

## Animal Behavior

- 1) Behavior is simple what an animal does
  - a) These behaviors are many times simple, like a cow swishing its tail to help keep biting flies away
  - b) However, some are much more complex such as organized pack hunting of Orca Wales
- 2) History
  - a) Historically humans have studied behavior as a means to an end
    - i) Cave paintings found in southern Spain show how herds of potential prey move, or in South American cultures they would predict waterfowl migrations to know when to expect a food resource.
  - b) While all this was going on in the background of normal human life it wasn't formally described as a science until the 1900's
    - i) Since then behavior has become interwoven in many aspects of biology from the fields of agriculture (domestication, or harvesting tuna etc...), to genetics (looking at what behaviors are inherited)
- 3) Adaptive behavior
  - a) Behavior at its core goes to increase an animal's fitness. This can be done by:
    - i) Innate abilities- these are the abilities an animal is born with (referred to as Nature)
      - (1) Self cleaning in cats
    - ii) Learned behavior- these are behaviors that have been modified in response to the environment (referred to as Nurture)
      - (1) Potato washing in Japanese monkeys
  - b) All behavior has some genetic basis
    - i) Capacity for learned behavior is inherited
    - ii) Behavior is modified by the environment in which the animal lives
    - iii) Therefore, both nature and nurture determine an animal's behavior
      - (1) ex: baby sounds humans and birds are coded in genes, but animals must learn and practice sounds to sound like adults.
  - c) Many behaviors develop over time
    - i) Ex. Baby humans cannot walk (walking is a learned behavior) until their muscles develop
    - ii) Ex. Regional dialects of language
      - (1) Humans
      - (2) White crowned sparrow
- 4) Kinds of behavior
  - a) Instinct
    - i) As mentioned above (see Innate abilities) these are traits animals are born with.
    - ii) These traits have to be coded for in the animals genetic material
      - (1) Ex. Chickens pecking the ground after hatching
      - (2) Cuckoos nest parasites
        - (a) Offspring hatch and instinctively push the other eggs out of nest.
    - iii) Fixed Action Pattern (FAP)

- (1) This is an instinctive behavior that is present in a species that almost always runs to completion
  - (2) This response begins with an outside stimulus.
  - (3) Ex. European Gray-lag Goose
    - (a) After the female lays her eggs, if one egg rolls out of nest she will push it back in with her beak. However, if the egg is removed she will continue the pushing motion as if the egg were still there.
      - (i) This also works with any object (like a golf ball) that resembles an egg.
  - (4) Ex. Three Spine Stickleback
    - (a) Males develop a red breast during the mating season and will fight off any other male in their territory.
    - (b) They respond to the red breast. In lab experiments they fight not only other three spine sticklebacks but also any other fish species with a red breast, or even non-living objects painted red.
- iv) Habituation
- (1) This is a response where animals can ignore meaningless or irrelevant stimuli
    - (a) Ex Grey Squirrels and the boy who cried wolf effect
- v) Imprinting
- (1) This is a form of learned behavior where an organism acquires a specific irreversible behavior at birth
  - (2) Ex. Lorenze and his Geese
    - (a) In the first 2 days, goslings will accept any moving object as its mother
    - (b) Lorenze was the moving object, and when the goslings were exposed to the true mother they rejected her.
  - (3) Ex. Salmon
    - (a) After birth salmon learn the chemical queue of there individual stream
    - (b) They swim out to sea to mature and always returned to the same stream to breed
- vi) Classical Conditioning
- (1) This is where animals associate one stimulus with another
    - (a) Pavlov's Dogs
      - (i) Pavlov would ring a bell before he would feed the dogs
      - (ii) When he would ring the bell alone the does would begin to salivate
- vii) Operant conditioning
- (1) Process by which animals learn to associate one behavior with a reward or punishment
    - (a) Skinners rats
      - (i) Rats had a choice of levers, one gave food as a reward, the others administered an electrical shock.
      - (ii) After a few trials rats would only pull the lever that gave the food reward
- viii) Observational learning
- (1) Ability to learn by observing the actions of others
    - (a) This allows behaviors to pass on to succeeding generations
    - (b) Ex. English tits

- (i) Learned to open milk bottles on doorstep and drank cream. It quickly spread across England
- ix) Reasoning
  - (1) Ability to preform appropriate behavior on first attempt with no prior experience
    - (a) Chimps will stack boxes to reach a banana that is to high.
- 5) Animal Movements
  - a) Kinesis
    - i) A directed change in activity rate in response to an environmental stimulus.
      - (1) Sowbugs (Pillbugs or Rolly Pollies) – they move slow in moist areas, speed up in dry areas; tends to keep them in the moist area
  - b) Taxis
    - i) Directed movement in response to a stimulus i.e. the organism moves towards or away from a stimulus
      - (1) Phototaxis
      - (2) Chemotaxis
      - (3) Galvonotaxis
  - c) Migration
    - i) Seasonal movements of animals over long distances typically between two regions
      - (1) Butterflies
      - (2) Fish
      - (3) Birds
- 6) Communication is used or species recognition, mating, and social behavior
  - a) Chemical
    - i) Pheromones are hormones that are accepted by other individuals that convey information
      - (1) Releaser pheromone- triggers behavior in another organism
      - (2) Primer pheromone- causes physiological changes in other organisms
        - (a) Moths release pheromones to attract mates
        - (b) Ants mark pathways to food
  - b) Visual
    - i) Aggression
      - (1) Wolves/dogs showing teeth or raising hackles
      - (2) Hiss of cats
    - ii) Courtship
      - (1) Male bird plumage
  - c) Auditory
    - i) Sounds used to communicate over long distances
      - (1) Whale songs
      - (2) Elephants
      - (3) Crickets
      - (4) Birds
  - d) Tactile (touch)
    - i) Social bonding, infant care, grooming, mating
      - (1) Dances

- (a) Bees
  - (2) Chimps grooming
  - (3) Infant care
- 7) Foraging behavior
  - a) Optimized feeding to minimize risk of injury
    - i) Herds
      - (1) Zebras
      - (2) "bait balls"
    - ii) packs
      - (1) wolves
- 8) biological rhythms
  - a) circadian rhythms
    - i) animals "biological clocks"
    - ii) diurnal
    - iii) nocturnal
    - iv) crepuscular
  - b) lunar cycles
    - i) grunion fish
- 9) sexual selection
  - a) polygyny
    - i) tends to favor males
      - (1) male provides little besides sperm
  - b) polyandry
    - i) favors females
      - (1) females receive gifts from many males and elicit help from many males to care for young
  - c) monogamy
    - i) mating with one partner only