

# Jonathan Rawski

## Curriculum Vitae

Department of Linguistics & Language Development  
San Jose State University San Jose, CA  
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🌐 [jrawski.info](http://jrawski.info)

## Employment & Affiliations

- 2023-2024 Visiting Faculty  
Dept. of Linguistics & Philosophy  
Massachusetts Institute of Technology
- 2021-present Assistant Professor  
Dept. of Linguistics & Language Development  
San Jose State University
- 2017-2021 Graduate Assistant  
Stony Brook Computational Linguistics Lab  
Institute for Advanced Computational Science  
*Research Activities, Developed Interactive, Open Source Learning Platform for Mathematical Linguistics*
- 2019-2021 Graduate Assistant  
Department of Neurobiology and Behavior, Stony Brook University  
*Developing Center for Neural Circuit Dynamics, grant writing for \$4.5m NIH BRAIN Initiative Grant "Metastable dynamics in cortical circuits"*
- 2015-2016 Graduate Assistant  
Theoretical Neuroscience Group, Higher School of Economics, Moscow  
Neurolinguistics Laboratory, Higher School of Economics, Moscow
- 2012-2013 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

## Research Areas

- Linguistics Phonology, Morphology, Learnability, Computational/Mathematical Linguistics
- Computer Algorithmic Learning Theory, Automata Theory, Formal Languages, Tensor Analysis,  
Science 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 - Moscow

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

San Jose Introduction to Linguistics - F21, S22, F22

State 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 Introduction to Phonology - Sum17

Summer

School

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 Tyler 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* Devezzer, Berna, Sarahanne M. Field, Nessa Ikani, Freek Oude Maatman, Erkan O. Buzbas, Riccardo Fusaroli, Nathaniel Haines, Jessica Hullman, Artem Kaznatcheev, Martin Modràk, Manjari Narayan, **Jonathan Rawski**, and Cory Wright. *What is it like to be a theorist?*
- in prep* Coty Gonzalez, Jana Jarecki, Frank JÄd'kel, **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* 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. *Learning Transductions to Test Systematic Compositionality*. *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 Riggie, 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

- 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 Supérieure
- 2022, Jun *Robustness in Sequential Pattern Learning Experiments*  
Department d'Etudes Cognitives, Ecole Normale Supérieure
- 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 Forum
- 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

## 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

2021-present Curriculum Committee  
2021-2022 Department Hiring Committee  
2021-present Lead/Director, Planning Committee for new MSc program "Computational Linguistics"  
2021-present Planning Committee for new BSc program "Computer Science & Linguistics"

### 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  
2017-2018 Linguistic Society of America  
2017-2021 Society for the Neurobiology of Language

## Languages

### Natural

Native **English**

Advanced **Spanish**

Intermediate **Russian**

Beginner **French**

### Formal

**L<sup>A</sup>T<sub>E</sub>X, 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