

BIO 45 - Journal #3 - Interactions & Communication - 2002
Due Monday, 28 October - at class

All interactions among animals involve the production, exchange, and use of information. This can be passive (e.g., odor of a prey allows a predator to find it) or active (e.g., chirp of a cricket attracts a mate). You can see that this covers an enormous range of behavior. The rest of the course deals with the evolution of communication within species in various contexts: aggression, reproductive competition, mate choice, and social behavior. You need to get a grasp on how to observe and study communication. You will focus on the two questions from discussion section:

How can we tell when two animals are communicating?

How should communication be designed by selection?

Consider the sensory systems of the animals you are watching. You are largely an acoustic and visual animal, many animals are communicating using chemical signals or visual or acoustic ones beyond the range of your sensory systems. Watch accessible animals like birds, squirrels, cats and dogs who share parts of your visual and acoustic world. Remember that dogs, cats and squirrels means of communication may also have a strong olfactory side to them.

ASSIGNMENT (Mark specific things from each part for us to read):

Continue your general observations of animals. Pick situations where interactions are likely to occur. Good animals for this exercise are pigeons and ducks. Pigeons are great subjects -- you can recognize individuals – there are lots of them at Kennedy Plaza. Ducks can be found at Roger Williams Park – avoid trying observations where people are feeding them. Note that much of communication involves posture and body position and evidence of interaction may involve subtle changes in direction of movement or displacement of one individual by another without any direct confrontation (e.g., chasing or fighting). It is not easy to see.

Now that you are good at finding animals and getting at details, you should begin to use your accumulating base of observations for increasing the number and kind of questions you ask. Look for repeated patterns of behavior, subtleties you missed before and the actions of the same individual in different contexts. Vary the places or times of day you watch. Look for behavior or contexts that overlap with topics covered in the lecture or readings. Ask questions, think up answers, design experiments (even if you cannot do them).

For this assignment we expect a minimum of 3 hours of observation and 1 hour of brainstorming. Note that we expect you to be recording 3 hours of interactions, not 3 hours waiting for something to happen. These are difficult observations to do, so plan ahead and make sure you complete the assignment. Help us identify where the assignment begins.

Part 1 – observations: You are recording interactions between members of the same species. Try to identify ways to tell when communication has occurred. For example, if an animal only does X when another does Y you may have the clue that Y is the signal that elicits X. Look for behaviors (displays, vocalizations, postural changes) that signal or predict an interaction and the behavior involved. Find the details of pigeon-speak that predict a chase or of dog-speak that herald a friendly interaction. Find the signals that tell you which dog or pigeon will be submissive or displaced.

You may have to watch a while – not part of the total 3 hours of observation -- until you begin to see evidence for interactions and the possible signals or displays. If it helps you, work with a partner. Once you get the insights you need, try to quantify your observations. **Make sure to mark one particularly good set of observations and analyses about communication.**

Part 2 – brainstorming: Think about the evolution of communication as you watch animals. You've covered this in section and it has been discussed in lecture and in Alcock. Now it is your turn. **Brainstorm for 1/2 to 3/4 of an hour in your journal. Then summarize your ideas in a page or so for us to read. Remember these are your ideas not a re-hash of what you have read. Work your own observations in.** What are your feelings about the design of communication systems? What issues emerge as you think about how such systems ought to work for the benefit of the animals communicating? What problems are most likely to arise and have to be overcome as a communication system evolves? How would evolution design animals that are optimal in their interactions with others of their own species? The brainstorm is your ideas in relation to your observations. not a paraphrase of what you read in the text or heard in lecture.