

Parsimony -- Philosophy 920 – Spring 2014

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This course will mainly consider parsimony arguments in science, though there will be some attention to parsimony arguments in philosophy. After a brief historical overview of attempts to justify Ockham's razor before 1900, we will consider 20th century attempts to formulate and justify the principle of parsimony in a probability framework. To do this we'll need to look at the basics of Bayesianism and at some ideas from frequentist statistics. Then we'll turn to the subject of how parsimony is and ought to be used in philosophical argumentation. This will encompass a variety of philosophical topics – for example, the argument from evil, the mind/brain identity theory, Platonism about mathematics, realism in meta-ethics, mental causation, and solipsism. Then we'll discuss how probabilistic ideas about parsimony apply to the conflict between Copernican and Ptolemaic astronomy. Finally, there will be two case studies from contemporary science: the use of parsimony in evolutionary biology to make phylogenetic inferences and its role in the controversy in cognitive psychology over whether chimpanzees form mental representations of the mental states of others.

Requirements: You should attend all meetings of the seminar and participate in discussion. Your grade will be influenced by both. A homework assignment is due at the 3rd seminar meeting and a double-spaced 7 page paper is due at the 9th. Details about both will be explained. There also is a term paper (15 pages) that is due at the last seminar meeting. You should discuss your plans for your term paper with me before week 12.

1. Introduction

Sober, *OR*, chapter 1.

Alan Baker (2010), "Simplicity." Stanford Encyclopedia of Philosophy: <http://plato.stanford.edu/entries/simplicity/>

James Lennox, "Nature does nothing in vain" in his *Aristotle's Philosophy of Biology*. Cambridge UP, 2001, pp. 205-224.

2. Kant on the Principle of Parsimony (led by James Messina)

Primary: (1) the two parts of the "Appendix to the Transcendental Dialectic" in CPR (so A642/B670-A704/B732, which is pages 590-623 in the Wood/Guyer translation). Concentrate on the first part, where the principle of parsimony is discussed; the second part focuses more on the regulative role that the ideas of the soul, world, and God play in our efforts to systematize nature (this is where Kant seems to be saying that we have to think of nature as if it were designed by God). (2) section 5 of the introduction to the Critique of Judgment (so 5:181-5:186, which is pages 68-73 in the Guyer translation). Here Kant talks about the principle of parsimony again and his account appears to differ from the one in CPR.

Secondary: (1) pages 423-448 in the 2004 edition of Henry Allison's **Kant's Transcendental Idealism**, where Allison talks about the Appendix. (2) The first two sections (so pages 290-301) of Fred Rauscher's "The Appendix to the Dialectic and the Canon of Pure Reason: The Positive Role of Reason", which is in the 2010 **Cambridge Companion to Kant's Critique of Pure Reason** (we would skip the later sections of the paper, which deal with the Canon of Pure Reason, where considerations about morality and the highest good are discussed)

3. Some Probability Tools (Bayesianism and Likelihoodism)

Sober, *OR*, chapter 2, pp.1-15 (up to the start of "Ockham's Razor for Bayesians").

Mike Titelbaum, *A Guide to Bayesian Epistemology*, chapter 3 (skipping 3.2.2), chapter 4 (skipping 4.2.1, 4.2.2, and 4.3), and chapter 5 (up to the start of 5.2.1).

Brandon Fitelson (2011), "Favoring, Likelihoodism, and Bayesianism", *Philosophy and Phenomenological Research* 83: 692-704, and Sober's reply.

4. Prior Probabilities, Jeffreys, and Popper

Dorothy Wrinch and Harold Jeffreys (1921) "On Certain Fundamental Principles of Scientific Inquiry." *Philosophical Magazine* 42: 369-390. Read pp. 379-390.

Robert Ackermann, "A Neglected Proposal concerning Simplicity." *Philosophy of Science*, 1963, 30: 228-235.

Karl Popper, "Simplicity," chapter 7 of *Logic of Scientific Discovery*, Hutchinson, 1959, pp. 136-145.

C. Howson, "On the Consistency of Jeffreys' Simplicity Postulate and its Role in Bayesian Inference." *Phil. Quart.*, 1988, 38: 68-83.

5-6. Reichenbach's theorem, a Reichenbachian likelihood inequality, and Reichenbach's principle of the common cause

Titelbaum, section 4.2.1.

Sober, *OR*, chapter 2, pp. 23-37.

Frank Arntzenius, "Reichenbach's Common Cause Principle." *Stanford Encyclopedia of Philosophy*. 2010.
<http://plato.stanford.edu/entries/physics-Rpcc/>

Sober, "Venetian Sea Levels, British Bread Prices, and the Principle of the Common Cause." *British Journal for the Philosophy of Science*, 2001, 52: 331-346.

Christopher Hitchcock, "The Common Cause Principle in Historical Linguistics." *Philosophy of Science* 1998, 65: 425-447.

7. Model Selection and Bayesian Ockham's Razor

Sober, *OR*, chapter 2, pp. 45-65.

Forster and Sober, "How to Tell When Simpler, More Unified, or Less *Ad Hoc* Theories Will Provide More Accurate Predictions." *British Journal for the Philosophy of Science* 1994, 45: 1-36.

M. Forster, "Key Concepts in Model Selection: Performance and Generalizability." *Journal of Mathematical Psychology* 44: 205-231 (2000)

W. Jefferys and J. Berger (1992) "Ockham's Razor and Bayesian Analysis." *American Scientist*, 80: 64-72.

Malcolm Forster and Elliott Sober "Lessons in Likelihood: A Critique of Jefferys and Berger's 'Ockham's Razor and Bayesian Analysis'." *American Scientist*, 1992, 80: 212-13.

MacKay, D. (2003), "Model Comparison and Ockham's Razor." Chapter 28 of *Information Theory, Inference, and Learning Algorithms*. Cambridge: Cambridge University Press.

8. Parsimony in Modern Philosophical Arguments

Sober, *OR*, chapter 5.

James Woodward (2013) "Simplicity in the Best Systems Account of Laws of Nature." *Brit. J. Phil. Sci.*, 1-33.

Jonathan Vogel, "Cartesian Skepticism and Inference to the Best Explanation." *Journal of Philosophy*, 1990, 87: 658-666.

Theodore Sider, "Against Parthood." In Karen Bennett and Dean W. Zimmerman, eds., *Oxford Studies in Metaphysics*, volume 8 (Oxford: OUP, 2013): 237–93.

Elliott Sober, "Evolution, Population Thinking, and Essentialism." *Philosophy of Science*, 1980, 47: 350-383

M. Huemer, "When is Parsimony a Virtue?" *Phil. Quarterly*, 2009, 59: 216-236.

Sydney Shoemaker, "Time Without Change." *Journal of Philosophy*, 1969, 66: 363-381.

9. Parsimony in Comparative Psychology – Morgan’s Canon and the Principle of Conservatism

Sober, *OR*, chapter 4. Reread section in ch 1 on Morgan.

Andrew Whiten (1996). "When does Smart Behavior-Reading become Mind-Reading?" In P. Carruthers and P. Smith (eds.), *Theories of Theories of Mind*, Cambridge U Press, pp. 277-292.

D. Povinelli and J. Vonk (2004): "We don't need a microscope to explore the chimpanzee's mind." *Mind and Language* 19: 1–28.

Tomasello, M. & Call, J. (2006) "Do Chimpanzees Know what Others See, or Only What They are Looking at?" In S. Hurley and M. Nudds (eds.), *Rational Animals?*. New York, NY: Oxford University Press, pp. 371-384.

Recommended:

Heyes, C.M. (1998). "Theory of mind in non-human primates." *Behavioral and Brain Sciences*, 21, 101-148.

Derek C. Penn and Daniel J. Povinelli (2007): "On the lack of evidence that non-human animals possess anything remotely resembling a 'theory of mind'." *Phil. Transactions of the Royal Society B* 362:731-44.

10. More on Chimpanzee Mind-Reading

Daniel Dennett (1978), "Skinner Skinned." *Brainstorms*. MIT Press.

Daniel Dennett, "Real Patterns." *JPhil*, 1991, 88: 27-51.

Sober. *OR*, chapter 4, pp. 24-end.

Simon Fitzpatrick, "The Primate Mindreading Controversy: A Case Study in Simplicity and Methodology in Animal Psychology." In Robert Lurz (ed.), *The Philosophy of Animal Minds*. Cambridge University Press, 2009, pp. 258-277.

Simon Fitzpatrick, "Doing away with Morgan's Canon." *Mind and Language* 23: 224–246. (recommended)

11. Cladistic Parsimony

Sober, *OR*, chapter 3, pp. 1-19.

David Baum and Stacey Smith, *Tree-Thinking: An Introduction to Phylogenetic Biology*, 2013, pp. 9-23, 35-55, 90-99, 173-207.

12. More on Cladistic Parsimony

Sober, *OR*, chapter 3, pp. 19-end.

Cunningham, C., Omland, K., and Oaskley, T. (1998): "Reconstructing Ancestral Character States – A Critical Appraisal." *Trends in Ecology and Evolution* 13: 361-66.

13. Baker on Quantitative Parsimony and Myrvold on Unification

Alan Baker, "Quantitative Parsimony and Explanatory Power." *British Journal for the Philosophy of Science* 2003, 54: 245-59.

Wayne Myrvold, "A Bayesian Account of the Virtue of Unification," *Philosophy of Science*, 2003, 70: 399-423.

Marc Lange, "Bayesianism and Unification: A Reply to Wayne Myrvold." *Philosophy of Science*, 71: 205-215.

14. Janssen's COI

M. Janssen (2002) "COI Stories: Explanation and Evidence in the History of Science." *Perspectives on Science* 10: 457-522.

15. Wrap Up