Alcock Ch. 9 -- "Communication" Study Questions
Ethology and Behavioral Ecology

General: This chapter is rich with examples. In a sense, it is also rich in theory although the discussion of theory is not nearly as explicit as that which will be presented in class. Perhaps its greatest contribution to your knowledge will come from gaining a better understanding of the ways that the process of evolution of complex traits proceeds. It is important that you know some of the examples in this chapter and that you can apply them to the theory we will learn in class. In the questions below, I will try to get you to focus on some of what I consider to be the more interesting examples.

1. In regards to the entire chapter, think about the concepts of cumulative change and current (vs. previous) adaptive value. Alcock looks at these concepts in a number of places; we have invoked them previously in the course in some of our discussions of cognitive ethology.
2. The evolution of the structure and use of the pseudopenis in spotted hyena females is an excellent example of hypothesis testing – and of an intellectual process that is most likely not yet settled. Read the multi-page example primarily in terms of how we try to solve evolutionary hypotheses and how, increasingly, research on proximate mechanisms at least informs tests of evolutionary hypotheses.
3. Be familiar with the attempt to reconstruct the evolution of hearing in moths -- relate what you learn here to our earlier consideration of noctuids and to the idea of the production of novelty via mutation and natural selection (also think about hearing in regard to question #1 above). Incidentally, on the genetic level, where is it likely that most the evolution that results in the production of a hearing organ from mechanosensory receptors, skeleton and respiratory system comes? -- Is it primarily at the structural or regulatory genetic level? Explain your answer.
4. Note the take on the evolution of insect wings that Alcock provides. Please be familiar with this example and also be aware that this is far from a settled question. It in fact remains a great mystery and there are many ideas about it. But once again, note how the concepts in question #1 are invoked.
5. What is sensory exploitation? Sensory preference? What do they have to do with the evolution of signaling? Know several of the examples given in the text – especially those that involve direct manipulations of signals. How does one uncover a sensory bias (preference)? How can a preference for a signal or stimulus in one context eventually result in a signal with a different meaning? In this regard, you will notice in class that I will discuss the evolution of signals in terms of their being "Fisherian" (the signals provide little information about the signaler's quality) and "Zahavian" (signals evolved because they are reliable indicators of quality).
6. Please be sure you understand the phylogenies presented throughout the chapter and their usefulness in understanding behavior. What is meant by parsimony in regard to a phylogeny? -- You may need to actually look this up on your own.
7. Use Gould's "Panda Principle" to explain the evolution of sexual behavior in parthenogenic lizards.
8. Be familiar with the details of how Heinrich was able to successfully explain (for the moment at least) the "yelling" call of ravens.
9. What are <u>illegitimate receivers</u>? Contrast illegitimate receivers with the idea of "<u>dishonest</u>" communication. Make this differentiation in part on the effects on the sender and receiver. Know several examples of each -- be certain that one of the examples is the *Photuris / Photinus* example and that another has to do with the evolution of begging calls. Know the main hypotheses for accounting for the evolution of dishonest signals. We will consider all of these topics in some theoretical depth in class; it will be helpful if you can connect much of the theory in class to the examples in the text (we will spend far less time on these because they are well covered by Alcock).

Please look over the questions sprinkled throughout the chapter.