

## A study guide for the first mid-term in Animal Behavior

For the first exam you should be familiar and understand material covered in lectures 1 – 7, as well as the assigned readings. These are an important source of examples that may be used to support arguments or provide examples. Also be sure to do the additional assigned readings (chapters 3 and 4 in Principles of Animal Behavior... on reserve in the library and the chapter on signal honesty... available as a pdf from the lecture schedule – Lecture 6). You are expected to have watched the DVD “Dogs Decoded” and be prepared to discuss or use the examples given in light of course concepts.

You should be familiar with the Selfish Gene, both in the broader context of how selection operates at the gene level and in terms of specific ideas regarding the evolution of behaviors. This is also a good source of examples.

You should have a working understanding of the concepts and ideas introduced during lecture (along with relevant examples). This should include the ability to:

Provide a working definition of behavior

Describe and discriminate between asking proximate vs. ultimate questions about behavior

Describe the basic features of the scientific method and the use of science to understand the natural world, including the basic approaches used to study behavior (comparative, experimental, theoretical) and their relative strengths and weaknesses.

Describe the link between behavior and evolution (including how natural selection and behavior relate to fitness (the big three!)) and be able to cite several lines of evidence that reveal a genetic or hereditary component to behavior.

Be able to explain the relationship between genes and behaviors, given that genes simply make proteins

Know the 4 basic factors that contribute to the adaptiveness of behaviors:

- 1) Detect environmental conditions (both physical and biological) that influence fitness.
- 2) Process information about the environment and have a "program" for responding.
- 3) Perform appropriate behaviors, as dictated by the "program"
- 4) Do all of these things quickly.

Know and describe forms of environmental sources of energy in the context of behavior (radiant, chemical, mechanical, electrical) and understand the following terms and how they relate to behavior:

Neuronal network:

Receptor cells

Sensory inter-neurons

Central Nervous System and Brain (or neural processing center)

Motor inter-neurons

Know what hormones do, in general, and the three basic categories of hormones as they relate to behavior (what they do, how they differ, and examples).

Understand sensory or neuronal “filtering” and how examples of filtering help us understand the proximate causes of behavior and how “appropriate” behaviors can emerge from an environment filled with stimuli.

Understanding why the basic way that signals can be organized and processed within neuronal networks (including the brain) provides insight into the production of complex behaviors via feedback and changes to internal physiological state.

Know the difference between "Innate" vs. "Learned" behaviors in theory and in practice and demonstrate an understanding of the usefulness and limitation of "nature" vs. "nurture" arguments.

In the context of "innate" behaviors, know the following terms and how they relate to our understanding of the expression of behavior: Sign Stimuli; Releaser, Fixed Action Patterns (FAP)

Understand the following concepts/types of "learned" behaviors and examples of each

Non-associative learning

Habituation:

Dishabituation or sensitization.

Associative learning:

Classical conditioning

Operant Conditioning

Be familiar with the role that environmental predictability likely plays in the evolution of "instinctual" vs "learned" behaviors

Know what distinguishes a behaviorist's definition of communication from more generally used definitions

Displays: what are they?

Behavioral vs structural displays: What are they, what forms might they take (general categories and specific examples).

Constraints and signal evolution in the context of animal communication:

Modes of communication (i.e., sensory modalities) and constraints that can act upon them (ecological, physiological, social).

The significance of "honest" and "deceitful" communication and the "ultimate" study of communication

Under what types of conditions might we expect honest signaling

Forms of dishonest signaling: lies, bluffs, not passing along information, attenuators

Why receivers may demand honest signals from senders and the role of handicaps.

Above all, you should be prepared to use the various ideas and terms that have been introduced thus far to connect various topics to provide a better understanding of "how" animals behave. It is assumed that you already have a strong grasp of the basic concepts of natural selection and trait evolution. If you have any questions about the topics outlined in this study guide, please don't hesitate to contact your instructor!!