WFSC 422	**HINTS: COMPLETING AN ACTION FORM**
START	AB=CDEF	Folk Psychology

An ethogram is like a dictionary written from the Scientific Perspective of an ethologist (AB=CDEF). It helps us move beyond Folk Psychology, to understand the language of other animals from their perspectives. Want some useful tips for writing an ethogram? Click on the highlighted links below to jump to bookmarks within this document.

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NAME OF ACTION TRAIT OBSERVED: (N)

CODE: (C)

TYPE OF ACTION TRAIT: (T)

FORM OF THE ACTION TRAIT: (F)

VARIATION IN THE ACTION TRAIT: (PD)

CAUSE: (PC)

FUNCTION(S): (UF)

EVOLUTION: (UE)

FUNCTIONAL CATEGORY: (FC)

PHYSICAL (SUB)CATEGORY: (PSC)

OTHER NAMES USED TO DESCRIBE THIS ACTION: (ON)

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NAME OF ACTION TRAIT OBSERVED: (N)

1. If this is an event, name the action in terms of "form" …NOT… "function", to avoid biasing your interpretation. Why? Each action may have several functions (eg. a tail wag may be friendly or aggressive-excited, a yawn may be sleepy or aggressive).

2. Choose the name such that you are describing a "<u>trait</u>" based on physiological processes subject to change during evolution or development, eg. "bite" rather than "threat". Avoid folk psychology terms, as they may bias interpretation of the action from the animals' perspective
3. If the action trait is defined in terms of an activity state, then it is appropriate to use a term associated with a functional category (e.g. reproductive activity, feeding activity)

CODE: (C)

1. Use the. first <u>2-3 letters</u> of the name or another unique set of letters that has not already been assigned as a code for another action pattern in this ethogram. If the action varies in intensity, use a letter code followed by an intensity code, eg. WAG1, WAG2.
2. The purpose of the code is for <u>rapid recording</u> of several actions while recording data in a scientific study.

TYPE OF ACTION TRAIT: (T)

1. an <u>event</u> has a brief duration, and could be repeated in a discrete manner that could be counted (e.g. you could use a shopping clicker), eg. " a Step", "Blink",
2. an ongoing <u>state</u> has prolonged duration (e.g. you could time it with a stopwatch) and there may be some variation in the way movements are combined, eg. "Walking", "Sleeping"
3. the reason for making this distinction is that the underlying physiological model differs for action traits that are events ("hard-wired pathways" of neural networks in the cerebellum of the midbrain) compared to states (neuro/endocrine system linking the "reptile brain" in the limbic region, the "gray matter" in the cortex, and the "hard-wired pathways" of the cerebellum)

FORM OF THE ACTION TRAIT: (F)

1. Strive to present a "video clip in words" or "<u>mental image</u>" so another observer could reliably recognize this action when it occurs in a different individual, time, and/or place. The action should be one that occurs in many individuals within the population, not just an ideosyncratic invention of one individual, eg. one person might invent a word, but it is not put in the dictionary until many individuals use it. Describe <u>only what you observe</u> in terms of movements, postures, position of body parts, color of skin patches, movement of fur or feathers, sound of vocalizations, odor of scent released, etc.
2. <u>Edit out your own interpretation</u> or mental model of the development, cause and function of the action. Put this information under the categories of Variation, Cause or Function (see below).
3. Think in terms of describing a physical "trait" in terms of the "<u>action systems</u>" coordinating movements via muscles, nerves and glands of an individual.

4. Be explicit if there are certain features of the action that are highly <u>exaggerated</u>, <u>stereotyped, or conspicuous</u> as this may provide clues for hypotheses about the ritualization of the action during evolution (eg. Drickamer et al. 1996: 62, 229).
5. Note that you are describing only the action of one individual, <u>not an interaction</u> among individuals. If you observed an interaction, focus on just the action pattern of the actor, describing the action of the other individual(s) as a Cause or Function of the action pattern you describe here.
6. As an <u>analogy</u>, think in terms of the way pronunciation of a word is defined in a dictionary , eg. the sound of the word is based on the movement of the mouth, an action that you can repeat using the pronunciation code in the dictionary.

VARIATION IN THE ACTION TRAIT: (PD)

1. As an<u> analogy</u>, think in terms of the way several pronunciations of a word may be described in a dictionary, such as the different pronunciation of english words in America and England.
2. Describe what you have observed about the <u>development</u> of this action in several individuals.
3. Be explicit about whether the action is <u>discrete or graded in intensity</u> (eg. Drickamer et al. 1996:217)
4. <u>FAP</u>. Is it a "Fixed Action Pattern", meaning that it occurs the same in all individuals of the population, with little or no variation? The underlying hypothesis is that the neural preprogramming for this action (instinct) is not open to modification due to learning (receiving external information).
5. <u>MAP</u>. Is it a "Modal Action Pattern", meaning that there is moderate variation on a general theme in all individuals of the population? The underlying hypothesis is that the neural preprogramming interacts with external information in shaping (learning) this action, and individuals may have been exposed to variable information in their environment.
6. <u>VAP</u>. Is it a "Variable Action Pattern", meaning that it varies greatly among individuals? The underlying hypothesis is that this action was shaped by learning depending on the reward contingencies and consequences of the action, with little neural preprogramming.
7. <u>AAP</u>. Is it an "<u>Abnormal Action Pattern</u>", meaning that it is observed repeatedly in a particular individual with a unique history of development, eg. "pacing" at a fence, or "floating limb"? The underlying hypothesis is that the environment in which the individual was raised or enclosed did not include stimuli typically encountered in the natural environment of the species.
8. Be explicit about your hypothesis regarding the "<u>learning systems</u>" involved, eg. preprepared, unprepared, counterprepared (eg. Drickamer et al. 1996: 203-204).
9. <u>Avoid Folk Psychology</u> terms such as "innate", "instinctive", replacing them with terms such as "appears hard-wired", "neural-preprogramming", "shaped by reinforcement".

CAUSE: (PC)

1. If possible, identify the <u>stimulus associated with a response</u>.
2. Describe the <u>stimulus</u> (eg. "bone" rather than "food"), <u>external events</u> (eg. "another male just approached"), the <u>context</u> of the social group or physical environment (eg. "the gulls are evenly spaced on a grassy meadow", and/or associated behaviors that might function as <u>metasignals</u> in interpretation of the function (eg. "play-bow" in dogs).
3. If no external stimulus is apparent, state that the action <u>appeared spontaneous</u>, realizing the animal may perceive something you cannot. Alternatively, think about the context that might imply something about internal state, eg. how long has it been since the animal has fed?
4. Be specific if the behavior occurs in response to <u>different stimuli or contexts</u>, noting if there are slight variations in the form of the action, eg. the bark of a dog may be soft in response to a command "speak", but may be very loud and intense in response to a knock on the door. As an <u>analogy</u>, think in terms of the different meanings of words in different phrases.
5. Be explicit about your assumptions of the "<u>perceptual system</u>" of the animal and how it may be "tuned differently" than the perceptual system of humans, eg. elephants may respond in alarm to a low frequency sound not audible to humans (eg. Drickamer et al. 1996:98).
6. Be specific about your hypothesis of how this action changes with "<u>motivational state</u>", eg. when a dog has not eaten for 2 days, it responds to an non-preferred food item (eg. a rawhide) with the same actions as it responds to a new bone, however it is more likely to respond to the new bone than the rawhide after it has just eaten a big meal (Drickamer et al. 1996:209).
7. <u>Avoid describing a motivational state as a cause</u>, eg. "the dog was hungry". Such interpretation is in the category of "Folk Psychology" since we cannot observe hunger without sensors inside the animal (Drickamer et al. 1996:209). Interpretation belongs in the category of Function.
8. <u>Avoid using Folk Psychology</u> terms implying intentionality, desire, emotion, belief, eg. "in order to", "wants", "desires", "feels", "believes", "knows", "intends","drive", "instinct", "innate", "hungry", "thirsty", "afraid". Reword such phrases in terms such as: "as if", "goal-directed", "oriented toward", "more likely to happen", "contingency", "previous experience", "internal state", "reproductive condition", "low intensity", "incipient movement".

FUNCTION(S): (UF)

1. As an <u>analogy</u>, think in terms of the various meanings of a word described in a dictionary.
2. Describe the <u>consequences </u>of this action in terms of what you observed to happen after the action, eg. the response of another individual , change in the environment, or change in behavior of the actor.
3. Include your <u>interpretation or hypothesis</u> about how the consequence varies relative to the form of the trait and whether this would have any effect on maturation, survival and reproduction, eg. are individuals that show this action

more likely to obtain a mate? State your hypotheses in the past tense, eg. "Those male gulls that long-called were more likely to attract a mate and reproduce".

4. One option is to develop hypotheses about how the same action might have <u>different functions</u> depending on the causal context, eg. a bark in response to the word "speak" may have a foraging function if the companion provides a dog bone, whereas in the context of a knock on the door, the bark may have the function of alarm. Be explicit about how experience may have led up to a learned association between stimulus and response.

5. An option is to develop hypotheses about how the action may be directed toward a <u>goal</u> controlled by a motivational system, eg. when a dog has not eaten for 24 hours, it approaches the food bowl and barks, an action usually resulting in delivery of food by a human companion.

6. Another option would be an hypotheses about whether the variation observed is an <u>evolutionarily stable strategy (ESS),</u> eg. two heritable variants of a trait coexist because each has advantages under different conditions or neither has an advantage under the same conditions (eg. Drickamer et al. 1996:55). Sometimes the function of a trait may be a heritable <u>conditional strategy</u>, eg. "if there is rainfall, then court; otherwise do not reproduce".

7. If the action functions in communication, develop an hypothesis about how the design of the signal influences the <u>distance and duration</u> of the information conveyed, or how the meaning changes with <u>context, composite signals or metasignals</u> (eg. Drickamer et al. 1996:217).

8. Be explicit if you think the action functions as a <u>behavioral isolating mechanism</u> (eg. Drickamer et al. 1996:68).

9. To <u>avoid Folk Psychology</u> and/or criticisms of <u>circular reasoning</u> in "Adaptationist Story-telling", edit out phrases such as: "for the good of the species", "for the survival of the group", "to pass on genes", "survival of the fittest", "group selection", (eg. Drickamer et al. 1996:54-57). Reword your ideas using terms such as "hypothetically", "fitness", "differential reproduction", "inclusive fitness", "direct fitness", "interdemic selection", "kin selection", "individual selection".

EVOLUTION: (UE)

1. Compare how the form of this action is similar to, or different from, action patterns observed in <u>closely related species</u> (eg. Drickamer et al. 1996:62-66).

2. Develop an hypothesis about what might be an <u>ancestral</u> form of the trait and what might be the <u>derived</u> form of the trait resulting from a change in proportion of genotypes across generations.

3. If this action is an FAP with the function of reproduciton, be explicit about whether you would hypothesize that this action is part of a <u>Mate Recognition System</u> (see Drickamer et al. 1996:68); and/or has changed as a process of <u>ritualization</u> (Drickamer et al. 1996:229).

4. Note differences in the developmental, physical or social <u>contexts of the species</u> that you are comparing, to explain why the proportion of genotypes might have shifted over generations due to differences in their environments exerting different selection pressure.

5. Be explicit about what aspect you are hypothesizing is <u>heritable</u>, eg. is it the perceptual, action, motivation or learning systems associated with expression of the trait? For example, the trait that changes over generations might be the "ability to remember locations of caches", although the form of the "cache-retrieval" action event may be very similar (e.g. comparing three species of jays, Drickamer et al. 1996:205).

FUNCTIONAL CATEGORY: (FC)

1. A "functional category" is another word for "activity state".
2. One action pattern may be <u>cross-classified</u> in several functional categories, depending on cause and consequence of variations in the action, (eg. mounting may occur in the category of Conflict in the context of two males, and Reproductive in the context of a male and female).
3. For statistical purposes, sometimes it is necessary to lump action patterns that occur in the same functional category. Some events may occur so rarely that the data matrix is full of zeros. By adding the tallies for all events within a broader functional category (activity state), then the numbers are more likely to be in a range suitable for statistics.
4. Some examples of functional categories (and subcategories) often used by ethologists are (see Drickamer et al. 1996:217-224):

Affiliative (greeting, submissive, friendly),
Agonistic (submissive, defensive, aggressive),
Alarm (alarm-call, escape),
Conflictive (appeasement, agonistic),
Display,
Dominance,
Elimination (urination, defecation),
Ingestion (foraging, food-handling, eating, drinking),
Investigation (object-manipulation, exploration),
Maintenance (self-grooming, allo-grooming),
Parental Care (maternal-care, paternal-care, allo-parental),
Play (object-play, solo-play, social-play),
Recognition (species, deme, individual, neighbor, class, kin),
Reproductive (courtship, mate guarding),
Social Interaction (Affiliative, Agonistic, Conflictive, Parental, Play, Reproductive).

PHYSICAL (SUB)CATEGORY: (PSC)

1. Some examples of physical subcategories for the functional category of "Social Interaction" include: Contact-promoting, Distance-increasing, Non-contact, Contact, Cut-off, Vocalization, Posture. This is optional, used by very objective ethologists.

2. Within a functional category, it may be useful to classify action patterns in terms of the physical form of the actions, reserving judgement on the interpretation of function and intentions. For example, the function of a "Yawn" may depend on the context. In the context of communication between a mother and infant, a Yawn may be Contact-promoting. In the context of two males, a Yawn may be Distance-increasing.
3. If the focus of the ethogram is communication signals, they may be categorized in terms of the physical channel within which information is conveyed (eg. Drickamer et al. 1996: 224-228)

OTHER NAMES USED TO DESCRIBE THIS ACTION: (ON)

1. To avoid "reinventing the wheel" and to compare your work with that of others, it is important to cross reference different names for the same action.
2. Look at how this action has been described in other published and unpublished behavioral catalogues. (A behavioral catalogue is a list of action patterns used in a particular study).
3. In literature published in the 1960's and '70's, actions were named in terms of function. After this was critiqued as a potential source of bias in interpretating the actions, the practice was discontinued in favor of using names that described the form rather than function.
4. In some work settings, coworkers have developed their own names for actions that they recognize. One difficulty is that different people use different names for the same action. This is the place to document the various terms used for an action. If the names have not been published, refer to the source as (John Doe, personal communication).

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