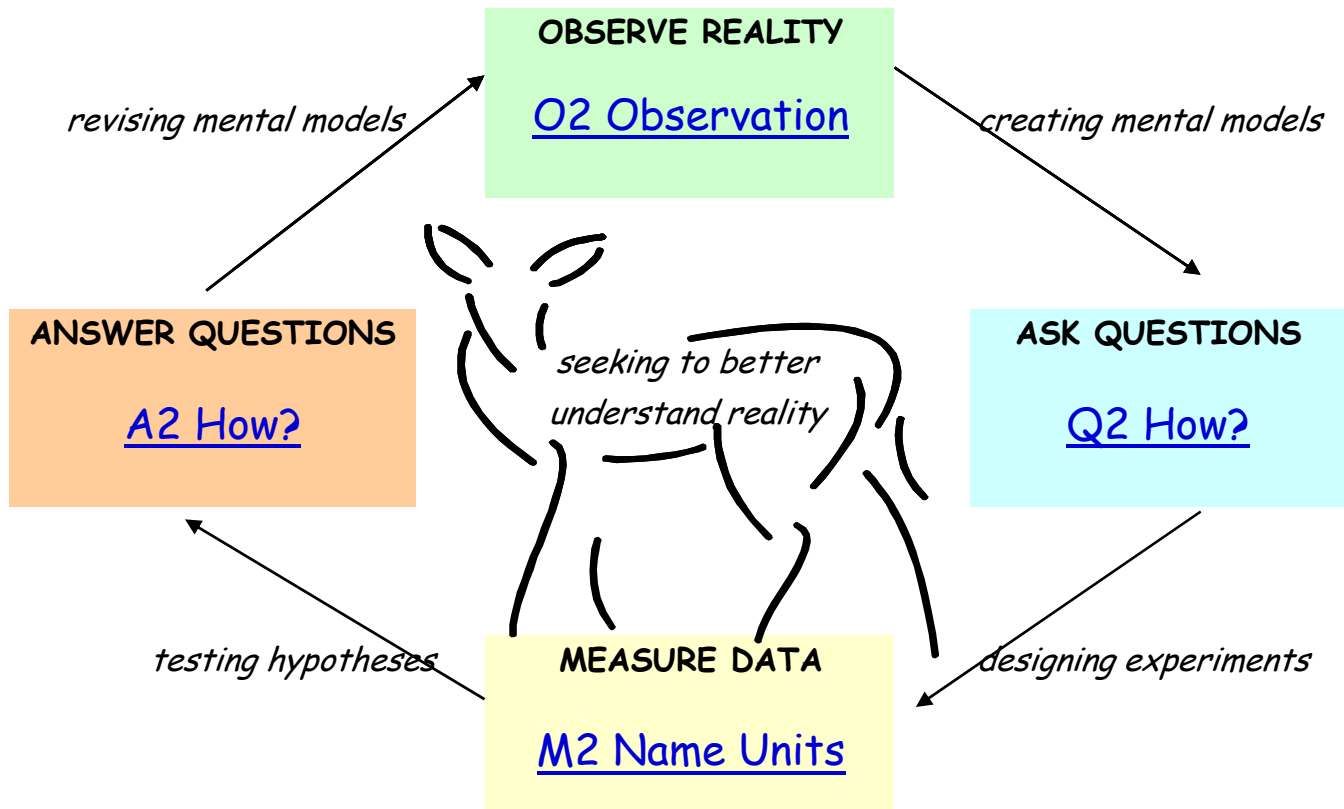


SCIENCE IN ACTION!

Nature's Partners: predators, prey & you

Module 2: Structure: Deer Behavior

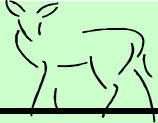


GENERAL LEARNING GOAL: Experience the nature of scientific inquiry (observation, measurements, asking and answering questions), as an alternative to folk psychology. Explain how each of these steps in the inquiry cycle relates to the others and helps us understand the science behind the myths of animal behavior. Explain how all inquiry involves these four steps; however, each person may choose to enter the cycle at a different place.

SPECIFIC OBJECTIVES FOR THIS MODULE IN THE INQUIRY CYCLE

- 2.1 Distinguish between cause and development perspectives used to identify testable proximate hypotheses about body language of deer.
- 2.2 Identify behavior units described as states and events in an ethogram for the species
- 2.3 Integrate information from observations and sources to present the evidence available to test proximate hypotheses about deer behavior.

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Name: _____

Date(s): _____

Duration (min): _____

O2 Objective Observations- PROXIMATE

- STEP 1 Practice thinking analytically like a scientist, by separating objective observations from subjective inference. Use the box at the bottom of this page to clarify proximate inference.
- STEP 2 Watch your clip #1 from M1 and record your observations in the first white box. Repeat for #2.
- STEP 3 Code what you wrote by inserting at the end of each sentence a code from the green box.

VIDEO

Observations (What did the animal do? Sense? Show?)

CODE	CATEGORY	DEFINITION	EXAMPLE
STIM	External stimulus	what the animal appeared to hear, smell, or otherwise sense about its environment	a "cow call" came from a man in camouflage, lying about 30 m uphill
RESP	Response	the animal's actions, including posture, movements, sounds, change in color or hair, etc.	male repeatedly raises the nose & makes a prolonged noise of high pitched, followed by low pitched grunts
INT	Internal state	indicators of hormonal, nutritional, age or other body condition; evidence of motivational state e.g. time since last meal	male has thick neck, rough neck hair; body is covered with mud as if it has been wallowing to cool down; large antlers;
CONT	External context	Other animals, plants, objects etc. around the animal	male is on the edge of a group of 12 females, in a grassy clearing in the evergreen forest
REW	Reward	external consequences that might shape the behavior by reward or punishment	after the bull shoves an intruding male, it leaves the group of cows
O	Other:	define:	



Name: _____
 Date(s): _____
 Duration (min): _____

Q2 Asking HOW? Questions- Hypotheses

STEP 1 Reread your observations in O2. Brainstorm about what questions come to mind about the CAUSE and DEVELOPMENT of behavior in individuals.

STEP 2 Practice rewording your questions about mechanisms in terms of testable hypotheses.

STEP 3 Code your questions in the right hand column, using the categories in the box at the bottom of this worksheet

#	HYPOTHESES ABOUT MECHANISMS OF BEHAVIOR	CODE
1		
2		
3		
4		
5		

CODE	CATEGORY	DEFINITION	EXAMPLE
PC	Cause	Questions about stimulus, response internal state and external rewards	Is a bull more likely to approach a cow if she answers his call?
PD	Development	Questions about how much a behavior is "fixed instinct" or "flexible learning", and how this changes as individuals mature with age	If elk calves were raised in Europe with red deer, would they roar like red deer?
O	Other:	define:	



Name: _____

Date(s): _____

Duration (min): _____

M2 Name Behavior Units (Events & States)

STEP 1 Choose a video clip from M1/O2 and write the source information here:

STEP 2 Use reliable sources from A1 to make a list of behaviors for this species (i.e. an ethogram). OPTION: Use the ethogram provided by your instructor

STEP 3 Watch the clip. Write down the first behavior you see, using a name from the ethogram. Record the duration. Using the codes described in the box at the bottom of this page (or the ethogram), code this action as a state or event. Repeat.

Start	duration (mm:ss)	NAME OF BEHAVIOR	CODE
Time 0			

CODE	CATEGORY	DEFINITION	EXAMPLE
AS	Activity State	A broad category of behavior that includes many specific actions associated with one motivational state (mood or goal); duration of minutes (e.g. an ongoing behavior you would time with a stopwatch)	resting, locomotion, foraging, interacting, maintenance (long duration, timed with a stopwatch in minutes & seconds)
AE	Action Event	Specific action patterns that are short in duration; subunits of an activity state; duration of seconds (e.g. a short action that you would count with a clicker, too brief to time)	step, turn, bite, lunge, call (short duration, counted with tally marks)





A2 Answering HOW Questions

- STEP 1** Search the sources you found in A1 to explore answers to the HOW questions on Q2. **OPTION:** use the link to background information provided by your instructor.
- STEP 2** Focus on one behavior from M2 that you coded as an "action event". Read about it in your sources. Write the name of the behavior in the left column. Answer the Cause and Development questions for this behavior, referring to box at the bottom of this page and O2. Cite the source(s) in parentheses.
- STEP 3** Repeat Step 2 for a behavior that you coded in M2 as an "activity state". Note that an activity state relates to an activated physiological system, so be specific about internal state.
- STEP 4** Reread what you wrote. Decide what aspects are folk psychology, and edit the words to state your idea in more scientific terms.

Behavior	CAUSE? (Source)	DEVELOPMENT? (Source)
EVENT		
STATE		

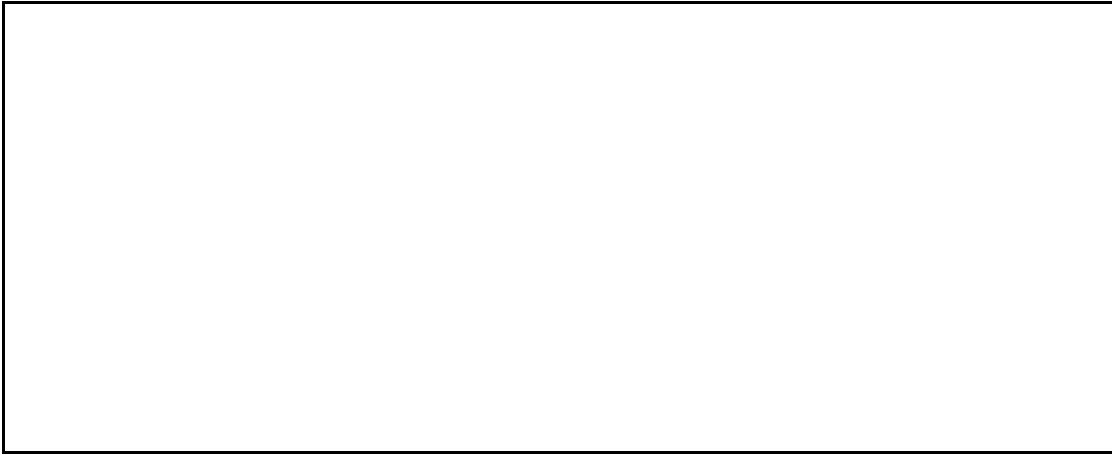
CODE	CATEGORY	DEFINITION	EXAMPLE
PC	Cause	Answers about stimulus, response internal state and external rewards	Mature males in rut respond to the stimulus of female urine by sniffing it and lifting the lip (analogous to a snapshot w/telephoto lens)
PD	Development	Answers about how much a behavior is "fixed instinct" or "flexible learning", and how this changes as individuals mature with age	Young males ignore female urine, but as they reach puberty, they are much more likely to sniff the urine and follow the female (analogy of a video w/telephoto lens)
FP	Folk Psychology	Answers in terms of human-like beliefs, emotions, desires; including "for the benefit of the species", or "to spread his genes"	stags spar because they are testy during the rutting season and their tempers flare easily; bulls want to know if there is a cow in the area when they hear a call, and approach to see if she wants to mate

EVALUATION/FEEDBACK (optional to earn participation points)

1. What worked?



2. What did not work?



3. Suggestions?

