

Arnon Levy

Curriculum Vitae

Department of Philosophy, Harvard University
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Education

Harvard University, Ph.D., philosophy, expected June 2010

Dissertation: IDEALIZATION, EXPLANATION AND FICTION

Committee: Peter Godfrey-Smith, Ned Hall, David Haig

Harvard University, M.Sc., organismic and evolutionary biology, expected June 2010

The Hebrew University of Jerusalem, 2003, B.Sc. *Magna cum Laude*, joint degree in philosophy and biology

Areas of Specialization

Philosophy of biology, philosophy of science

Areas of Competence

Moral & political philosophy, philosophy of mind, aesthetics: philosophy of literature

Publications

Research articles:

“Information in Biology: A Fictionalist Account”, forthcoming in *Noûs*

Book reviews:

“Review of Depth: an Account of Scientific Explanation by Michael Strevens”, forthcoming in *Biology & Philosophy*

“Explaining what? Review of Carl Craver’s Explaining the Brain,” *Biology & Philosophy* (2009), 24:137-145

“The organic codes: a review of Marcello Barbieri”, (co-authored with Eva Jablonka), *Acta Biotheoretica*, 52:1, March 2004

Awards, Honors, Fellowships

Bechtel Prize for best philosophy essay, Harvard University, 2008-09

Mind, Brain & Behavior Summer Research Award, Harvard University, summer 2009

Graduate Fellowship, The Edmond J. Safra Foundation Center for Ethics (project: Evolution & Morality), 2008-09

Mind, Brain & Behavior Graduate Student Term-Time Award, Harvard University, Spring 2008

GSAS Merit Fellowship, Harvard University, Fall 2007

Yedlin prize for excellence in the study of philosophy, Hebrew University, 2001

Presentations

“Internal Progress & Illusions of Understanding: Skyrms on the Evolution of Justice”
International Society for the History, Philosophy & Social Studies of Biology, Brisbane, Australia, July 2009

“On the Relevance of Evolutionary Game Theory to Political Philosophy”
Edmond J. Safra Foundation Center for Ethics Graduate Fellows Seminar, May 2009

“Idealization, Fiction & Causal Understanding” (Invited talk)
Models & Fiction, London School of Economics, London, UK, March 2009

“Idealization & Explanation in Models of the Evolution of Morality” (Invited talk)
Departmental colloquium, The department of History, Philosophy & Sociology of Science, The Hebrew University of Jerusalem, Israel, January 2009

“Idealization as Fiction”
Models & Simulations 2, Center for Logic & Philosophy of Science, Tilburg University, the Netherlands, October 2007

“Source-Driven Learning & the Evolution of Morality”
Philosophy of Biology at Dolphin Beach 2, Australian National University, August 2007

“Biological Information as an Explanatory Metaphor”
International Society for the History, Philosophy & Social Studies of Biology, Exeter, UK, July 2007

Teaching Experience

I have served as a teaching assistant in the following courses:

Philosophy of Science, Bernhard Nickel, Spring 2007, Harvard University

Introduction to Early Modern Philosophy, Alison Simmons, Spring 2006, Harvard University

Issues in Ethics, T.M. Scanlon, Fall 2005, Fall 2006 (Section Leader & Head TA), Harvard University

Philosophy of the Cognitive Sciences, Oron Shagrir, Fall 2001, Fall 2002, The Hebrew University of Jerusalem

Graduate Course work

(* indicates audited course)

Philosophy of Science & Biology:

Philosophy of Biology: Seminar (Peter Godfrey-Smith)

Evolution & Social Behavior: Seminar (Peter Godfrey-Smith)

Evolution & Cognition: Seminar (Peter Godfrey-Smith)*

Foundations of Evolutionary Theory: Seminar (Peter Godfrey-Smith & David Haig)*

Sociology of Science (Steven Shapin)*

What are the Odds? Reasoning probabilistically & Reasoning about Probability* (Ned Hall & Andrew Murray)*

Biology:

Modeling in Biology I: Differential Equations (Thomas Judson)

Modeling in Biology II: Linear Algebra & Probability (Clifford Tuabs)

Vertebrate Viviparity (David Haig)

Statistical Physics & Quantitative Biology (Howard Berg)

Microbial Diversity (Colleen Cavanaugh)

Population Biology (Daniel Hartl)*

Moral & Political Theory:

First Year Colloquium: Rationality & Practical Reasoning (T.M. Scanlon)

Political Philosophy: Rawls & his Critics (Niko Kolodny)

Kant's Ethical Theory (Christine Korsgaard)

History of Political Philosophy (Niko Kolodny)

Democracy: Seminar (Joshua Cohen & Amartya Sen)

Topics in Social Choice Theory (Kaushic Bassu & Amartya Sen)*

Epistemology & Language:

Belief, Trust & Testimony: Seminar (Richard Moran)

First Year Colloquium: Skepticism (Warren Goldfarb)

Intuitions & Philosophical Methodology: Seminar (Selim Berker)*

History of Philosophy:

Socrates: Pro-seminar (Raphael Wolff)

British Empiricism (Alison Simmons)

Wittgenstein's Later Philosophy (Warren Goldfarb)

Professional Service

Co-Organizer, workshop on models & metaphors in science, Harvard University, 2007-08

MBB Graduate Student Committee member, Harvard University, 2007-08, 2008-09

Co-Organizer the Philosophy Department colloquium, Harvard University, 2005–2006

Co-organizer of the 13th Annual Harvard/MIT Graduate Student Philosophy Conference, 2005

References:

Peter Godfrey-Smith
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David Haig
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Ned Hall
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Alison Simmons (teaching reference)
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T.M. Scanlon
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Dissertation Abstract

Idealization, Explanation & Fiction

It is natural to think that to explain a phenomenon is to provide information, true information, about why it happens. Scientific explanations, however, often take the form of idealized models: theoretical constructs that contain deliberate distortions (e.g. frictionless planes, infinite populations). Why is it that explanations in science commonly misrepresent the way things happen? More generally, how and when does idealization contribute to scientific understanding? I offer a general account of the role of idealization in explanation and provide several case studies from biology.

I set out by arguing for a two-dimensional conception of scientific explanation. On this conception the explanatory value of a model depends, first, on the causal information it contains – the extent to which it captures relevant causal factors. Second, a good explanation represents causal facts in a way that allows scientists to reason about the system being explained. The two dimensions interact and may trade off with one another. I argue that this view gains support from a prior (and plausible) notion of scientific understanding. Moreover, it combines two attractive ideas that have hitherto led separate lives: The idea that explanatory value depends on the character of the representational resources used in explanation, central to Kitcher’s unificationism; and the idea that good explanations track causal facts, currently dominant in the philosophy of science.

The two-dimensional conception nicely illuminates the role of idealization. I build on a recent account by Michael Strevens, on which an idealized model is explanatory when it does not misrepresent difference makers. I show that this is best understood as an account of the informational dimension of idealizing explanations. From the representational standpoint, idealization allows us to isolate causal factors and reason concretely. Drawing on Kendall Walton’s work on “make-believe”, I call attention to the connection between idealization and fiction. An idealized model’s engagement of the imagination may contribute to its representational, hence explanatory, value.

The second part of the dissertation consists of three case studies. These illustrate how idealization, and some kinds of fictional representation, contribute to scientific understanding. Yet they also show that idealization can lead theorists to overestimate explanatory value. The first case study concerns the Hodgkin-Huxley model of the action potential, a cornerstone of modern neurobiology. This is a best-case scenario for idealizing explanation. The analysis of a fictional “model neuron” – as H&H call it – is tightly coupled to the causal properties of squid axons as ascertained in the lab.

The next case study focuses on game theoretic models of the evolution of justice. Early in this project, individual-level acquisition of norms was idealized as a form of success seeking. I argue that follow-up work has refined the initial model, but has not sought to adjust it to the realities of moral learning. Here the focus on a compelling fictional set-up leads to an overestimation of the insights gained vis-à-vis real-world phenomena.

The final case study targets the concept of information in cellular and developmental biology. I argue that informational concepts are used in a figurative mode, much like metaphors. However, they play an important role in allowing biologists to compactly represent processes of control and regulation. Viewing biological information through the lens of idealization allows us to get a purchase on its explanatory value, but it also highlights its unusual theoretical role.