Animal behavior observation

BACKGROUND INFORMATION:
METHODS FOR ANIMAL BEHAVIOR OBSERVATIONS

Behaviors can be generally classified as events or states. Events are short duration actions (jumping into the water, flying to a new perch, scratching an ear, charging a rival, eating a berry). States are longer duration activities (sleeping, foraging, sitting next to another individual). Both events and states can be recorded as counts (how many times a behavior occurs) or frequencies (how often a behavior occurs over a given period of time). States also have a time component that can be recorded as start and stop time or duration.

DESCRIBING A BEHAVIOR:
The two main ways that behaviors are described are in terms of structure or consequences.

Structure: What does the behavior look (or sound, or smell) like? How is the animal positioned and what motions is it going through? If you had built a robot version of the animal, what instructions would be necessary for it to execute the behavioral movements?

Drawbacks: can be time consuming and require discrimination of subtle differences in movement Advantage: unbiased about function

Consequences: What effect does the behavior have? This can include effects on the animal subject, another animal, or the environment. Some examples of describing a behavior in terms of consequences are “feeding”, “a threat display”, or “collecting nectar”

Drawbacks: interpretation of behavior can be wrong, especially if assumptions about the behavior lead to use of non-neutral terms.

Advantages: concise, easy to record

“For example, ‘turn on light’ is a description in terms of consequences, while ‘press switch down using index finger’ is a structural description.” (Martin and Bateson p. 57)

A third way that behavior is sometimes described is according to spatial relation: Where or with whom is subject behaving? Rather than be concerned with what the animal is doing, the focus is on the environment, orientation or social context.

ETHOGRAM:
An ethogram is a description of the main types of behaviors for a given species. It breaks behavior down into categories and provides a description for each category. This is useful both for understanding the behavioral repertoire of a species and for making recording behaviors easier. Since an animal’s behavior is naturally a continuous flow from one event or state to another, breaking it down into categories allows a researcher to make measurements and comparisons.
An ethogram for my cat might be as follows:
Sleep: lying down with eyes closed
Grooming: licking body or licking paws and wiping head
Resting: lying down with eyes open
Begging: circling or contacting human legs while meowing
Eating: ingesting food
Vocal Threat: hiss or growl when other animal is within one bodylength
Clawing: stretching while extending claws into furniture or carpet
Paw swipe: fast movement of paw toward other individual
Using litterbox: you’d have to stick your head in there for a good description

An example of a much more thorough ethogram can be found here.
http://pin.primate.wisc.edu/callicam/ethogram.html

**SAMPLING METHODS:**
In many situations it would be impractical, if not impossible, and not terribly helpful to record every aspect of an animal’s behavior at every moment. Therefore researchers sample behavior by making observations according to a pre-established plan.

**Ad libitum sampling:** this is pretty much writing everything down that you can. It is often used for field notes and preliminary observations. It’s hard to keep track of everything though, so observations are apt to be biased toward more obvious behaviors. Also these sorts of data can be hard to quantify, and converting observations to numbers is essential for most scientific analysis.

**Focal animal sampling:** the observer focuses on one individual and records that animal’s behavior. Often a set of behavioral possibilities (an ethogram) would be established ahead of time.

**All occurrence sampling:** the observer focuses on a particular behavior and records when or how often it occurs. For example, a researcher could record how many times songbirds mobbing a hawk swoop toward the hawk, or perhaps how many times coyotes howl between 11 p.m. and 2 a.m..

**Scan sampling:** the observer checks what is going on at fixed intervals. It is a method best suited for recording behavioral states, since events are likely to be missed. The shorter the scan interval, the more informative the data will be. It is a good method for collecting data on groups of animals. For example, a researcher could scan a herd of deer at 30 second intervals and note how many were grazing with heads down, how many had their heads up looking around, and how many were lying down.

**ANIMAL OBSERVATION ASSIGNMENT**

**OVERVIEW:**
You will pick an animal to observe, take notes on its behavior, and then come up with a question about that animal’s behavior and a hypothesis and prediction that would help you answer the question.

**GOALS OF THIS ASSIGNMENT:**
1. Familiarize you with some animal behavior research observation techniques.
2. Give you a sense of what scientific observation of behavior entails.
3. Give you a chance to notice and appreciate aspects of an animal that you might miss as a casual observer.
4. Practice applying the scientific method.

INSTRUCTIONS FOR OBSERVATIONS:
Observe the animal (or animals) and take notes on its behavior for at least 20 minutes. If you choose an organism that has long behavioral state durations or an individual that just isn’t doing anything interesting (for example, if none of the pigeons on the telephone wire have moved in 15 minutes), then you should observe for longer, observe at a different time, or choose a different organism to observe. It is expected that you will make a reasonable effort to complete this task.

Make your notes as detailed as possible. Don’t just watch the animal, but really observe it. Pretend you are trying to give a play-by-play of the action to a blind person. “Bird sits on branch and sings” tells you the main points, but misses a lot of detail. “Bird fluffs wings, hops, sings song, sings another song, sounds different—more trilly—flies to smaller tree (willow?), flies back to different branch in first tree…..” gives a more complete picture. You aren’t trying to analyze the behavior at this point, just give a full description of what the animal is doing. Don’t worry about making your notes neat, as long as you can read them. Use drawings if they are helpful in recording the setting, the animal’s movement, or what a particular behavior looks like.

Exactly what you record will, of course, depend upon the animal you choose and how it is behaving. Try to note the times of behavioral events or changes in behavioral state (for example, “11:21 gets up”). If you are able to identify certain behaviors and want to quantify them, you can create a space in your notes to keep counts of how often each behavior occurs in a certain time period. For example, you could count how many ants emerge from the ground over 10 minutes, or how often a hummingbird comes to a feeder. In cases like the latter, you could set up a column for the behavior and note the time of each occurrence when it happens. Behavioral counts are not required for the assignment, but can be used to make your note taking easier, since it can be hard to watch and write at the same time. However, please don’t forego descriptions and turn in just a bunch of tick marks or columns of times. You will not get full credit for such abbreviated observations.

Your notes should include:
1. Date and time
2. Location where you observed animal
3. Habitat in which you found the animal (a field of grass, dense shrubbery, rocky intertidal zone, mowed lawn, etc.),
5. Description of animal including common and scientific names if known
6. Description of animal’s social environment (Alone? With another individual? In a large flock?)
7. Your behavioral observations

You will most likely use ad libitum sampling for this assignment, since you are making preliminary observations. In most cases it will make sense to choose a single focal animal to observe.

Avoid anthropomorphisms and over interpretation of what you observe. For example, don’t use words that imply you know the emotional state of the animal such as “angry” or “happy.” Don’t feel that you need to understand what is going on. Your job for the moment is just to record it as best you can.
Include in the report you turn in:
1. Description of the animal(s) you are observing. In addition to a good description, provide the common name and/or scientific name if possible. Field guides can come in useful here.

2. Where and when did you observe the animal?

3. Describe any problems or challenges you had in observing the animal.

4. Come up with an ethogram describing at least three behaviors you observed for the animal. The ethogram should include neutral (not conveying emotional state or making assumptions about function) labels for each behavior and a brief description such that someone else could identify the behavior if they saw it.

5. Come up with a question about the animal’s behavior. Base your question on your observations along with what you know about animal behavior. I encourage you to do some research into the animal’s natural history if that will help you understand it better and come up with a more interesting question.

6. Come up with a well thought out hypothesis to answer your question. You are not expected to be an expert on the species, so your hypothesis does not have to be the “right” answer, but do make it consistent with what you have observed and any basic facts about the animal’s biology you know.

7. Come up with a prediction from your hypothesis that you could use to test the hypothesis.

8. Attach the raw notes from your observations at the end.

This assignment will be worth 10% of your final grade (one third of the 30% based on homework assignments)
CHOOSING AN ANIMAL TO OBSERVE:

Since one goal of this exercise is to observe an animal behaving, you want to pick an animal or animals that you can actually see, and you want to pick an animal that is doing something more than just lying around.

Take some time to consider your options. While you can’t control what will happen while you are observing animals, you should make a reasonable attempt to achieve your observation goals.

Before you start recording your observations, take a minute or two to assess the situation. Are you likely going to be able to identify and follow one individual for the full twenty minutes? If the animal is currently inactive, is there a different time of day when you might be more likely to see activity? Does it make sense to do all observation in one block of time or to break your observation into shorter time periods spread over an hour or two or even at different times of day?

Ideas for animal observations:
Wildlife that is already habituated to humans (deer in local parks such as Fremont Older; squirrels).
Happy Hollow Zoo (http://www.happyhollowparkandzoo.org/)
Wildlife underfoot (ants, snails, slugs, butterflies, other insects)
Monterey Bay Aquarium
Dog parks
Birds (including birds at feeders)
Ducks in local parks (Memorial Park in Cupertino)
Shorebirds at coast
Lizards
Pacific tree frogs (the only frogs that actually say “ribbit” are plentiful around our local streams)
Certain pets such as aquarium fish, reptiles, rodents

Animal subjects to avoid:
Your pet dog or cat.

Observations of a household pet, while easy to come by, may have several problems. These include behaviors being so specific to the particular household or to domesticated life as to be evolutionarily uninteresting (Think of the limited scope of hypotheses about why cats come running when they hear a can of cat food being opened.), the difficulty of being an unbiased observer who doesn’t interact with the subject, and the limited range of behaviors a short observation of a domestic dog or cat is likely to reveal (Sleeping isn’t that interesting, and you can’t just let your dog run loose in the neighborhood and secretly trail her).