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Gain an understanding of signal design, how they evolve, the information they purport to convey, and the costs and benefits that signalling imposes on both the signaller and receiver

- Communication – signals provided by of organism that is meant to be perceived by, and influence the behaviour of, another
- Communication is used to maximise fitness
- Animals communicate with each other via a range of different sensory modalities
 - Visual – e.g. male birds using bright plumage to impress females
 - Acoustic – e.g. frogs and toads using advertisement calls to attract females
 - Chemical – many insects produce pheromones
 - Tactile – many species of fish have specialised scales that pick up tactile signals in the water
 - Electrical – many fish living in murky environments
- E.g. signal design in bower birds
 - Experimental design – placed microphones in bowers to record male calls, then generated sonograms that visualise and measure components of the calls
 - Conclusion – acoustic signals differ in different habitats, with less frequency modulation and lower frequency associated with denser habitats
- Signal transmission can be impeded by the physical environment, as well as counter-marking (e.g. males using their scent to cover the scent of others) and signal jamming (e.g. rival cicada males with cut in at specific times to prevent females from responding to previous calls)
- E.g. mimicking filefish
 - Experimental design – produced models of varying resemblance to the pufferfish to determine how alike the mimic fish had to be to reap the benefit of the cover
 - Conclusion – broad region of protection afforded by resemblance to pufferfish, however the more precise the resemblance the higher the protection
- In some cases, signals evolve to exploit pre-existing perceptual mechanisms in the signal receiver
- E.g. courtship of male water mites exploits female feeding response
 - Males hang out on the surface of the water, mimicking prey insects that fall onto the surface of the water and the ripples they produce
 - Females then approach the vibrations expecting food
- E.g. food preference for orange males evolved from a bias for orange coloured food
 - Experimental design – fish were offered coloured objects to determine which colour is preferential
 - Conclusion – fish were most attracted to orange objects, the same colour that the males are
- E.g. sand pillars built by male fiddler crabs exploit the hiding response
 - Pillars are built to exploit the hiding instinct of females when danger is nearby – when threatened females move to the nearest shelter structure
 - Males sometimes scuttle back to their burrows to imitate what they would do if there was a predator, hoping that the close females would also move towards their burrows