

Jonathan Rawski

Curriculum Vitae

Department of Linguistics,
Institute for Advanced Computational Science
Stony Brook University, Stony Brook, NY, 11794
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Education

- 2016–Present **PhD, Linguistics.**
Stony Brook University
Dissertation: Structure and Learning in Phonology
Advisor: Jeffrey Heinz
- 2014–2016 **MSc, Cognitive Science.**
Higher School of Economics - Moscow
Thesis: Homeostasis in Harmonic Grammar
Thesis Advisors: Boris Gutkin (HSE/Ecole Normale) and Paul Smolensky (Johns Hopkins)
- 2010–2013 **BA, Linguistics.**
University of Minnesota - Twin Cities

Non Degree-Conferring

- 2019 LSA Linguistic Institute
- 2017 Crete Summer School of Linguistics
- 2016 Visiting Graduate Student, Neural Theory Group, École Normale Supérieure, Paris
- 2015, 2016 New York-St. Petersburg Institute for Linguistics, Cognition, and Culture (NYI)
- 2016 Winter Mathematics School, Higher School of Economics, Moscow

Research Areas

- Linguistics Computational/Mathematical Linguistics, Learnability, Phonology
- Neuroscience Neuronal Computation, Reinforcement Learning, Supervised Learning

Research Positions & Affiliations

- 2019-present Graduate Assistant
Department of Neurobiology and Behavior, Stony Brook University
Developing Center for Neural Circuit Dynamics, aided grant writing for \$3.5m NIMDH Grant
- Summer 2018 Research Assistant for Jeffrey Heinz, under NIH grant #R01HD87133-01
Research Assistant to Thomas Graf, under Stony Brook TALENT grant
SBU Computational Linguistics Lab
Developed Interactive, Open Source Learning Platform for Mathematical Linguistics
- 2017-present Graduate Student Member
Institute for Advanced Computational Science, Stony Brook University

- 2015-2016 Graduate Assistant
Theoretical Neuroscience Group, Higher School of Economics, Moscow
- Spring 2015 Research Assistant
Neurolinguistics Laboratory, Higher School of Economics, Moscow
- 2013 Undergraduate Researcher
Department of Speech-Language-Hearing Sciences, University of Minnesota
- 2012-2013 Student Manager, Undergraduate Research Assistant
NuMI Off-Axis Electron Neutrino Appearance (NOvA) Laboratory
Department of Physics, University of Minnesota

Teaching Positions

Primary Instructor

- Stony Brook Language and Politics - Winter 2019
Human Language - Summer 2017
Writing in Linguistics - Winter 2017, 2018
Advanced English Academic Writing - Spring 2017
- TWMS ESL Teacher, Head of English - 2013-2014
Hong Kong

Teaching Assistant

- Stony Brook Language and Technology - Fall 2018
Language Acquisition - Spring 2018
Human Language - Fall 2016
- HSE Intro to Cognitive Science - Fall 2015, Spring 2016
- LSA Institute Computational Phonology - Summer 2019
- CreteLing Introduction to Phonology - Summer 2017

Grants and Awards

- 2018-2020 IACS Junior Researcher Fellowship — \$34,000 per year + \$8000 travel funding
- 2018 IACS Travel Award — \$2000 travel funding
- 2017 Crete Summer School of Linguistics Fellowship (tuition, lodging)
- 2014-2016 Higher School of Economics Graduate Fellowship (tuition, lodging, stipend)
- 2014-2016 Russian Federation Graduate Scholarship
- 2012-2013 University of Minnesota UROP Grant (Co-PI with Peter Watson). "The Influence of Positive Correction on Phonological Learning" — \$2400
- 2011-2013 North Central Electric League Scholarship
- 2010-2013 Tyer Hill Memorial Scholarship

Publications and Manuscripts

Note: author ordering is often alphabetical

Journal Articles

- in prep* Dolatian, Hossep and **Jonathan Rawski**. Computational Locality in Nonconcatenative Phonology
- in review* Lambert, Dakotah, **Jonathan Rawski**, and Jeffrey Heinz. Typology Emerges from Simplicity in Representations and Learning
- in review* **Rawski, Jonathan**. The Logical Nature of Phonology Across Speech and Sign.
- 2020 De Santo, Aniello and **Jonathan Rawski**. *What Can Formal Language Theory Do for Animal Cognition Studies?* Royal Society Open Science
- 2019 **Rawski, Jonathan** and Jeffrey Heinz. *No Free Lunch in Linguistics or Machine Learning: Reply to Pater*. *Language*, 95(1)
- 2015 **Rawski, Jonathan**. *Second-Language Phonology Learning and Neuroplasticity*. In *Linguistic Portfolios - The Year's Best Student Research: Vol. 4*. St. Cloud State University (based on BA thesis work).

Paper-reviewed Conference Proceedings

- 2020 Nelson, Max, H. Dolatian, **J. Rawski**, B. Prickett. *Probing RNN Encoder-Decoder Generalization of Subregular Functions using Reduplication*. Proceedings of the Society for Computation in Linguistics, volume 3.
- 2020 Dolatian, Hossep and **Jonathan Rawski**. *Multi-Input Strictly Local Functions for Templatic Morphology*. Proceedings of the Society for Computation in Linguistics, volume 3.
- 2020 **Rawski, Jonathan** and Hossep Dolatian. *Multi-Input Strictly Local Functions for Tonal Phonology*. Proceedings of the Society for Computation in Linguistics, volume 3.
- 2019 **Rawski, Jonathan**. *Tensor Product Representations of Subregular Formal Languages*. Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI) workshop on Neural-Symbolic Learning and Reasoning
- 2019 Chandlee, Jane, R. Eyraud, J. Heinz, A. Jardine, **J. Rawski**. *Learning with Partially Ordered Representations*. In Proceedings of the 16th Meeting of the ACL Special Interest Group on the Mathematics of Language (SIGMOL 2019)

Abstract-reviewed Conference Proceedings

- 2019 Dolatian, Hossep, **Jonathan Rawski**. *Finite-State Locality in Semitic Root-and-Pattern Morphology*. Proceedings of the 43rd Penn Linguistics Conference
- 2019 Chandlee, Jane, R. Eyraud, J. Heinz, A. Jardine, **J. Rawski**. *How the Structure of the Constraint Space Enables Learning*. Proceedings of the Society for Computation in Linguistics
- 2018 De Santo, A., **J. Rawski**, and J.E. Drury. *Quantified Sentences as a Window Into Prediction and Priming: An ERP Study*. Proceedings of the 54th Meeting of the Chicago Linguistics Society

2018 **Rawski, Jonathan**. *Subregular Complexity Across Speech and Sign*. Proceedings of the Society for Computation in Linguistics

2017 **Rawski, Jonathan**. *Phonological Complexity Across Speech and Sign*. Proceedings of the 53rd Meeting of the Chicago Linguistics Society

Book Chapters

in prep Alena Aksenova, **Jonathan Rawski** Jeffrey Heinz, Thomas Graf. *The Computational Power of Harmony Patterns*. in Harry van der Hulst (ed.), *The Oxford Handbook of Harmony*.

in prep **Rawski, Jonathan**. *First-Order Definable Sign Language Mappings*. in J. Heinz (ed.), *Doing Computational Phonology*.

to appear Bakovic, Eric, Jeffrey Heinz, and **Jonathan Rawski**. *Phonological abstraction in the mental lexicon*. in Lila R. Gleitman, Anna Papafragou (ed.), *The Oxford Handbook of the Mental Lexicon*.

to appear Heinz, Jeffrey and **Jonathan Rawski**. *Learnability*. in B. Elan Dresher and Harry van der Hulst (eds.), *The Oxford Handbook of the History of Phonology*.

Presentations

Invited Talks

2020, Feb *Understanding Machine Learning with Language and Tensors. What Do Formal Languages Tell Us About Cognition? Phonology and the Chomsky Hierarchy.*
Concordia University, Montreal

2019, Nov *Understanding Machine Learning with Language and Tensors.*
Dept. of Physics and Astronomy, Stony Brook University

2019, May *Subregular Morphology: Structures, Grammar, and Learning.*
Computational Psycholinguistics Group, Waseda University, Tokyo, Japan

2019, May *The Logical Nature of Phonology Across Speech and Sign.*
Linguistics Department, New York University

2019, Mar *How the Structure of the Constraint Space Enables Learning.*
L'UFR Linguistique, Université Paris 7 Diderot

2018, Nov *Learning with Partially Ordered Representations.*
IACS Seminar Series, Stony Brook University

2018, Oct *The Computational Nature of Phonology Across Speech and Sign. How the Structure of the Constraint Space Enables Learning.*
Linguistics Department, University of Connecticut

2018, Mar *The Logical Complexity of Phonology Across Speech and Sign.*
Institut Jean Nicod, Ecole Normale Supérieure

2016, Nov *Homeostatic Reinforcement Learning for Harmonic Grammars.*
Linguistics Department, Massachusetts Institute of Technology

2016, April *Homeostasis in Harmonic Grammar*
Laboratoire de Neurosciences Cognitives, Ecole Normale Supérieure

2015, Nov *Linguistic Structure from Neural Computation*
Center for Cognition, Higher School of Economics

2013, April *Neuroplasticity and Second-Language Learning*
Linguistics Colloquium, University of Minnesota

Conference and Workshop Talks

2020, Jan Nelson, Max, H. Dolatian, **J. Rawski**, B. Prickett. *Probing RNN Encoder-Decoder Generalization of Subregular Functions Using Reduplication*. Society for Computation in Linguistics

2020, Jan Dolatian, Hossep and **Jonathan Rawski**. *Multi-Input Strictly Local Functions for Templatic Morphology*. Society for Computation in Linguistics

2019, Nov **Rawski, Jonathan**. *Tensor Product Representations of Subregular Constraints*. Northeast Computational Phonology Circle, Rutgers University.

2019, Aug **Rawski, Jonathan**. *Tensor Product Representations of Subregular Formal Languages*. 14th Neural-Symbolic Learning and Reasoning Workshop at the International Joint Conference on Artificial Intelligence (IJCAI), Macau.

2019, July **Rawski, Jonathan**, Aniello de Santo, Thomas Graf, Jeffrey Heinz. *Geometric Representations of Linguistic Structures and Computations*. Annual Meeting of the Society for Mathematical Psychology, Montréal, Canada.

2019, July Jane Chandlee, Remí Eyraud, Jeffrey Heinz, Adam Jardine, **Jonathan Rawski**. *Learning with Partially Ordered Representations*. 16th Meeting on the Mathematics of language (SIGMOL 2019). Toronto.

2019, June Jane Chandlee, Remí Eyraud, Jeffrey Heinz, Adam Jardine, **Jonathan Rawski**. *Learning with Partially Ordered Representations*. University of Reykjavik, Iceland. Workshop on Learning and Automata (LearnAut) at the ACM/IEEE Symposium on Logic in Computer Science (LICS 2019).

2019, May **Rawski, Jonathan**. *Grammars, Structures, and Learning with Sparse Data*. Stony Brook-Tokyo Institute of Technology Joint Meeting. Tokyo.

2019, May Jane Chandlee and **Jonathan Rawski**. *Learning with Locality Across Speech and Sign*. Workshop on Rules and Learning Strategies Across Spoken and Signed Language at the 43rd Generative Linguistics in the Old World Conference. Oslo.

2019, May Dolatian, Hossep and **Jonathan Rawski**. *The Computational Nature of Templatic Morphology*. 4th American International Morphology Meeting. New York.

2019, Apr Dolatian, Hossep and **Jonathan Rawski**. *The Computational Nature of Templatic Morphology*. Phonology in the NorthEast. Yale University

2019, Apr Dolatian, Hossep, **Jonathan Rawski**, Sedigheh Moradi. *Computational Implementation of Semitic Template Matching*. Annual Symposium on Arabic Linguistics. Toronto.

2019, Mar Dolatian, Hossep, **Jonathan Rawski**, Sedigheh Moradi. *The Computational Nature of Templatic Morphology*. 43rd Penn Linguistics Conference. UPenn, Philadelphia.

2018, Nov **Rawski, Jonathan**, Jane Chandlee, Remí Eyraud, Jeffrey Heinz, Adam Jardine. *How the Constraint Space Structure Enables Learning*. NorthEast Computational Phonology Circle. MIT, Boston.

- 2018, July Graf, Thomas, A. Aksenova, A. de Santo, H. Dolatian, **J. Rawski**, S. Yang, J. Heinz. *Tiers and Relativized Locality Across Language Modules*. Parallels Between Phonology and Syntax Workshop. Meertens Institut, Amsterdam.
- 2018, May **Rawski, Jonathan**, Jeffrey Heinz, Adam Jardine, Jane Chandlee. *How the Constraint Space Structure Facilitates Learning*. 10th North American Phonology Conference. Concordia University, Montreal.
- 2018, Apr De Santo, A., **J. Rawski**, and J.E. Drury. *Quantified Sentences as a Window into Prediction and Priming: An ERP Study*. Talk. The 54th Annual Meeting of the Chicago Linguistic Society. University of Chicago.
- 2018, Mar **Rawski, Jonathan**. *Pirates and Emperors: On Publishers, Journalists, and Academic Elites*. Talk. Conference on The Social Responsibility of Intellectuals, New School for Social Research
- 2017, May **Rawski, Jonathan**. *Phonological Complexity is Subregular: Evidence from Sign Language*. Talk. The 53rd Annual Meeting of the Chicago Linguistic Society. University of Chicago.
- 2016, Dec **Rawski, Jonathan**. *Homeostatic Reinforcement Learning for Harmonic Grammars*. Talk. SYNC Conference, CUNY
- 2013, April **Rawski, Jonathan**. *Neuroplasticity in Second Language Learning*. Talk. Minnesota Undergraduate Linguistics Symposium, St. Olaf University

Conference Posters

- 2020, Jan **Rawski, Jonathan** and Hossep Dolatian. *Multi-Input Strictly Local Functions for Tonal Phonology*. Proceedings of the Society for Computation in Linguistics, volume 3.
- 2019, Oct Dolatian, Hossep and **Jonathan Rawski**. *Computing Tone: Input Strict Locality over Multiple Inputs*. Annual Meeting on Phonology, Stony Brook University.
- 2019, Jan **Rawski, Jonathan**, Jeffrey Heinz, Adam Jardine, Jane Chandlee. *How the Structure of the Constraint Space Enables Learning*. Poster. Society for Computation in Linguistics Meeting, New York City
- 2018, May **Rawski, Jonathan**, Jeffrey Heinz, Adam Jardine, Jane Chandlee. *Learning Within Linguistically Structured Constraint Spaces*. Joint Science Meeting, Stony Brook University.
- 2018, Jan **Rawski, Jonathan**. *Subregular Complexity Across Speech and Sign*. Poster. Society for Computation in Linguistics Meeting, Salt Lake City
- 2017, Nov De Santo, A., **J. Rawski**, and J.E. Drury. *ERP effects for quantifier complexity, priming, and truth-value in an auditory/visual verification task*. Society for the Neurobiology of Language Annual Meeting, Baltimore.
- 2017, Sept **Rawski, Jonathan**, A. de Santo, and J. Heinz. *Reconciling Minimum Description Length with Grammar-Independent Complexity Measures*. Poster. MIT Workshop on Simplicity in Grammar Learning
- 2015, June **Rawski, Jonathan**. *A Homeostatic Space for Optimality Theoretic Grammars*. Poster. Pronouns: Syntax, Semantics, Processing Conference, Moscow

2013, Aug **Rawski, Jonathan**. *The Influence of Feedback On L2 Phonology Learning*. Poster. UROP Summer Symposium, University of Minnesota

Professional Service and Affiliations

Journal Reviews

- 2020 Cognitive Science
- 2020 Journal of Language Modeling
- 2019 Phil. Trans. Royal Society B: Biological Sciences
- 2018 Language

Departmental/University Service

- 2018-Present Student President, Institute for Advanced Computational Science
- 2018 Organizer, Stony Brook-Yale-NYU-CUNY (SYNC) Conference
- 2017-2018 Organizer, Mathematical Linguistics Reading Group
- 2017 Organizer, Northeast Computational Phonology Workshop
- 2017 Organizer, Linguistics Colloquium Series

Professional Memberships

- 2017-Present Linguistic Society of America
- 2017-Present Society for the Neurobiology of Language

Languages

Natural

- Native **English**
- Advanced **Spanish**
- Intermediate **Russian**
- Beginner **French**

Formal

LaTeX, Python, MatLab, Haskell, HTML/CSS

Other Skills

- Computational dynamical systems, tree parsing (dependency, minimalist grammars, TAG), finite-state string/tree automata, constraint-based learning/grammar, ANNs
- Modeling
- Experimental EEG, MEG, fMRI, TMS, tDCS
- Methods