

# Jonathan Rawski

Department of Linguistics & Language Development  
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## Curriculum Vitae

### Employment & Affiliations

- 2023-2024 **Massachusetts Institute of Technology**  
Visiting Professor, Department of Linguistics & Philosophy (invited position)
- 2021-present **San Jose State University**  
Assistant Professor, Department of Linguistics & Language Development  
*tenure-track, on leave for 2023-2024*
- 2016-2021 **Stony Brook University**  
Graduate Assistant, Computational Linguistics Lab  
Graduate Assistant, Department of Neurobiology and Behavior  
Research Fellow, Institute for Advanced Computational Science  
*Research Activities; Developing Center for Neural Circuit Dynamics; writing \$4.5m NIH BRAIN Initiative Grant "Metastable dynamics in cortical circuits"*
- 2015-2016 **Higher School of Economics**  
Graduate Assistant, Theoretical Neuroscience Group & Neurolinguistics Laboratory
- 2012-2013 **University of Minnesota**  
Undergraduate Researcher, Department of Speech-Language-Hearing Sciences  
Student Manager & Research Assistant, NuMI Off-Axis Electron Neutrino Appearance (NOvA) Laboratory, Department of Physics

### Research Areas

- Linguistics Phonology, Morphology, Learnability, Computational/Mathematical Linguistics
- Computer Science Algorithmic Learning Theory, Automata Theory, Formal Languages, Finite Model Theory, Machine learning

### Education

- 2016–2021 **PhD, Linguistics.**  
Stony Brook University  
Dissertation: Structure and Learning in Natural Language  
Advisor: Jeffrey Heinz
- 2014– 2016 **MSc, Cognitive Science.**  
Higher School of Economics  
Thesis: Homeostasis in Harmonic Grammar  
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

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## Courses Taught

### Primary Instructor

- MIT Special Topics in Linguistics: Learnability and Linguistic Theory - S24  
Topics in Computational Linguistics: Grammars & Representations - F23
- San Jose State Introduction to Linguistics - F21, S22, F22  
Speech Technology - F21, F22  
Sound & Communication - S23  
Corpus Linguistics - S22  
Natural Language Processing - S22, S23
- Stony Brook IACS Summer Youth Camp for Computational Linguistics - Sum20  
Human Language - Sum17  
Writing in Linguistics - W17, W18  
Advanced English Academic Writing - S17

### Teaching Assistant

- Stony Brook Computational Linguistics - S21  
Language and Technology - F18, F20  
Language Acquisition - S18  
Human Language - F16
- LSA Institute Computational Phonology - Sum19
- CreteLing Summer School Introduction to Phonology - Sum17
- HSE Intro to Cognitive Science - F15, S16

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## Grants and Awards

- 2021 President's Award to Distinguished Doctoral Students, Stony Brook University
- 2018 – 2020 IACS Junior Researcher Fellowship
- 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"
- 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* Heinz, Jeffrey and **Rawski, Jonathan**. *Abductive Inference of Phonotactic Constraints*
- in prep* Coty Gonzalez, Jana Jarecki, Frank JÄdkel, **Jonathan Rawski**, Joshua Skewes, Sashank Varma, Cory Wright. *Unification in a Post-Architectural World*
- in prep* **Rawski, Jonathan**. *Computational Locality in Signed Phonology*
- in revision* Levenstein, Daniel, Aniello De Santo, Saskia Heijnen, Manjari Narayan, Freek J.W. Oude Maatman, **Jonathan Rawski**, Cory Wright. *The problem-ladenness of theory*.
- in revision* Dolatian, Hossep and **Jonathan Rawski**. *Computational Locality in Nonlinear Morpho-phonology*
- 2023 **Rawski, Jonathan**, Hossep Dolatian, Jeffrey Heinz and Eric Raimy. *Regular and Polyregular Theories of Reduplication*. *Glossa*
- 2021 Lambert, Dakotah, **Jonathan Rawski**, and Jeffrey Heinz. *Typology Emerges from Simplicity in Representations and Learning*. *Journal of Language Modeling*.
- 2021 **Rawski, Jonathan**, William Idsardi, and Jeffrey Heinz. *Comment on "Nonadjacent Dependency Processing in Monkeys, Apes, and Humans"*. *Science Advances*
- 2021 Aronoff, Mark, **Jonathan Rawski**, and Wendy Sandler. *Talk Isn't So Cheap*. *Inference*.
- 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)

### Paper-reviewed Conference Proceedings

- 2022 Valvoda, Josef, **Jonathan Rawski**, Naomi Saphra, Ryan Cotterell, Adina Williams. *Benchmarking Compositionality with Formal Languages*. *Proceedings of COLING 2022*
- 2021 Dolatian, Hossep, Jeffrey Heinz, and **Jonathan Rawski**. *Strong Generative Capacity of Morphological Processes*. *Proceedings of the Society for Computation in Linguistics*, volume 4. Association for Computational Linguistics.
- 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. Association for Computational Linguistics
- 2020 Dolatian, Hossep and **Jonathan Rawski**. *Multi-Input Strictly Local Functions for Templatic Morphology*. *Proceedings of the Society for Computation in Linguistics*, volume 3. Association for Computational Linguistics

- 2020 **Rawski, Jonathan** and Hossep Dolatian. *Multi-Input Strictly Local Functions for Tonal Phonology*. Proceedings of the Society for Computation in Linguistics, volume 3. Association for Computational Linguistics
- 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 on the Mathematics of Language (SIGMOL 2019), Association for Computational Linguistics (ACL).

### Abstract-reviewed Conference Proceedings

- 2021 Koser, Nate, Hossep Dolatian, **Jonathan Rawski**, and Kristina Strother-Garcia. *Computational Restrictions on Iterative Prosodic Processes*. Proceedings of the Annual Meeting on Phonology.
- 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. Association for Computational 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

### Peer-Reviewed Book Chapters

- in prep* Heinz, Jeffrey, Jason Riggle, and **Jonathan Rawski**. *Learnability*. in Nasukawa, Samuels, Schwartz, Torkencyz (ed.), Wiley-Blackwell Companion to Phonology.
- in prep* **Rawski, Jonathan** and Connor Mayer. *Computational Approaches to Phonology*. in Nasukawa, Samuels, Schwartz, Torkencyz (ed.), Wiley-Blackwell Companion to Phonology.
- to appear* **Rawski, Jonathan**. *Compound Reduction in Signed Phonology*. in J. Heinz (ed.), Doing Computational Phonology.
- to appear* Alena Aksenova, **Jonathan Rawski** Jeffrey Heinz, Thomas Graf. *The Computational Power of Harmony*. in Harry van der Hulst (ed.), The Oxford Handbook of Vowel Harmony.
- 2022 Heinz, Jeffrey and **Jonathan Rawski**. *Learnability*. in B. Elan Dresher and Harry van der Hulst (eds.), The Oxford Handbook of the History of Phonology.
- 2022 De Santo, Aniello and **Jonathan Rawski**. *Mathematical Linguistics and Cognitive Complexity*. in Danesi, Marco (ed.), The Springer Handbook of Cognitive Mathematics.

- 2022 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*.

## Presentations

### Invited Lectures

- 2024, Mar Transductive Linguistics Redux  
Linguistics Colloquium, Rutgers University
- 2024, Feb Transductive Linguistics Redux  
Computational Linguistics Talk Series, CUNY
- 2024, Jan Transductive Linguistics Redux  
Automata seminar, Diderot
- 2023, Nov Computational Properties of Language  
Linguistics Department, Harvard University
- 2023, Sep Rethinking Poverty of the Stimulus  
Cognitive Science Colloquium, University at Buffalo
- 2023, Sep Rethinking Poverty of the Stimulus  
Language and Cognition Colloquium, Harvard University
- 2023, May Learning Subregular Transformations.  
Dagstuhl Institute Symposium on *Regular Transformations*
- 2023, May Rethinking Poverty of Stimulus  
Linguistics Colloquium, UC Irvine
- 2023, May Rethinking Poverty of Stimulus  
UCLA Psycholinguistics Seminar
- 2023, Apr Abductive Inference of Phonotactic Constraints  
Stanford P-Interest Seminar
- 2023, Jan Regular & Polyregular Functions and Transformers.  
Formal Languages and Neural Networks (FLaNN) Seminar
- 2022, Oct *Generative Capacity & the Linguistic Swampland*  
Linguistics Colloquium, UC Davis
- 2022, Jun *Generative Capacity & the Linguistic Swampland*  
LINGUAE Seminar, Ecole Normale Superieure
- 2022, Jun *Robustness in Sequential Pattern Learning Experiments*  
Department d'Etudes Cognitives, Ecole Normale Superieure
- 2022, Apr *Three Mathematical Lessons about Language Learning*  
Guest Lecture, University of Utah
- 2022, Mar *Language Emerges from Computability*  
Computer Science Dept, San Jose State
- 2021, Sep *Finite-State models and distributed computation in phonology*  
Guest Lecture, UC Berkeley

- 2021, Sep *Abductive Learning of Phonotactic Constraints*  
UC Berkeley Linguistics Phorum
- 2021, Sep *Typology Emerges from Computability*  
NLP Research Group, Monash University
- 2021, Jun *Typology Emerges from Computability*  
Association for Computational Linguistics Special Interest Group on Typology (SIGTYP) Lecture Series
- 2020, Feb *Understanding Machine Learning with Language and Tensors*  
*What Do Formal Languages Tell Us About Cognition?*  
*Phonology and the Chomsky Hierarchy (2 Lectures)*  
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
- 2013, April *Neuroplasticity and Second-Language Learning*  
Linguistics Colloquium, University of Minnesota

### Conference and Workshop Talks

- 2022, Oct **Rawski, Jonathan** and Jeffrey Heinz. *BUFIA: Phonotactic Learning with Non-statistical Abductive Inference.* Tutorial given at Annual Meeting on Phonology
- 2022, Sep **Rawski, Jonathan** and Lucie Baumont. *Phonology and the Linguistic Swampland.* Stony Brook Workshop on Model Theoretic Representations in Phonology
- 2021, Jan Dolatian, Hossep, Jeffrey Heinz, and **Jonathan Rawski.** *Strong Generative Capacity of Morphological Processes.* Society for Computation in Linguistics
- 2020, Sep **Rawski, Jonathan** and Jeffrey Heinz. *What Does "Simplicity" Mean in Grammar Learning?.* Northeast Computational Phonology Circle.

- 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 & Publishers*. 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, Sep Koser, Nate, Hossep Dolatian, **Jonathan Rawski**, and Kristina Strother-Garcia. *Computational Restrictions on Iterative Prosodic Processes*. Annual Meeting on Phonology, UC Santa Cruz.
- 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



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## Leadership, Service, and Affiliations

### Journal Reviews

- 2022 Phonology, Computational Linguistics, TACL
- 2021 Biology
- 2020 Journal of Linguistics, Journal of Language Modeling
- 2019 Phil. Trans. Royal Society B: Biological Sciences
- 2018 Language

### Conference Service

- 2023 Program Committee, Association for Computational Linguistics (ACL)
- 2023 Program Committee, International Conference on Grammatical Inference (ICGI)
- 2022 Area Chair, International Conference on Computational Linguistics (COLING)
- 2022,2023 Program Committee, ACL Special Interest Group on Computational Morphology and Phonology (SIGMORPHON)
- 2020-2022 Program Committee, Conference on Natural Language Learning (CoNLL)
- 2020 Reviewer, Cognitive Science Society Annual Meeting

### Department/University

#### SJSU

- 2023-present College Curriculum Committee
- 2022-present LLD Student Association faculty advisor
- 2021-present LLD Department Curriculum Committee
- 2021-present LLD Department Student Advisor
- 2021-present Director, Planning Committee for new MSc program "Computational Linguistics"
- 2021-2023 Planning Committee for new BSc program "Computer Science & Linguistics"
- 2021-2022 Department Hiring Committee

#### Stony Brook

- 2018-2020 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

### Students Supervised

- Andre Domingo SJSU undergrad project "Learning Polyregular Functions with Transformers"
- Alexey Genzel High School project "Language Ideology and Criticism in the Constructed Language Community" (accepted as poster at LSA 2023)

## Community Service

2017-2021 Volunteer, Community Solidarity Association Long Island  
Organized food redistribution from local groceries to local homeless shelters and people in need

## Professional Memberships

2019-Present Society for Mathematical Psychology  
2017-Present Linguistic Society of America  
2017-2021 Society for the Neurobiology of Language

## Languages

### Natural

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

### Formal

**LaTeX, R, Python, MatLab, Haskell, HTML/CSS**

## Other Skills

Computational dynamical systems, tree parsing (dependency, minimalist grammars, TAG), finite-  
Modeling state string/tree automata, Bayesian probabilistic inference, neural network model-  
ing,  
Experimental EEG, MEG, fMRI, TMS, tDCS  
Methods