinds of stridulation and what each kind is communicating …. now: do you expect that both males and females have tympanic membranes, or does just one gender have tympanic membranes?

You should learn to interpret a data sheet of behavior observations. Tally up observations that indicate: relaxation, aggression, submission, courtship. Your crickets may have shown repeated confrontations or just one.

Answer questions pages C57-C59!!!!!!