# Behavior

**Observing and measuring animal behavior-** Animal behavior includes all the ways animals interact with other organisms and the physical environment. Behavior can also be defined as a change in the activity of an organism in response to a stimulus, an external or internal cue or combo of cues. Behavior is shaped by natural selection.

TYPES OF MEASURE - Once you have identified your behaviour categories and clarified the focus of your study, you need to think about how you will measure the behaviours you observe. Four types of measure are commonly used in behaviour studies: latency, frequency, duration and intensity.

**1. Latency**- Latency is the time interval from some specified event to the onset of the first occurrence of the behaviour. Its units are those of time, e.g. seconds or hours. Suppose, for example, you are investigating the territorial behaviour of male blackbirds. You might make a tape recording of the songs of a territorial male blackbird, play these to other territorial male blackbirds and then record how long it took these blackbirds to reply by singing themselves.

**2. Frequency** Frequency refers to the number of occurrences of the behavior per unit time. Its units are those of time-\ e.g. min-1 • Suppose, for example, you are investigating the drinking behavior of two different species of hamster. You might record how often, over the course of a 24-hour period, individuals of each species bring their mouths into contact with the tubes that lead from their water bottles (a structural description of a behaviour that is presumed to equate to drinking).

**3. Duration** The duration of a behavior is a measure of the length of time for which a behaviour lasts. Its units are those of time, e.g. seconds or minutes. For example, the drinking behaviour of hamsters could be quantified by the duration of each' drink' ('animal brings mouth into contact with the tube that leads from its water bottle') as well as by the frequency of its drinks.

**4. Intensity**- A universal definition of the intensity of a behavior cannot be given, and intensities may be measured in various units. However, they can be a valuable way of helping to describe behaviour. For example, one might record the height of a jump (in meter), the amplitude of a vocalisation (in decibels) or the aggressiveness of an interaction (by means of an arbitrary, but clearly defined, scale).

SAMPLING RULES- You will need to decide how you are going to sample. Four main methods are used.

1. **Ad libitum sampling** -This approach is most appropriate during initial observations when you don't know much about the behaviour of the organism. Ad libitum sampling allows you to build up a picture of the sorts of ways in which the organism behaves. Ad libitum sampling is also helpful for recording rare behaviours - you simply make a note of them if and when they occur.
2. **Focal sampling-** In focal sampling you focus (hence the term) on just one individual and record what it is doing. Focal sampling can also be carried out on other 'units' aside from individuals. For example, you might focus on a litter of young animals or on a pair of animals.
3. **Scan sampling** - Here you scan a whole group of individuals and, in some way, record what they are doing. For example, you might scan a flock of sheep and record

a) how many individuals are feeding.
b) how many are ruminating.
**c)** how many are moving, etc..

RECORDING RULES Y OU will need to decide how often you are going to record your results. Three main approaches are used.

1. **Continuous recording** Here, as the name suggests, you record continuously. This is really only possible if:
   A. you select just one individual (focal sampling).
   B. you have only a small number of behaviour categories which you can accurately remember without having to take your eyes off the animal.
   C. Animal changes behaviour only infrequently
2. **Instantaneous sampling** In instantaneous sampling, a signal goes at a regular internal (say every minute). The signal might be an electronic beep, or you might work in a pair, with one of you keeping an eye on a watch with a second-hand and telling the other one of you, who is recording, whenever it is time to record. In either case, whenever the signal is given or beep heard, you record your observation.
3. **One-zero sampling** Here a beep goes, or a signal is given, at regular intervals. You then record whether or not a particular behaviour has occurred since the last beep. If it has, you record a 1 (one). If it hasn't, you record a O (zere) (hence the name 'one-zero sampling').

**a.** One-zero sampling is most often used with focal sampling for recording occasional behaviours which don't last long, such as a bout of grooming or play.

**b.** One-zero sampling can be combined with instantaneous sampling, so that you record whatever the animal is doing when the beep goes (or signal is given) and you record whether or not certain behaviours have occurred since the last beep or signal.

**RECORDING MEDIUM**

Finally, you need to think about how you will record your results. Several approaches are possible.

1. **Check sheets** A check sheet is a recording medium you will need to design yourself. An example of one, used by one of the writers, is given in Figure 1. This check sheet was used for recording the behaviour of male red deer on the Isle of Rhum, Scotland. Both focal and scan sampling were used and a combination of instantaneous and one-zero sampling, with an electronic beep going off every 60 seconds.

A. ACT stands for' activity' (i.e. the behaviour of the focal individual when the beep went off)

B. GRT for' gradient' (Rhum is very hilly and I was looking at energy expenditure in the deer),

C. D. RN for 'rain'

D. WD for 'wind direction' (8 points of the compass used)

E. WS for 'wind speed" (Beaufort Scale).

F. Also recorded were cloud cover, the presence/ absence of flies and the area in which the focal animal was at the beginning of the 30minutes recording. (The whole of the study area was divided into 100 m x 100m squares.) The study was carried out during the annual mating season when dominant adult males hold harems of females. Kleptogynists are less successful male deer which occasionally try to steal females.

| DATE | | | | TIME | ANIMAL | WD | WS | CLOUD | | FLY | | | | AREA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Distance moved | Roars | | | Group Information | | Nearest Harem | | Kleptogynists | | |
| Mins | ACT | GRN | RN | | | | | No. | Compos'n | No. | Dist. | No. | Dist. | |
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G. **Tape recorder** A tape recorder can be very useful if it is raining or if you are moving around a lot. It is essential to transcribe your recording the same day, otherwise a lot of detail gets forgotten.

H. **Film** .Both video and still filming can be a valuable way of recording certain behaviours. You may be able to borrow a camera with a telephoto lens or, even more valuably, a camcorder. The great thing about videoing behaviour is that you have plenty of time subsequently to examine the tape in detail.

I. **Automatic recording**- An automatic recording device can be a useful way of recording just one or two behaviours over a long period of time (e.g. several days). For example, a light trip attached to a data logger can be set up to enable the running of a small mammal in a cage to be recorded automatically.