

Alkistis Elliott-Graves

Curriculum Vitae

University of Pennsylvania
Philosophy Department
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EDUCATION

PhD University of Pennsylvania, expected May 2014

DISSERTATION in Philosophy: Target Systems and their Role in Scientific Inquiry

COMMITTEE: Michael Weisberg (chair), Cristina Bicchieri, Zoltan Domotor,
Daniel J. Singer

AREAS OF SPECIALIZATION Philosophy of Biology (esp. Ecology), Philosophy of Science

AREAS OF COMPETENCE Philosophy of the Social Sciences, Early Modern Natural Philosophy

MSc London School of Economics and Political Science, 2008 (Distinction)

Dissertation in Philosophy of the Social Sciences: An Evolutionary Account of Human Reason

BA University College London, 2007 (1st Class Honors)

European Social and Political Studies, Area of Specialization: Philosophy, Language: Italian

Visiting Studentships

Australian National University, Summer 2009 and 2011, Philosophy Department

Scuola Normale Superiore di Pisa, Academic Year 2005-2006

JOURNAL ARTICLES

1. Elliott-Graves, A. & Weisberg, M. 'Idealization' (forthcoming at *Philosophy Compass*)
2. Elliott-Graves, A. 'What is a Target System?' (under review at *Philosophy of Science*)

CONFERENCE PRESENTATIONS

1. "What is the Target of a Generalized Model?" International Society for the History, Philosophy and Social Study of Biology 2013, Montpellier
2. "Abstract and Complete" Philosophy of Science Association Nov 2012, San Diego
3. "Targets of Population Ecology" Van Leer Institute, Mar 2012 Jerusalem

4. "Abstraction and Conceptualization in Invasive Species Research" International Society for the History, Philosophy and Social Study of Biology 2011, Salt Lake City
5. "Is Ecological Inheritance necessary for Niche Construction?" Integrating Complexity 2010, London Ontario
6. "Why early humans did not think deductively", International Society for the History, Philosophy and Social Study of Biology 2009, Brisbane

PAPERS IN PREPARATION

1. Elliott-Graves, A. 'Can there be a Unified Theory of Invasion Biology?'
2. Elliott-Graves, A. 'Abstract and Complete'

TEACHING

University of Pennsylvania

Primary Instructor: *Philosophy of Biology* (Spring 2013)
 Writing Seminar *Science and Human Nature* (Fall 2013, Spring 2014)

Teaching Assistant: *Introduction to Philosophy* (G. Riley & P. Riley, Fall 2009)
Philosophy of the Social Sciences (M. Weisberg, Spring 2010)
Philosophy of Mind (G. Purpura, Fall 2010)
Early Modern Philosophy (K. Detlefsen, Spring 2011)

SERVICE

Reviewer British Journal for the Philosophy of Science
 Philosophy of Science Association (Journal)
 Biology and Philosophy

Conference Organiser Philosophy of Biology on Dolphin Beach, Canberra/Moruya, Australia (July 2011)

Graduate Representative University of Pennsylvania, Department of Philosophy (Sep 2011 - Aug 2012)

Graduate Assistant University of Pennsylvania, Fisher Hassenfeld College House (Aug 2008 - May 2009)

GRANTS AND AWARDS

University of Pennsylvania Critical Writing Fellowship (2013-2014)
George W. M. Bacon Fellowship (2012-2013)
Benjamin Franklin Fellowship (2008-2012)

University College London Exchange Program Scholarship (2005-2006)
& Scuola Normale Superiore
di Pisa

REFERENCES

Michael Weisberg	weisberg@phil.upenn.edu	+1 215 898 0417
Cristina Bicchieri	cb36@sas.upenn.edu	+1 215 898 5820
Kim Sterelny	kim.sterelny@anu.edu.au	+61 2 6125 2886
Elisabeth Camp	elisabeth.camp@rutgers.edu	+1 848 932 0404
Karen Detlefsen (teaching)	detlefse@phil.upenn.edu	+1 215 898 5560

GRADUATE COURSES ATTENDED (audits demarcated with *)

History & Philosophy of Science: Phil 525: Topics in Philosophy of Biology (Weisberg, Spring 2010)
Phil 699: Scientific Explanation (Weisberg, Spring 2010)
Phil 521: Philosophy of Biology (Weisberg, Spring 2009)
HSSC 535: Biology in the last Century (Adams, Fall 2009)

Biology: Biol 423: Plant Ecology (Casper, Spring 2012)*
Biol 410: Advanced Evolution (Plotkin/Sniegowski, Fall 2011)*
Biol 414: Advanced Ecology (Casper/Petratis, Fall 2010)

General Philosophy: Phil 405: Philosophy of Language (Camp, Spring 2009)
Phil 525: Experiments in Ethics (Bicchieri, Spring 2009)
Phil 505: Logic (Weinstein, Spring 2009)
Phil 600: Proseminar (Epistemology) (Weisberg, Fall 2008)

History of Philosophy: Phil 547: British Natural Philosophy (Detlefsen, Spring 2010)
Phil 479: Modern Political (Freeman, Fall 2009)
Phil 464: 18th Century British Moralists (Guyer, Fall 2008)
Phil 509: Middle Plato (Kahn, Fall 2008)

DISSERTATION ABSTRACT

Scientists often construct simplified and idealized models in order to study complex phenomena. Yet they do not model a phenomenon in its entirety but *target* only the aspects of the phenomenon which they consider relevant. Hence, the model is said to describe the *target system* and not the whole phenomenon. The term ‘target system’ has become popular in the philosophy of science, yet most authors do not provide a definition or analysis of the concept. The result is that the term is used ambiguously, which has undermined its potential value and usefulness for scientific practice. The aim of this dissertation is to provide a cogent account of target systems and their importance in science, with examples taken from case studies in ecology.

The central issue I explore in my dissertation concerns the nature of target systems. What are target systems? How are they specified? How can they be evaluated? There are three options for what target systems could be. The first is that they are real systems and stand in a part-whole relationship to systems in the world. The second is that they are models and represent systems in the world. The third option is that targets are imaginary systems which are described by idealized models. I argue that the first option is correct. It is the only one that makes sense of target systems and their role in model-world relations. Targets are specified through a process of partitioning and abstraction, neither of which change the ontological nature of a system in the world.

To have a full understanding of target systems, we must also understand how to evaluate them. As targets are not idealized models, but real parts of the world, the methods we use for evaluating models, such as isomorphism and similarity, will not apply to targets. I propose an alternative method of evaluation based on the notion of *aptness*. An apt target system is characterized by a useful partition of the natural phenomenon and the right level of abstraction, one where all the irrelevant factors have been omitted but none of the relevant ones.

My view of target systems points to an important debate in general philosophy of science, concerning the relationship between abstraction and idealization. Most philosophers of science think that abstraction and idealization amount to the same thing. I join the dissenters who think that abstraction is distinct from idealization, as it is a process of omission and not distortion. Target systems are an important example of a system which is abstract but not idealized.

A deep understanding of nature and function of targets can resolve problems in science. I use the term ‘target system analysis’, to denote the specification of target systems of one enquiry and the comparison of targets across enquiries. For example, invasive species research is a relatively new field in biology, which is characterized by a multitude of different approaches. According to the scientists themselves, this diversity is problematic because it results in failure to predict invasions. To remedy this, a number of papers have recently been published calling for integration of the approaches in invasion biology. Target system analysis offers a diagnosis of the situation. It reveals that a scientist constructing a unificatory framework in invasion biology faces a tradeoff between generality and predictability. A truly unified framework must incorporate a multitude of different causes of invasion, yet the causes of each invasion are unique. Hence, invasion biology can have a unified theory, based on the *process* of invasion, yet this theory will be of little use to predicting particular invasions.