

# Animal Cognition

Introduction to Cognitive Science

# Intelligent Animals?

- [Parrot Intelligence](#)
- [Crow Intelligence I](#)
- [Crow Intelligence II](#)
- [Cow Intelligence](#)
- [Orca Intelligence](#)
- [Dolphin Play](#)
- [Funny](#)

# Animal Intelligence

- I try to stay away from using the term intelligence
  - It is a vague term
    - Even in the human case, there are debates as to what constitutes intelligence. Some people postulate many different kinds of intelligence.
  - It is a loaded term
    - Especially when talking about ‘animal intelligence’, people come in with prejudices, making any kind of objective, rational, and scientific study impossible.
  - It encourages putting all things on a linear scale, from less to more intelligent

# Animal Consciousness

- Debates about animal cognition not only often turn into questions about animal intelligence, they also often turn into questions about animal consciousness
- The latter question is actually a little more useful:
  - Consciousness is less vague than intelligence
  - Consciousness is often used (right or wrong; up for debate) as a criterion for rights of animal
- But:
  - We have no scientific explanation for consciousness!
- So:
  - I don't really want to be discussing that either

# Animal Cognition

- Perception
- Memory
- Categorization
- Learning
- Problem Solving
- Creativity
- Tool Use
- Theory of Mind
- Empathy
- Sense of Self
- Communication
- Language Use
- Reasoning

# The Mirror Test

- A famous experiment regarding self-awareness is the 'Mirror Test', developed by Gordon Gallup
  - Animal gets a dot placed on forehead without knowing this
  - Animal gets placed in front of mirror
  - When they act in a way consistent with a recognition that this dot is part of themselves (e.g. they try to remove it on themselves, rather than attack the mirror image), they are said to 'pass' the mirror test and have a sense of self

# Who Passes the Mirror Test?

- Most (all?) [Great Apes](#) (humans, chimpanzees, orangutans, bonobos, gorillas?)
- Various cetaceans (whales, orcas, dolphins, porpoises)
- Various birds ([magpies](#), parrots?, crows?)
- Elephants?
- Does passing really mean a sense of self?
- Does not passing mean not having a sense of self?
  - Mirror test is visual; how about using other senses?

# Failing the Mirror Test

- Dog
- Bird
- Monkey



# Learning and Instinct

- Debates about animal cognition also often turn to the issue of instinct vs learning:
  - Learning is seen as sign of ‘intelligence’
  - But instinct is ‘just’ instinct
- Again, I find such a distinction too simplistic to be of any use:
  - ‘Instinct’ could involve complex cognitive abilities (e.g. perception)
  - There are many forms of learning

# Example: Learning from Others

- Exposure: An organism learns about something simply by being exposed to it as a result of being around or following someone else
- Stimulus Enhancement: An organism learns something by directing attention to the same thing that someone else is interacting with (such as a tool)
- Emulation: An organism learns something about the nature of something as a result of someone else manipulating that something
- Ritualization: An organism learns to signal something as a result of repeated behavioral interactions with someone else (e.g. holding out hands)
- Mimicking: Simply 'aping' someone else's behavior
- Imitation: Learning to do something by seeing someone else do it and understanding the intention behind it

# Tool Use and Creativity

- Tool use is also often seen as a ‘defining’ characteristic of intelligence
- Lots of examples:
  - [Crow I](#)
  - [Crow II](#)
  - [Chimpanzee](#)
- Striking phenomena, but there is little context brought in.
  - No attempts to explain in terms of cognitive architectures or relations to other cognitive abilities
- Same is true with various animals doing ‘novel’ or creative things.

# Animal Perception

- I think a fruitful area of research into animal cognition (just because it is has so much less 'baggage' than some of the others) is animal perception.
- Basic:
  - What kinds of things do which animals perceive?
- More interesting:
  - Explaining this by differences in senses
- And really interesting:
  - Explaining this by differences in brain

# Animal Cognition Research: Problem and a Solution?

- Much of what you hear, see, or read about animal cognition are striking examples.

But:

- Often anecdotal evidence; isolated examples
- Anthropocentric interpretation: we juxtapose concepts of human cognition onto animals
- What we need is:
  - Concepts of cognition that can capture differences in animal cognition
  - I.e. we need a mature cognitive science!