Tamar Lando

Curriculum Vitae

Department of Philosophy
University of California, Berkeley
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Education

Ph.D. Philosophy:	University of California, Berkeley. Expected: December, 2011.
M.A. Mathematics:	University of California, Berkeley, May, 2008.
B.A. Philosophy:	Stanford University, June, 2002.

Areas of Specialization

Logic, Epistemology

Areas of Competence

Philosophy of Photography, Philosophical Logic.

Dissertation

'Probabilistic Semantics for Modal Logic'

The dissertation explores a new probabilistic semantics for modal logic. Under this semantics, formulae are not simply true or false for a given model, but take on a probability value between 0 and 1. I show how this semantics can be defined for different propositional modal logics, and prove the first completeness results in this area. This formal framework can be used in the ever-growing range of philosophical projects that exploit probability theory for philosophical insights.

Committee: Paolo Mancosu and Barry Stroud (co-chairs)
Christos Papadimitriou (Department of Computer Science)

Publications and Submitted Papers

- 'Completeness of S4 for the Lebesgue Measure Algebra.' (2010) *Journal of Philosophical Logic*.
- 'Dynamic Measure Logic.' Forthcoming in *Annals of Pure and Applied Logic*.
- 'Fractal Completeness Techniques in Topological Modal Logic.' Co-authored with Darko Sarenac. Under Review.

Presentations (Past and Forthcoming)

'Epistemic Luck,' UC Berkeley Philosophy Colloquium	December 2011
'Probability and Modality,' UC Irvine Philosophy Colloquium	November 2011

'Probability and Modality,' Stanford University Logic Seminar	November 2011
'Interpreting dynamic topological logic in the Lebesgue measure algebra,' EBL 2011 Brazilian Logic Conference	May 2011
'Conclusive Reasons,' UC Berkeley, London-Berkeley Graduate Philosophy Conference	May 2011
'Completeness of S4 for the Lebesgue measure algebra,' UNILOG 2011 - World Congress on Universal Logic in Lisbon, Portugal	April 2010
'Fractals, Topology and Logic,' UNILOG 2011 School in Lisbon, Portugal	April 2010
'Completeness of S4 for the Lebesgue Measure Algebra,' Massachusetts Institute of Technology (MIT) Logic Seminar	April 2010

Languages

Hebrew (Fluent); French (Advanced)

Teaching Experience

As a teaching assistant, I had various roles in a range of classes, teaching groups of 10-20 students; working closely with individual students on proofs; and working closely with individual students on their philosophical writing. I also helped prepare exams in logic classes, and led review sessions on the course material.

Teaching Assistant, UC Berkeley

Form and Meaning	Fall 2011	Seth Yalcin
Introduction to Logic	Spring 2011, Fall 2009, Spring 2007 & Fall 2005	Paolo Mancosu
Introduction to Logic	Fall 2010	Sherrilyn Roush
Introduction to Logic	Spring 2010, Fall 2008 & Fall 2006	Branden Fitelson
Hume	Summer 2009	Josef Moural
Introduction to Logic	Spring 2009 & Spring 2006	Daniel Warren

Teaching Assistant, Stanford University

Logic, Reasoning and Argumentation	Winter 2003	Scott Tanona
God, Self and World: An Introduction to Philosophy	Fall 2002	Simon May
Photography II	Summer 2002	
Logic, Reasoning and Argumentation	Fall 2002	Ban Escoto

Other Employment

Freelance Journalist for LA Weekly and Mother Jones Magazine (June 2003 - December 2004)
Intern for The Nation magazine (January 2004 - May 2004)

Selected Publications Include:

'Hellraiser: Pocket Protector,' *Mother Jones Magazine*, May/June 2005 Issue
'Union Triage,' *LA Weekly*, October 2003

Honors and Awards

Graduate Division Summer Grant	UC Berkeley Graduate Division May 2011
Graduate Student Travel Award	Association of Symbolic Logic May 2011
UC Berkeley Dissertation-Year Fellowship Nomination	UC Berkeley Department of Philosophy January 2011
Graduate Division Summer Grant	UC Berkeley Graduate Division May 2010
Conference Travel Grant	UC Berkeley Graduate Division April 2010
Dean's Normative Time Fellowship	UC Berkeley Graduate Division Academic Year 2008-2009
UC Berkeley Ralph W. Church Fellowship	UC Berkeley Department of Philosophy Academic Year 2004-2005
Stanford University President's Scholar	Stanford University 1997-2002

Graduate Courses (* = audited)

Philosophy

Hume	Barry Stroud
Intermediate Logic I (Model Theory)	Branden Fitelson
Intermediate Logic II (Recursion Theory)	Paolo Mancosu
Introduction to Set Theory	Grigori Mints
Plato	Alan Code
Philosophy of Mind	John Searle
First Year Graduate Seminar	Barry Stroud & John Campbell
Metaphysics, Modality and Value	Barry Stroud
Practical Necessities	Jay Wallace
Expressivism and Relativism*	John MacFarlane
Contemporary Debates in Epistemology*	Branden Fitelson
Logic, Formal Methods and Epistemology*	Branden Fitelson
Philosophy of Language: Perspective in Language*	Seth Yalcin

Mathematics

Introduction to Analysis	Alexander Givental

Abstract Algebra	Martin Weissman
Topology and Analysis	Justin Holmer
Advanced Introduction to Probability	Sourav Chatterjee
Probability for Applications	David Aldous
Combinatorics	Joshua Sussan
Elementary Algebraic Topology	Mauricio Velasco
Complex Analysis	Michael Rose
Measure Theory*	Marina Ratner
Incompleteness and Undecidability*	John Steel

References

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Dissertation Abstract

The power and flexibility of modal logic lie in its ability to systematize reasoning about a host of modal notions. Modalities may come from natural language, mathematics, or from a variety of applied problems. But however we interpret modal symbols, the following is bedrock: formulas (or sentences) in the modal language are either *true* or *false* for a given modal model. What if instead we allowed formulas to acquire a *probability* value between 0 and 1—if, that is, we interpreted formulas probabilistically? In recent years, Dana Scott introduced a 'probabilistic semantics' for modal logic. My dissertation develops the formal groundwork for this semantics, proves the first completeness results in this area, and extends the semantics to more complex modal languages. This work makes available rich formal tools that can be exploited in the ever-growing range of philosophical projects that rely on probability theory for philosophical insights.

The language of classical propositional logic, consisting of propositional symbols and Boolean connectives $(\&, \vee, \neg)$ is widely familiar. In propositional modal logic, we enrich this language with new 'modal' symbols (typically, $\Box$ and $\Diamond$). In the most familiar interpretation, these symbols are taken to express 'necessity' and 'possibility,' and are interpreted in standard Kripke frames. But since the time of Alfred Tarski, it has been known that the basic propositional modal language can also be interpreted 'spatially,' in topological spaces. In 1944, Tarski proved that under the 'topological semantics,' the modal logic S4 is sound and complete for the real line. That result, which has received much renewed attention in recent years, stands at the foundations of the contemporary project of analyzing space by means of modal logic. But Tarski's proof was notoriously complex. In the first chapter of my dissertation, I show that the Tarski Theorem can be proved in a much simplified way, via simple and well-known fractal curves.

In the second chapter of the dissertation, I go on to show how the probabilistic semantics for modal logic can be developed in a natural way out of Tarski's (non-probabilistic) topological semantics. In this chapter, I prove the first completeness result for the probabilistic semantics. In particular, I show that the modal logic S4 is sound and complete for the Lebesgue measure algebra—or algebra of Lebesgue-measurable subsets of the real interval $[0, 1]$, modulo sets of measure zero. (*Journal of Philosophical Logic*, 2010.) At the time I began work on this project, no formal results had yet been obtained: in particular, it was not known whether the probabilistic semantics was axiomatizable. In the third chapter of the dissertation, I go on to show that we can give a probabilistic semantics not just for the *basic* modal language, but for more complex, multi-modal languages. I focus in particular, on a family of 'dynamic topological logics' which have been at the heart of a research program aimed at using logic to study 'dynamic space' (space that changes over time). Again I prove that the basic 'dynamic topological logic,' S4C, is sound and complete for the probabilistic semantics. (Under review at *Annals of Pure and Applied Logic*.)

This work opens up many interesting philosophical avenues. One promising direction is the use of the probabilistic semantics for modeling various aspects of an agent's epistemic states. In Bayesian epistemology, for example, we view agents as attaching certain probabilities to propositions in their language: we speak of credences rather than truth assignments. The probabilistic semantics provides a framework for modeling these credences by mapping propositions onto measurable subsets of the real line. Moreover, this mathematical framework seems to be particularly well-suited to model the *dependencies* between an agent's different beliefs. Although you and I may assign the same probabilities to different propositions or formulas, we may yet be in very different epistemic states in virtue of accepting different relations of consequence or support among propositions. No other standard semantics for the modal language has this 'probabilistic' feature.

Description of Further Research

In addition to the project on probabilistic modal logic pursued in my dissertation, I also have a project in epistemology, focused on the conditions for knowledge and the possibility of 'epistemic luck.'

Gettier's counterexamples to the justified-true-belief account of knowledge have prompted a range of attempts to say what knowledge is, if it's not justified true belief. One way to understand those examples is as follows. One can have a justified true belief that P, and yet get things right about P only as a matter of luck. Given that one does not *know* what one gets right only as a matter of luck, justified true belief is not sufficient for knowledge. I argue that the Gettier cases force us to focus on the question of epistemic luck, and that this has important consequences for any adequate conditions on knowledge. In particular, the need to rule out this kind of luck shows the insufficiency of various modal constraints on what we would have believed under different circumstances.

The first part of this project focuses on reasons-based knowledge. I begin with the view that a reason R is conclusive for P just in case [R would not be the case unless P were the case]. This view was famously defended by Dretske in his paper 'Conclusive Reasons.' I show that we can construct simple cases in which an agent believes P on the basis of a reason that satisfies this condition, but in which the agent is still *lucky* in believing the truth about P. Given the incompatibility of knowledge and epistemic luck, the agent in these examples does not *know* that P is the case. The examples show, as I argue, that while knowing may be a matter of having conclusive reason to believe, what it is to have conclusive reason for P cannot be understood in terms of whether one's stated reason for P satisfies the external modal constraint that Dretske advances. The explanation for this is, in my view, straightforward: satisfying this modal constraint cannot guarantee the kind of *epistemic competence* that we demand of putative knowers. In particular, it cannot guarantee that the agent is able to rule out any given set of alternatives to what she believes.

In the second part of my project, I turn to a closer investigation of what exactly luck, or epistemic luck, is. The motivation here lies in the thought that if knowledge is incompatible with the pernicious kind of epistemic luck, then understanding what luck is might help us to understand what knowledge is. My paper, 'What is (epistemic) luck,' has both a negative and a positive component. On the negative side, I argue against the two most prominent accounts of luck in the recent literature. Of particular interest here is Duncan Pritchard's modal account, according to which an event is lucky if it is significant to the agent concerned and is 'modally rare' (or occurs in the actual world but not in many nearby possible worlds). For Pritchard, ruling out epistemic luck is *tantamount to* adopting a 'safety' condition on knowledge. I argue that his account fails for the same sort of reasons that I advance against the modal account of conclusive reasons.

On the positive side, I advance a new theory of luck, which does a better job of capturing our ordinary intuitions in a wide range of cases. According to this account, luck is sensitive not just to the way in which a given event is brought about—whether by modally robust processes, or modally rare ones—but also to whether the agent concerned *exploits* those circumstances that do bring it about. Very roughly: S is lucky in achieving A only if A is not brought about by circumstances successfully exploited for the purpose of A, or by actions successfully directed at the achievement of A. It follows that a person can fail to know that P if, in believing that P, she does not take into account those circumstances that bring about P. I argue that this new account helps us to understand cases of epistemic luck familiar from the Gettier and post-Gettier literature.