Interpreting the Cognition Underlying Behaviour

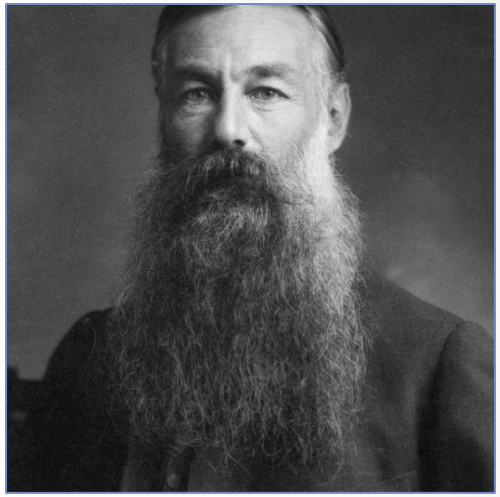
Problems with Parsimony

Interpreting Behaviour

Morgan's Canon

An influential parsimony principle that guides interpretations of animal behaviour in contemporary comparative psychology.

> In no case is an animal activity to be interpreted in terms of higher psychological processes if it can be fairly interpreted in terms of processes which stand lower in the scale of psychological evolution and development. (Morgan 1894)



Conwy Lloyd Morgan

Parsimony principles

- Morgan's Canon raises a number of questions.

(1) What are 'lower' processes in the scale of psychological evolution and development?

- By the lights of evolution, all extant cognitive processes are equally evolved.

Parsimony principles

- Consensus: 'higher processes' include metacognition, metarepresentation, reason, inference.
  - May be cognitively undemanding correlates – e.g. metacognitive emotions (Proust 2012; Michaelian 2016).

- Many arguments for lean attributions are driven by unexplicated intuition pumps.

Parsimony principles

(2) When is it necessary to invoke 'higher' processes?

- Some interpretations are justified by behaviour.
- Some justified by further explanatory goals.
    - Explanatory pressures emphasise differences between humans and animals.
- Philosophical theorising drives some rich attributions.
    - Contentious philosophical claims may be accepted uncritically by psychologists (etc).

Interpreting behaviour by appeal to parsimony

- All great ape species gesture communicatively.

Tomasello (2008), Scott-Phillips (2015):

- We should attribute meaning to infant but not great ape gestures – because only infants acquire language, which requires communicative intent.
  - Same behaviour, different underlying cognition.
  - Motivated by parsimony.

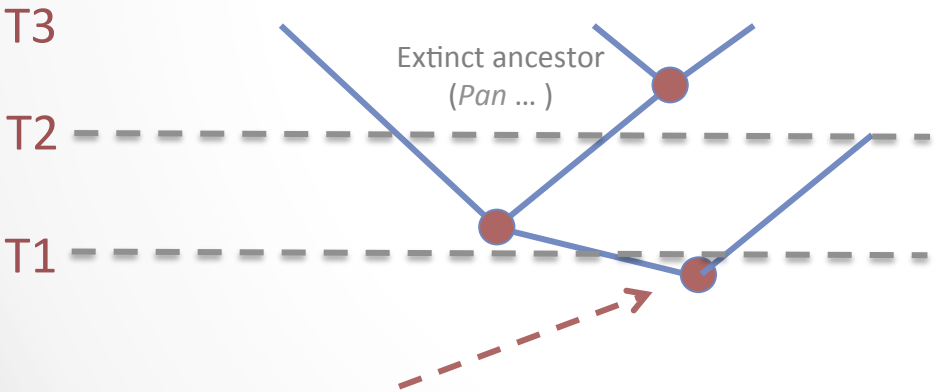
Parsimony considerations can pull in different directions

Sober (2005): Cladistic Parsimony

- Where comparable behaviours are present in neighbouring clades, it is parsimonious to assume a common underlying cognitive mechanism that evolved in an ancestral trait.
  - Same behaviour, same underlying cognition.
  - Also motivated by parsimony.

The great ape family tree

Human (*Homo sapiens*) | Chimpanzee (*Pan troglodytes*) | Bonobo (*Pan paniscus*)



Scenario 1: Gestures emerge at T1, with common underlying mechanism.

- Similar trait, same mechanism at T3

Scenario 2: Gestures emerge at T1, with a common underlying mechanism, enriched in *Homo* clade at T2.

- Similar trait, different mechanisms

Scenario 3: Gestures emerge independently in *Homo* and *Pan* clades at T2, different underlying mechanisms.

- Similar trait, different mechanisms

Scenario 1 is cladistically parsimonious because posits only one genetic change.

Cladistic parsimony vs. Morgan's Canon

Cladistic parsimony preserves

- evolutionary gradualism
- continuity across species

However CP and MC can pull in different directions.

- Casual appeals to parsimony don't adequately justify assumptions about particular cognitive models.
- Must be argued carefully, on a case by case basis.

References

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