

THE THEORY LADENNESS OF OBSERVATION

TIME AND PLACE: Tuesdays 16:00-18:00, 23.21/U1.68

Instructor: Dr. Ioannis Votsis

E-mail: votsis@phil-fak.uni-duesseldorf.de

Office hours (Room Geb. 23.21/04.86): Wednesdays 11:00-12:00

Theory-ladenness of observation is a central topic in the philosophy of science (and epistemology more generally). Roughly speaking, it is the idea that sensory experience, observation reports and empirical data are inadvertently imbued with theoretical prejudices. It presents a problem to the objectivity of knowledge by motivating the view that observations are not neutral adjudicators in the testing of theories. The aim of this course is to examine the merits, consequences and limits of some of the most important types of theory-ladenness. Among other things, we will be looking at how theory, broadly construed so as to include cognitive structures, determines which observations to perform and how it affects the formation of perceptions, the meaning of observational terms and the interpretation and assessment of empirical data.

General Surveys:

Brewer, W.F. and B.L. Lambert (2001) 'The Theory-Ladenness of Observation and the Theory-Ladenness of the Rest of the Scientific Process', *Philosophy of Science*, 68(3): S176-S186.

Kosso, P. (1992) *Reading the Book of Nature*, Cambridge: Cambridge University Press, ch. 6.

Coursework:

One presentation (to be assigned) on one of the essential readings. One essay to be handed in to the department by **03/07/07**. Suggested essay topics will be distributed nearer the deadline.

WEEK 1: Introduction, Presentation Assignments

WEEK 2: The Logical Positivist Conception of Observation and its Critics

Essential Reading:

Suppe, F. (1972) 'What's Wrong with the Received View on the Structure of Scientific Theories?', *Philosophy of Science*, vol. 39(1): 1-19.

Further Reading:

Carnap, R., (1928) *Der Logische Aufbau der Welt*, Berlin: : Schlachtensee Weltkreis-Verlag.

Putnam, H. (1962) 'What Theories Are Not', *Logic, Methodology and Philosophy of Science*, E. Nagel et al. (eds.), Stanford University Press, Stanford, pp. 240-251.

Ramsey, F. (1931) *Foundations of Mathematics*, New York: Humanities Press.

WEEK 3: The Myth of the Given

Essential Reading:

Sellars, W.F. (1997) *Empiricism and the Philosophy of Mind*, Cambridge: Harvard University Press, §1-7, 45-63.

Further Reading:

- Alston, W. P. (2002) 'Sellars and the "Myth of the Given"', *Philosophy and Phenomenological Research*, vol. 65, pp. 69-86.
- Brandt, R. (1997) 'Study Guide' in *Empiricism and the Philosophy of Mind*, Cambridge: Harvard University Press, pp. 119-181.
- Chisholm, R. (1964) 'The Myth of the Given', reprinted in *Epistemology: An Anthology*, J. Kim and E. Sosa (eds.), Oxford: Blackwell, 2000, pp. 107-119.

WEEK 4: Theory and Perception I

Essential Reading:

Hanson, N.R. (1958) *Patterns of Discovery*, Cambridge: Cambridge University Press, ch. 1.

Further Reading:

- Köhler, W. (1947) *Gestalt Psychology*, New York: Liverlight Publishing Corporation.
- Norman, A. (1998) Seeing, Semantics and Social Epistemic Practice, *Studies in History and Philosophy of Science*, vol. 29(4): 501–513.
- Popper, K.R. (1959) *The Logic of Scientific Discovery*, London: Hutchinson.

WEEK 5: Theory and Perception II

Essential Reading:

Fodor, J. (1984) 'Observation Reconsidered', *Philosophy of Science*, vol. 51(1): 23-43.

Further Reading:

- Henrich, J. and R. N. McCauley (2006) 'Susceptibility to the Muller-Lyer Illusion, Theory-Neutral Observation, and the Diachronic Penetrability of the Visual Input System', *Philosophical Psychology*, vol. 19(1): 79-101.
- Muller, V.C. and A. Raftopoulos (2006) 'The phenomenal content of experience', *Mind and Language*, vol. 21(2): 187-219.
- Raftopoulos, A. (2001) 'Reentrant Neural Pathways and the Theory-Ladenness of Perception', *Philosophy of Science*, vol. 68(3): S187-199.

WEEK 6: Theory and Perception III

Essential Reading:

Churchland, P.M. (1988) 'Perceptual Plasticity and Theoretical Neutrality: A Reply to Jerry Fodor', *Philosophy of Science*, vol. 55(2): 167-187.

Further Reading:

Feyerabend, P. K. (1969) 'Science Without Experience', *Journal of Philosophy*, vol. 66(22): 791-794.

- Fodor, J. (1988) 'A Reply to Churchland's "Perceptual Plasticity and Theoretical Neutrality"', *Philosophy of Science* 55(2):188-98.
- Pylyshyn, Z. (1999) 'Is Vision Continuous with Cognition? The Case for Cognitive Impenetrability of Visual Perception', *Behavioral and Brain Sciences*, vol. 22(3): 341-365.

WEEK 7: Holism

Essential Reading:

- Achinstein, P. (1964) 'On the Meaning of Scientific Terms', *Journal of Philosophy*, vol. 61(17): 497-509.

Further Reading:

- Feyerabend, P.K. (1963) 'How to Be a Good Empiricist – A Plea for Tolerance in Matters Epistemological', reprinted in *Philosophy of Science: The Central Issues*, M. Curd and J.A. Cover (eds.), New York: W.V. Norton & Company, 1998, pp. 922-949.
- Nagel, E. (1974) 'Issues in the Logic of Reductive Explanations', reprinted in *Philosophy of Science: The Central Issues*, M. Curd and J.A. Cover (eds.), New York: W.V. Norton & Company, 1998, pp. 905-921.
- Quine, W.V. (1953) 'Two Dogmas of Empiricism', reprinted in *From a Logical Point of View*, 2nd edition, Cambridge: Harvard University Press, 1980, pp. 20-46.

WEEK 8: Theoretical vs. Observational Language I

Essential Reading:

- Maxwell, G. (1962) 'The Ontological Status of Theoretical Entities', reprinted in Curd, M. and Cover, J.A. (eds.) *Philosophy of Science: The Central Issues*, New York: W.V. Norton & Company, 1998, pp. 1052-1063.

Further Reading:

- Carnap, R. (1956) 'The Methodological Character of Theoretical Concepts', *The Foundations of Science and the Concepts of Psychology and Psychoanalysis*, H. Feigl and M. Scriven (eds.), Minnesota Studies in the Philosophy of Science, vol. 1, Minneapolis: University of Minnesota Press.
- Lewis, D. (1970) 'How to Define Theoretical Terms', *Journal of Philosophy*, vol. 67(13): pp. 427-446.
- Quine, W.V. (1993) 'In Praise of Observation Sentences', *Journal of Philosophy*, vol. 90(3): 107-116.

WEEK 9: Theoretical vs. Observational Language II

Essential Reading:

- Musgrave, A. (1985) 'Realism versus Constructive Empiricism', reprinted in Curd, M. and Cover, J.A. (eds.) *Philosophy of Science: The Central Issues*, New York: W.V. Norton & Company, 1998, pp. 1094-1098.
- Van Fraassen, B. C. (1980) 'Arguments Concerning Scientific Realism', reprinted in Curd, M. and Cover, J.A. (eds.) *Philosophy of Science: The Central Issues*, New York: W.V. Norton & Company, 1998, pp. 1070-1075.

Further Reading:

- Alspector-Kelly, M. (2004) 'Seeing the Unobservable: Van Fraassen and the Limits of Experience', *Synthese*, vol. 140(3): 331-353.
- Churchland, P.M. (1985) 'The Ontological Status of the Observables: In Praise of the Superempirical Virtues', *Image of Science: Essays on Realism and Empiricism, with a Reply from Bas C. van Fraassen*, P. M. Churchland and C. A. Hooker (eds.), Chicago: University of Chicago Press, pp. 35-47.
- Hardcastle, V.G. (1994) 'The Image of Observables', *British Journal for the Philosophy of Science*, 45(2): 585-597.

WEEK 10: Observation and Experiment I**Essential Reading:**

- Hacking, I. (1985) 'Do We See Through A Microscope?', *Images of Science*, P.M. Churchland and C.A. Hooks (eds.), Chicago: University of Chicago Press, pp. 132-152.

Further Reading:

- Chalmers, A. (2003) 'The Theory-dependence of the Use of Instruments in Science', *Philosophy of Science*, vol. 70(3): 493-509.
- Franklin, A. (1997) 'Calibration', *Perspectives on Science*, vol. 5: 31-80.
- Rasmussen, N. (1993) 'Facts, Artifacts, and Mesosomes: Practicing Epistemology with the Electron Microscope', *Studies in History and Philosophy of Science*, vol. 24(2): 227-265.

WEEK 11: Observation and Experiment II**Essential Reading:**

- Shapere, D. (1982) 'The Concept of Observation in Science and Philosophy', *Philosophy of Science*, vol. 49(4): 485-525.

Further Reading:

- Heidelberger, M. (2003) 'Theory-Ladenness and Scientific Instruments in Experimentation', *The Philosophy of Scientific Experimentation*, Hans Radder (ed.), Pittsburgh: University of Pittsburgh Press, pp. 138-151.
- Hunt, S. D. (1994) 'A Realist Theory of Empirical Testing: "Resolving the Theory-Ladenness/Objectivity Debate"', *Philosophy of the Social Sciences*, vol. 24(2): 133-158.
- Linden, T. (1992) 'Shapere on Observation - Discussion', *Philosophy of Science*, vol. 59(2): 293-299.

WEEK 12: Observation and Experiment III**Essential Reading:**

- Franklin, A. (1994) 'How to Avoid the Experimenters' Regress', *Studies in History and Philosophy of Science*, vol. 25(3): 463-491.

Further Reading:

- Collins, H. (1985) *Changing Order: Replication and Induction in Scientific Practice*, London: Sage Publications, ch. 4.
- Hacking, I. (1999) *The Social Construction of What?*, Cambridge: Harvard University Press, ch. 3.
- Pickering, A. (1987) 'Against Correspondence: A Constructivist View of Experiment and the Real', *PSA 1986*, A. Fine and P. Machamer (eds.), vol. 2: 196-206.

WEEK 13: The Independence of Theories**Essential Reading:**

- Kosso, P. (1992) *Reading the Book of Nature*, Cambridge: Cambridge University Press, ch.9.

Further Reading:

- Brown, H.I. (1993) 'A Theory-Laden Observation Can Test the Theory', *British Journal for the Philosophy of Science*, vol. 44(3): 555-559.
- Franklin, A. et. al. (1989) 'Can a Theory-Laden Observation Test the Theory?', *British Journal for the Philosophy of Science*, vol. 40(2): 229-231.
- Hudson, R.G. (1994) 'Background Independence and the Causation of Observations', *Studies in History and Philosophy of Science*, vol. 25(4): 595-612.

WEEK 14: Observation and Evidence I**Essential Reading:**

- Basu, P. K. (2003) 'Theory-ladenness of Evidence: A Case Study from History of Chemistry', *Studies in History and Philosophy of Science*, vol. 34, 351-368.
- Votsis, I. (draft) 'Making Contact with Observations'

Further Reading:

- Bogen, J. and J. Woodward (1988) 'Saving the phenomena', *The Philosophical Review*, vol. 97, 303-352.
- Fodor, J. (1991) 'The Dogma that Didn't Bark (A Fragment of a Naturalized Epistemology)', *Mind*, C(398): 201-220.
- Woodward, J. (1989) 'Data and Phenomena', *Synthese*, vol. 79(3): 393-472.

WEEK 15: Observation and Evidence II**Essential Reading:**

- Kosso, P. (2006) 'Detecting Extrasolar Planets', *Studies in History and Philosophy of Science*, vol. 37(2): 224-236.

Further Reading:

- Azzouni, J. (2004) 'Theory, Observation and Scientific Realism', *British Journal for the Philosophy of Science*, vol. 55(3): 371-392.
- Hacking, I. (1989) 'Extragalactic Reality – The Case of Gravitational Lensing', *Philosophy of Science*, vol. 56(4): 555-581.
- Shapere, D. (1993) 'Astronomy and Antirealism', *Philosophy of Science*, vol. 60(1): 134-150.