Travis LaCroix | Curriculum Vitae

Contact Information

740 Social Science Tower
University of California, Irvine
Department of Logic and Philosophy of Science
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Citizenship Canada

Education

University of California, Irvine, Irvine, California USA
Ph.D, Philosophy, June 2020 (Expected). GPA: 3.97/4.00
Department of Logic and Philosophy of Science

Dissertation: "Complex Signals: Modularity, Reflexivity, & Hierarchical Structure"
Committee: Jeffrey Barrett (Chair)
Brian Skyrms
Simon Huttegger
Cailin O'Connor

M.A., Social Science, March 2018
Institute for Mathematical Behavioral Science

Simon Fraser University, Burnaby, British Columbia CAN
M.A., Philosophy, April 2016. GPA: 4.05/4.33

Thesis Topic: "On Signaling Games and Their Models"
Committee: Nicolas Fillion (Chair)
Matt DeVos

University of British Columbia, Vancouver, British Columbia CAN
B.A. (Hons.), Philosophy; English Literature, April 2014. GPA: 81.5/100

First-class standing

Camosun College, Victoria, British Columbia CAN
A.A., English, April 2011. GPA: 8.14/9

Appointments

Mila (Québec Artificial Intelligence Institute), Montréal, Québec CAN
Visiting Researcher / Research Assistant, July 2018 – June 2020

Supervisor: Yoshua Bengio

Publications

Refereed Journal Articles

2. LaCroix, Travis. 2019. "Evolutionary Explanations of Simple Communication: Signalling Games & Their Models." *Journal for General Philosophy of Science / Zeitschrift für allgemeine Wissenschaftstheorie* (Forthcoming).

1. LaCroix, Travis. 2018. "On Salience and Signaling in Sender-Receiver Games: Partial Pooling, Learning, and Focal Points." *Synthese* (Forthcoming). doi.org/10.1007/s11229-018-1766-z

Articles

Papers Under Review

(Draft available upon request)

"Polysemy, Role Asymmetry & the Evolution of Compositional Signals"
"(Apparent) Coincidences and the Grain of Explanation"
"Communicative Bottlenecks Lead to Maximal Information Transfer"
"The Correction Game"
"Epistemology and the Structure of Language" (w/ J. A. Barrett)
"Power by Association" (w/ C. O'Connor)
"Self-Assembly and Logical Operations" (*R&R Decision*)
"What Russell Can Denote"

Selected Working Papers

(Draft available upon request)

"The Dynamics of Retraction in Epistemic Networks" (w/ C. O'Connor & A. Geil)
"Less is More: Degrees of Compositionality for Complex Signals"
"Reference by Proxy and Truth-in-a-Model"
"Saltationism v. Gradualism"
"Selfish Emergent Communication" (w/ M. Noukhovitch, A. Lazaridou, A. Courville)
"Learning from Learning Machines" (w/ Y. Bengio)

Popular Media

1. "Academics Have a Responsibility to Distribute Accurate Data." (Published as "It's not a woman's world just yet.") *Ottawa Citizen* (November 6, 2017).

Conference Presentations

Refereed Talks

2019

13. "Accounting For Role-Asymmetries In the Evolution of Compositional Signals"
Canadian Philosophical Association
Vancouver, Canada, 1–4 June 2019.

12. "Using Logic to Evolve More Logic: Composing Logical Operators via Self-Assembly"
Society for Exact Philosophy
Toronto, Canada, 17–19 May 2019.

11. "Using Logic to Evolve More Logic: Composing Logical Operators via Self-Assembly"
American Philosophical Association, Pacific Division
Vancouver, Canada, 17–20 April 2019.

2018

10. "Less is More: Degrees of Compositionality for Complex Signals"
Philosophy of Science Association
Seattle, USA, 1–4 November 2018. *Symposium Contribution.*

9. "Reference by Proxy and Truth-in-a-Model"
Western Canadian Philosophical Association
Calgary, Canada, 26–28 October 2018.

8. "On The Role of Power in the Evolution of Inequitable Norms" (w/Cailin O'Connor)
   L'Association Canadienne de Philosophie
   Montréal, Québec, 4–7 June 2018.

7. "On The Role of Power in the Evolution of Inequitable Norms" (w/Cailin O'Connor)
   Latin American Association for Analytic Philosophy, and
   Colombian Conference on Logic, Epistemology, and Philosophy of Science
   Villa de Leyva, Colombia, 16–18 May 2018.

6. "On The Role of Information in the Evolution of Signaling"
   University of Calgary Graduate Philosophy Conference
   Calgary, Canada, 3–4 May 2018.

2017

5. "On Salience and Signaling in Sender-Receiver Games"
   Western Canadian Philosophical Association
   Regina, Canada, 13–15 October 2017.

4. "Evolving Salience in Sender-Receiver Games"
   Luce Graduate Student Conference
   Irvine, USA, 2 June 2017.

2016

3. "Signaling Games & Their Models"
   Colombian Conference on Logic, Epistemology, & Philosophy of Science
   Bogotá, Colombia, 17–19 February 2016.

2015

2. "Fractionally Quantified Predicate Logic"
   Logic, Math and Physics Graduate Student Conference
   London, Canada, 4–5 June 2015.

2014

1. "The Metaphysics of Philosophical Objects and their Methodological Implications"
   Canadian Undergraduate Philosophy Conference
   Calgary, Canada, 7–9 February 2014.

Departmental Talks

5. "Less is More: Degrees of Compositionality for Complex Signals", Interdisciplinary Workshop Series, Department of Philosophy, McGill University, 23 October 2018.

4. "Power By Association" IMBS Friday Seminar, Institute for Mathematical Behavioral Sciences, University of California, Irvine, 27 April 2018.

3. "On Salience and Signaling in Sender-Receiver Games" Social Dynamics Seminar (Fall 2017), Department of Logic and Philosophy of Science, University of California, Irvine, 2 October 2017.

2. "On Signaling Games and Their Models" Social Dynamics Seminar (Fall 2016), Department of Logic and Philosophy of Science, University of California, Irvine, 22 November 2016.

1. "A Prélude to Fractional Quantification" Simon Fraser University Philosophy Graduate Student Colloquium, Simon Fraser University, Burnaby, 7 November 2014.

Commentor

3. "A Pragmatic-Semiotic Defence of Bivalent Logic" CPA/ACP 2019 Annual Congress, University of British Columbia, Vancouver, Canada, 1–4 June 2019.

2. "Responsibility for Saying and Asserting" (Henry Schiller) CPA/ACP 2018 Annual Congress, Université du Québec à Montréal, Montréal, Canada, 4–7 June 2018.

1. "Simplicity and A Priori Probability Principles" (Noa Latham) CPA/ACP 2018 Annual Congress, Université du Québec à Montréal, Montréal, Canada, 4–7 June 2018.

Academic Experience

Teaching Assistant

University of California, Irvine

Inductive Logic, Simon Huttegger Department of Logic and Philosophy of Science (31) Department of Philosophy (31)	Spring 2018
Introduction to Linguistics, Arunima Choudhury Department of Linguistics (3)	Winter 2018
Acquisition of Language, Lisa Pearl Department of Linguistics (51) Department of Cognitive Sciences (56)	Fall 2017
Inductive Logic, Simon Huttegger Department of Logic and Philosophy of Science (31) Department of Philosophy (31)	Spring 2017
Probability and Statistics for Economics I, Kent Johnson Department of Economics (15A)	Winter 2017

Simon Fraser University

Critical Thinking (PHIL xx1), Jillian McIntosh	Spring 2016
Critical Thinking (PHIL xx1), Jillian McIntosh	Fall 2015
Critical Thinking (PHIL xx1), Jillian McIntosh	Spring 2015
Introduction to Ethics (PHIL 120W), Evan Tiffany	Fall 2014

Guest Lectures

University of California, Irvine

"Language and Cognition" *Acquisition of Language* (Linguistics/Psychology), 1 Dec. 2017.

Research Assistant

University of California, Irvine

Social Dynamics and Diversity in Epistemic Communities
Cailin O'Connor (NSF Grant 1535139) 2017 – 2019

Simon Fraser University

Constructing Questions for Critical Thinking
Jillian McIntosh Spring 2015

University of British Columbia

Aristotle's Earlier Logic
John Woods Summer 2014

Grants and Fellowships

Research Awards

Social Sciences and Humanities Research Council of Canada Joseph-Armand Bombardier Canada Graduate Scholarships, Simon Fraser University ($17,500 CAD), 2015-2016

Social Sciences and Humanities Research Council of Canada Joseph-Armand Bombardier Canada Graduate Scholarships, University of British Columbia ($17,500 CAD), DECLINED, 2014-2015

Academic Awards

University of California, Irvine

Justine Lambert Graduate Prize in the Foundations of Science, for "On Salience and Signaling: Partial Pooling, Learning, and Focal Points", University of California, Irvine ($1000 USD), 2018.

Social Science Merit Fellowship ($257,818 USD), 2016–2022

Simon Fraser University

Graduate Fellowship ($6250 CAD), 2015

Professional Service

Referee. The Vancouver Summer Philosophy Conference, 2019.

Symposium Organiser. "Evolutionary Explanations of Compositional Communication" Philosophy of Science Association 2018 Biennial Meeting, November, 2018.

Chair. The Vancouver Summer Philosophy Conference (19–23 August 2018, Vancouver, CAN); F-SEW: Formal Social Epistemology Workshop (25–26 May 2018, Irvine, USA); The Western Canadian Philosophical Association 54th Annual Meeting (13–15 October 2017, Regina, CAN); The Ninetieth Annual Meeting of the American Philosophical Association, Pacific Division (30 March – 3 April 2016, San Francisco, USA).

SPECIALIZED TRAINING

University of California, Irvine

Sex Offense Prevention Training	Fall 2017
Teaching Assistant Professional Development Program	Fall 2016

Simon Fraser University

TA/TM Day: Teaching Orientation Program	2014–2016

LANGUAGES

English (native), French (intermediate)

TECHNICAL CAPACITIES

Mathematics:
Ordinary / Partial Differential Equations, Linear Algebra, Multivariate / Vector Calculus

Logic:
Set Theory, Modal Logic, Predicate Logic

Programming Languages:
Python, Java, Javascript

Markup:
LaTeX, HTML, CSS

Computation and Graphing:
R, MatLab, Excel

AFFILIATIONS

Canadian Philosophical Association
Philosophy of Science Association
American Philosophical Association
Society for Exact Philosophy

References

Dissertation Committee

Dr. Jeffrey A. Barrett
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External References

Dr. Joshua Armstrong
Assistant Professor
350 Dodd Hall
Department of Philosophy
University of California, Los Angeles
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Dr. Nicolas Fillion
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Department of Philosophy
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Dr. Christopher Mole
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Buchanan E 369
Department of Philosophy
The University of British Columbia
Vancouver, BC, V6T-1Z1, Canada

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✉ cmole@ubc.ca

Seminars and Graduate Coursework

(† = Directed Study, ∗ = Audit)

Epistemology & Philosophy of Language	Bayesian Epistemology	S. Huttegger	UCI	2018
	Information Theory	C. O'Connor	UCI	2017
	Metasemantics	O. Simchen	UBC	2015
	Language at the Interface	A. Atkins	SFU	2015
	Recent Perspectives on the *A Priori**	P. Hanson	SFU	2015
	Errors of Reasoning	J. Woods	UBC	2014
Decision & Game Theory	Social Dynamics	B. Skyrms	UCI	2016-18
	Evolution and Learning in Games	J. Carvalho	UCI	2017
	Evolutionary Game Theory	S. Huttegger	UCI	2016
	Decision Theory and Game Theory	N. Fillion	SFU	2014
Natural & Aritifical Intelligence	Adv. Topics in Computing Systems*	D. Precup	McGill	2019
	Fundamentals of Machine Learning*	I. Mitliagkas	UdeM	2018
	Deep Learning†		UCI	2018
	Reinforcement Learning	R. Dechter	UCI	2018
	Intro to Artificial Intelligence	K. Kask	UCI	2017
	Conscious Systems	K. Saberi	UCI	2017
Logic & Philosophy of Logic	Undecidability and Incompleteness	K. Johnson	UCI	2017
	Metalogic	K. Wehmeier	UCI	2017
	Set Theory	S. Walsh	UCI	2016
	Modal Logic	S. Walsh	UCI	2016
	Hypergraphs and Philosophy	R. Jennings	SFU	2014
Mathematics & Philosophy of Mathematics	Mathematical & Computational Bio	G. A. E. Ruiz	UCI	2017
	Philosophy of Set Theory	P. Maddy	UCI	2016
	History of Analysis	T. Archibald	SFU	2016
History of Philosophy	Frege, Russell, Wittgenstein	J. Heis	UCI	2017
	Hume's Treatise	K. Schafer	UCI	2017
	Leibniz and Berkeley*	D. Heide	SFU	2016
	Descartes	L. Shapiro	SFU	2015
Ethics	Direction of Moral Duties	A. Zylberman	SFU	2016
	Responsibility & Excuse	E. Tiffany	SFU	2015
	Pro-Seminar	E. Tiffany	SFU	2014
Professional Training	Professional Development	D. Pritchard	UCI	2019
	University Teaching	M. McBride	UCI	2018
	University Teaching	M. McBride	UCI	2017

Last updated: August 13, 2019

Selected Course Evaluations [1]

7- Among Best	4- OK	1- Among Worst

LPS 31: Introduction to Inductive Logic

Spring, 2018; $n = 22$

	MEAN	St. Dev.	MEAN (All S.S. Courses)
TA was competent in course material	6.55	0.66	5.91
TA was able to make presentations clearly	6.48	0.73	5.85
TA was responsive to students	6.45	0.72	5.97
TA was able to integrate the lecture and discussion material	6.50	0.72	5.94
TA was present and on time for discussion sections and office hours	6.64	0.57	6.09
The discussion sections were useful to the success of the course	6.36	1.02	5.81
I would expect another course with this TA to be	6.64	0.57	5.84
General teaching effectiveness	**6.50**	**0.84**	**5.63**

LING 3: Introduction to Linguistics

Winter, 2018; $n = 75$

	MEAN	St. Dev.	MEAN (All S.S. Courses)
TA was competent in course material	5.84	1.14	5.83
TA was able to make presentations clearly	5.87	1.10	5.78
TA was responsive to students	5.93	1.14	5.94
TA was able to integrate the lecture and discussion material	5.95	1.15	5.89
TA was present and on time for discussion sections and office hours	6.07	1.11	6.11
The discussion sections were useful to the success of the course	5.74	1.36	5.74
I would expect another course with this TA to be	5.85	1.24	5.78
General teaching effectiveness	**5.78**	**1.11**	**5.60**

LING 51 / COGS 56: Acquisition of Language

Fall, 2017; $n = 35$

	MEAN	St. Dev.	MEAN (All S.S. Courses)
TA was competent in course material	5.60	1.57	5.72
TA was able to make presentations clearly	5.83	1.52	5.65
TA was responsive to students	5.66	1.57	5.83
TA was able to integrate the lecture and discussion material	5.45	1.63	5.77
TA was present and on time for discussion sections and office hours	5.50	1.61	5.98
I would expect another course with this TA to be	5.60	1.55	5.65
General teaching effectiveness	**5.47**	**1.45**	**5.52**

LPS 31: Introduction to Inductive Logic

Spring, 2017; $n = 26$

	MEAN	St. Dev.	MEAN (All S.S. Courses)
TA was competent in course material	6.19	1.44	5.86
TA was able to make presentations clearly	5.88	1.55	5.79
TA was responsive to students	6.16	1.46	5.93
TA was able to integrate the lecture and discussion material	6.08	1.47	5.89
TA was present and on time for discussion sections and office hours	6.26	1.45	6.06
The discussion sections were useful to the success of the course	5.87	1.75	5.74
I would expect another course with this TA to be	6.00	1.56	5.77
General teaching effectiveness	**5.93**	**1.21**	**5.63**

[1] Full course evaluations available upon request

SELECTED COURSE EVALUATIONS (CONT'D)

7- Among Best	4- OK	1- Among Worst

ECON 15A: Probability & Statistics for Economics I
Winter, 2017; $n = 49$

	MEAN	St. Dev.	MEAN (All S.S. Courses)
TA was competent in course material	5.02	1.58	5.86
TA was able to make presentations clearly	5.02	1.68	5.78
TA was responsive to students	5.31	1.75	5.96
TA was able to integrate the lecture and discussion material	5.06	1.69	5.90
TA was present and on time for discussion sections and office hours	5.73	1.55	6.15
The discussion sections were useful to the success of the course	4.90	1.92	5.72
I would expect another course with this TA to be	4.88	1.75	5.79
General teaching effectiveness	**5.18**	**1.411**	**5.67**

5- Very Much So	3- So-So	1- Not At All

PHIL xx1: Critical Thinking
Spring, 2016; $n = 34$

	MEAN	St. Dev.
The grading was fair	4.68	0.53
Assignments were returned promptly	4.88	0.32
TA directed the tutorial well	4.56	0.95
Tutorials were helpful in clarifying course material	4.56	0.91
Comments on written work were helpful	4.56	0.77
TA was well prepared	4.71	0.57
TA was easy to follow	4.47	0.81
TA answered questions helpfully	4.79	0.47
TA was aware when students did not understand the material	4.53	0.65
TA had a positive attitude toward thoughtful disagreement	4.74	0.61
Overall (Tutorials)	**4.53**	**0.74**
Overall (TA)	**4.62**	**0.69**

PHIL xx1: Critical Thinking
Fall, 2015; $n = 49$

	MEAN	St. Dev.
The grading was fair	4.37	0.87
Assignments were returned promptly	4.71	0.57
TA directed the tutorial well	4.55	0.76
Tutorials were helpful in clarifying course material	4.39	0.88
Comments on written work were helpful	4.08	1.08
TA was well prepared	4.57	0.70
TA was easy to follow	4.29	0.97
TA answered questions helpfully	4.41	0.99
TA was aware when students did not understand the material	4.16	1.08
TA had a positive attitude toward thoughtful disagreement	4.41	1.05
Overall (Tutorials)	**4.42**	**0.79**
Overall (TA)	**4.44**	**0.98**

Selected Course Evaluations

5- Very Much So	3- So-So	1- Not At All

PHIL xx1: Critical Thinking
Spring, 2015; $n = 37$

	MEAN	St. Dev.
The grading was fair	4.00	1.01
Assignments were returned promptly	4.69	0.57
TA directed the tutorial well	4.27	0.98
Tutorials were helpful in clarifying course material	4.41	0.85
Comments on written work were helpful	3.73	1.06
TA was well prepared	4.35	0.91
TA was easy to follow	4.24	1.00
TA answered questions helpfully	4.30	0.90
TA was aware when students did not understand the material	4.32	0.99
TA had a positive attitude toward thoughtful disagreement	4.41	0.94
Overall (Tutorials)	**4.35**	**0.81**
Overall (TA)	**4.53**	**0.76**

PHIL 120W: Introduction to Ethics
Fall, 2014; $n = 30$

	MEAN	St. Dev.
The grading was fair	3.17	1.13
Assignments were returned promptly	4.30	0.74
TA directed the tutorial well	3.60	0.95
Tutorials were helpful in clarifying course material	3.50	1.02
Comments on written work were helpful	3.73	0.96
TA was well prepared	4.03	0.84
TA was easy to follow	3.33	1.14
TA answered questions helpfully	3.57	1.12
TA was aware when students did not understand the material	3.20	1.01
TA had a positive attitude toward thoughtful disagreement	3.48	1.28
Overall (Tutorials)	**3.63**	**0.91**
Overall (TA)	**3.63**	**1.08**

DISSERTATION ABSTRACT

Communication is found everywhere in nature; however, language is often taken to be unique to humans. Two questions immediately arise: *What fundamentally distinguishes language from simple systems of communication? How did language evolve?* My dissertation suggests answers to these questions by providing a novel way of understanding the evolution of complex communicative dispositions. I show how simple communication systems themselves might compose to create more complex systems. This view prioritises the *reflexivity* of language as the correct explanatory target for bridging the gap between ubiquitous animal communication and distinctively human language.

This challenges the dominant view concerning the evolution of language, which attempts to resolve this explanatory gap by demonstrating how complex syntax evolved. One key difference between communication and language that researchers often point to is the *generative capacity* of languages: with a finite vocabulary and a finite set of grammatical rules, natural languages allow for the production of an unlimited number of novel expressions. This is often referred to as the *Principle of Compositionality*: the meaning of a complex expression is a function of the meanings of its parts and the ways in which they are combined. Simple communication systems that arise in nature lack this unbounded character.

I argue that this focus on syntax is misplaced. On the one hand, such accounts fail to maintain sensitivity to empirical data regarding evolutionary precursors—insofar as genuinely compositional syntax is rare or nonexistent in nature. On the other hand, a system of communication is either compositional or it is not—I argue that there is no room for so-called *protocompositionality*, so these explanations run a foul of the gradualist assumptions in which they are couched.

In contrast, my account prioritises the reflexivity of natural language—the ability to use language to talk about language—as an alternative explanatory target, since this also constitutes a fundamental difference between language and communication. Furthermore, reflexivity has salient precursors in simple communication systems, so it can account for empirical data; it offers a genuinely gradualist perspective; and it is able to give rise to hierarchical compositional structures. Thus, complex syntax is a *byproduct*, rather than a target, on my view.

I argue that what drives the emergence of complex communication systems is a process of *modular composition*, whereby independently evolved communicative dispositions combine to create more complex dispositions. This process of modular composition depends on reflexivity. Once some complexity is exhibited, at a small scale, it may lead to a 'feedback loop' between communication and cognition that gives rise to the complexity we see in natural language. This further serves to connect parallel research in the evolution of language and cognitive systems.