

Curriculum Vitae

Personal Information

- Name:
David Elohim
My name was Hasen Joseph Khudairi, from January, 1986, to March, 2023, and Timothy Alison Bowen, from March, 2023, to April, 2024.
Please cite my published book and papers under ‘Elohim, David’.
- Date of Birth:
January 16, 1986
- Languages:
English (Native)
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Education

- Ph.D. Student, Philosophy. Arché Philosophical Research Centre for Logic, Language, Metaphysics, and Epistemology, University of St Andrews. (2014-2017) [withdrew, owing to illness]

Research Groups

Models, Modality, and Meaning (2014-2015)

Arché Logic Group (2014-2017)

History and Philosophy of Logic and Mathematics (2015-2017; Convener for the group in the Fall 2016 semester)

Metaphysics (2014-2017)

- Visiting Ph.D. Student, Philosophy. Australian National University. (2017) [declined, owing to illness]
- M.A., Philosophy. Columbia University. (2010-2012)
- B.A. (Hons.), Philosophy. Johns Hopkins University. (2005-2008)

Teaching

- Tutor (Teaching Assistant). ‘Reasoning’, i.e. introduction to logic, University of St Andrews. (2016)
Responsibilities included teaching two discussion sections, grading exams, and meeting with students during office hours.
- Reader in Philosophy (Teaching Assistant). ‘Plato’, Columbia University. (2011)
Responsibilities included grading papers and meeting with students during office hours.

Research Interests

Areas of Specialization:

- Mathematical and Philosophical Logic (set theory; philosophical applications of (i) modal logic, especially modal algebra, coalgebra, and the modal μ -calculus (ii) dynamic epistemic logic, (iii) hyperintensional semantics, and (iv) two-dimensional semantics)
- Philosophy of Mathematics (modality and hyperintensionality in mathematics; set theory; category theory; homotopy type theory; mathematical practice)
- Epistemology (epistemic logic and epistemic modal and hyperintensional semantics; modal epistemology; epistemology of mathematics; conceivability; the apriori)
- Metaphysics (modal ontology; mathematical objects; consciousness; grounding; hyperintensionality)
- Philosophy of Mind (consciousness; mental representation; the language of thought)

Areas of Competence:

- Philosophical Linguistics
- Cognitive Science
- Ethics
- Feminist Philosophy

Publications

- *Epistemic Modality and Hyperintensionality in Mathematics*. 2024. Ph.D. Dissertation, Arché, University of St Andrews, UK. Amazon.
- Hyperintensional Ω -Logic. 2019. In M.V. d’Alfonso and D. Berkich (eds.), *The Cognitive, Ethical, and Scientific Dimensions of Artificial Intelligence – Themes from IACAP 2016*. Springer.
- Grounding, Conceivability, and the Mind-Body Problem. 2018. *Synthese* 195 (2):919-926, doi:10.1007/s11229-016-1254-2. Correction: *Synthese*, 200 (2).

Dissertation Abstract

This dissertation concerns the foundations of epistemic modality and hyperintensionality and their applications to the philosophy of mathematics. I examine the nature of epistemic modality, when the modal operator is interpreted as concerning both apriority and conceivability, as well as states of knowledge and belief. The dissertation demonstrates how epistemic modality and hyperintensionality relate to the computational theory of mind; metaphysical modality and hyperintensionality; the types of mathematical modality and hyperintensionality; to the epistemic status of large cardinal axioms, undecidable propositions, and abstraction principles in the philosophy of mathematics; to the modal and hyperintensional profiles of the logic of rational intuition; and to the types of intention, when the latter is interpreted as a hyperintensional mental state. Chapter **2** argues for a novel type of expressivism based on the duality between the categories of coalgebras and algebras, and argues that the duality permits of the reconciliation between modal cognitivism and modal expressivism. I also develop a novel topic-sensitive truthmaker semantics for dynamic epistemic logic, and develop a novel dynamic two-dimensional semantics. Chapter **3** provides an abstraction principle for epistemic (hyper-)intensions. Chapter **4** advances a topic-sensitive two-dimensional truthmaker semantics, and provides three novel interpretations of the framework along with the epistemic and metasemantic. Chapter **5** applies the fixed points of the modal μ -calculus in order to account for the iteration of epistemic states in a single agent, by contrast to availing of modal axiom 4 (i.e. the KK principle). The fixed point operators in the modal μ -calculus are rendered hyperintensional, which yields the first hyperintensional

construal of the modal μ -calculus in the literature and the first application of the calculus to the iteration of epistemic states in a single agent instead of the common knowledge of a group of agents. Chapter **6** advances a solution to the Julius Caesar problem based on Fine's 'criterial' identity conditions which incorporate conditions on essentiality and grounding. Chapter **7** provides a ground-theoretic regimentation of the proposals in the metaphysics of consciousness and examines its bearing on the two-dimensional conceivability argument against physicalism. The topic-sensitive epistemic two-dimensional truthmaker semantics developed in chapters **2** and **4** are availed of in order for epistemic states to be a guide to metaphysical states in the hyperintensional setting.

Chapters **8-12** provide cases demonstrating how the two-dimensional hyperintensions of hyperintensional, i.e. topic-sensitive epistemic two-dimensional truthmaker, semantics, solve the access problem in the epistemology of mathematics. Chapter **8** examines the interaction between my hyperintensional semantics and the axioms of epistemic set theory, large cardinal axioms, the Epistemic Church-Turing Thesis, the modal axioms governing the modal profile of Ω -logic, Orey sentences such as the Generalized Continuum Hypothesis, and absolute decidability. These results yield inter alia the first hyperintensional Epistemic Church-Turing Thesis and hyperintensional epistemic set theories in the literature. Chapter **9** examines the modal and hyperintensional commitments of abstractionism, in particular necessitism, and epistemic hyperintensionality, epistemic utility theory, and the epistemology of abstraction. I countenance a hyperintensional semantics for novel epistemic abstractionist modalities. I suggest, too, that observational type theory can be applied to first-order abstraction principles in order to make first-order abstraction principles recursively enumerable, i.e. Turing machine computable, and that the truth of the first-order abstraction principle for hyperintensions is grounded in its being possibly recursively enumerable and the machine being physically implementable. Chapter **10** examines the philosophical significance of hyperintensional Ω -logic in set theory and discusses the hyperintensionality of metamathematics. Chapter **11** provides a modal logic for rational intuition and provides a hyperintensional semantics. Chapter **12** avails of modal coalgebras to interpret the defining properties of indefinite extensibility, and avails of hyperintensional epistemic two-dimensional semantics in order to account for the interaction between the interpretational and objective modalities and truthmakers thereof. This yields the first hyperintensional category theory in the literature. I invent a new mathematical trick in which first order structures are treated as categories, and Vopenka's principle can be satisfied because of the elementary embeddings between the categories and generate Vopenka cardinals while bypassing the category of Set in category theory. Chapter **13** examines modal responses to the alethic paradoxes. Chapter **14** examines, finally, the modal and hyperintensional semantics for the different types of intention and the relation of the latter to evidential decision theory.

Work in Progress

- A book-length defense of epistemic democracy.

Awards and Honors

- St Leonard's College Ph.D. Research Scholarship. University of St Andrews, 2014-2017.
- Departmental Honors in Philosophy. Johns Hopkins University, 2008.
- University Honors. Johns Hopkins University, 2008.

Graduate and Undergraduate Philosophy Seminars in which I earned an 'A'

Graduate

- A, Theory of Knowledge, Johns Hopkins University
- A, Quodlibetal Studies: Philosophy of Perception, Columbia University
- A, Topics in Moral Philosophy, Columbia
- A, Quodlibetal Studies: Hegel, Columbia
- A, Topics in Ancient Philosophy: Relativism and Skepticism, Columbia
- A, Topics in Esthetics and Criticism, Johns Hopkins
- A+, Secularism and Beyond, Johns Hopkins
- A+, The Secular Lives of Grace, Johns Hopkins
- A-, Philosophy of Mind: Self-Knowledge, Columbia

Undergraduate

- A, Intro to Symbolic Logic, Brandeis University
- A, Philosophy of Language II, Johns Hopkins
- A, Wittgenstein, Johns Hopkins
- A, Radical Enlightenment: Spinoza, Johns Hopkins
- A, Philosophy Honors Project II, Johns Hopkins
- A-, Philosophy Honors Project I, Johns Hopkins
- A-, Directed Study, Johns Hopkins
- A-, Plato and his Predecessors, Johns Hopkins

Research Presentations

- 'Imagination and Knowledge of Necessary Existence'. *Evidence and Imagination*, University of Graz, November 2016. (Peer-Reviewed) [declined, owing to illness]
- 'Fritz and Goodman on Counting Impossibles'. Arché Research Group in *History and Philosophy of Logic and Mathematics*, November, 2016.

- ‘Modal Cognitivism and Modal Expressivism’. *History and Philosophy of Logic and Mathematics*, Arché, October 2016.
- ‘Koslicki on Fine’s Theory of Embodiments’. *Metaphysics: Identity, Existence, and Structure* Research Group, Arché, October, 2016.
- ‘Grothendieck Universes and Indefinite Extensibility’. Salzburg Conference for Young Analytic Philosophy, University of Salzburg, September 2016. (Peer-Reviewed) [declined, owing to illness]
- ‘Imagination and Knowledge of Necessary Existence’. *The Logics of Image*, International Symmetry Society Congress (Santorini, Greece), July 2016. (Peer-Reviewed)
- ‘Grounding, Conceivability, and the Mind-Body Problem’. *Grounding and Consciousness*, University of Birmingham, June 2016. (Peer-Reviewed)
- ‘Modal Ω -Logic: Automata, Neo-Logicism, and Set-Theoretic Realism’. International Association for Computing and Philosophy – Annual Meeting, University of Ferrara, June 2016. (Peer-Reviewed)
- ‘Goodness and Moral Obligation’. *Kant, Metaethics, and Value*, Trinity College Dublin, May 2016. (Peer-Reviewed)
- ‘Grounding, Conceivability, and the Mind-Body Problem’. *The Science of Consciousness*, University of Arizona, April 2016. (Peer-Reviewed)
- ‘Logical and Epistemic Modality’. Postgraduate Friday Seminar, Departments of Logic and Metaphysics and of Moral Philosophy, University of St Andrews, April 2016.
- ‘Algebraic Metaphysical Semantics’. Uehiro Graduate Philosophy Conference, University of Hawaii at Manoa, March 2016. (Peer-Reviewed)
- ‘Grounding and Fundamentality’. *Metaphysics: Identity, Existence, and Structure*, Arché, November 2015.
- ‘Rules and Evolution’ and ‘Inference in Logic’. *History and Philosophy of Logic and Mathematics*, Arché, October 2015.
- ‘Modal Saturations via Ultrafilter Extensions’. Arché Logic Group, May 2015.
- ‘Grounding beyond the Image of Causation’. *Metaphysics: Identity, Existence, and Structure*, Arché, April 2015.
- ‘Bisimulations’. Arché Logic Group, April 2015.

- ‘Bayesian Apriority’. *Models, Modality, and Meaning* Research Group, Arché, December 2014.
- ‘Consciousness, Haecceitism, and Grounding’. *Metaphysics: Identity, Existence, and Structure*, Arché, November 2014.
- ‘Haecceitism, Chance, and Counterfactuals’. *Metaphysics: Identity, Existence, and Structure*, Arché, November 2014.
- ‘On Oliver and Smiley’s Mid-plural Logic’. Arché Logic Group, November 2014.
- ‘On Gradational Accuracy Measures for 4-valued Logic’. Arché Graduate Conference, November 2014.
- ‘On Scharp’s Resolution to the Alethic Paradoxes’. *Models, Modality, and Meaning*, Arché, October 2014.
- ‘Imagination and Knowledge of Necessary Existence’. Postgraduate Friday Seminar, University of St Andrews, October 2014.
- ‘On Second-order Logic and Mathematics’. Arché Logic Group, October 2014.

Service

- Co-Organizer, Funding Coordinator, and Referee. 9th Annual Arché Graduate Conference (2016). Keynotes: Fiona Macpherson (Glasgow) and Jenny Saul (Waterloo).
- Referee. 8th Annual Arché Graduate Conference (2014).
- Referee. The Columbia/NYU Graduate Conference in Philosophy (2012).

References

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