

Jonathan Rawski

Curriculum Vitae

Department of Linguistics & Language Development
San Jose State University San Jose, CA
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📄 jrawski.info

Employment & Affiliations

- 2021-present Assistant Professor
Dept. of Linguistics & Language Development
San Jose State University
- 2018-2021 Graduate Assistant
Stony Brook Computational Linguistics Lab
Jeffrey Heinz, Thomas Graf, SBU TALENT Grant & NIH grant #R01HD87133-01
Research Activities, Developed Interactive, Open Source Learning Platform for Mathematical Linguistics
- 2017-2021 Graduate Student Member
Institute for Advanced Computational Science, Stony Brook University
- 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
- 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 Computational/Mathematical Linguistics, Learnability, Phonology, Morphology
- 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-Confering**
- 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

Courses Taught

Primary Instructor

- San Jose State
 Introduction to Linguistics
 Speech Technology
 Corpus Linguistics
 Natural Language Processing
- Stony Brook
 IACS Summer Youth Camp for Computational Linguistics - Summer 2020
 Human Language - Summer 2017
 Writing in Linguistics - Winter 2017, 2018
 Advanced English Academic Writing - Spring 2017

Teaching Assistant

- Stony Brook
 Computational Linguistics - Spring 2021
 Language and Technology - Fall 2018, 2020
 Language Acquisition - Spring 2018
 Human Language - Fall 2016
- LSA Institute
 Computational Phonology - Summer 2019
- CreteLing Summer School
 Introduction to Phonology - Summer 2017
- HSE
 Intro to Cognitive Science - 2015 – 2016

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* **Rawski, Jonathan**. *Computational Locality in Signed Phonology*
- in review* Dolatian, Hossep, **Jonathan Rawski**, Jeffrey Heinz and Eric Raimy. *Regular and Polyregular theories of reduplication*
- in revision* Dolatian, Hossep and **Jonathan Rawski**. *Computational Locality in Nonlinear Morpho-phonology*
- 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

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

2019, Sep Dolatian, Hossep, **Jonathan Rawski.** *Finite-State Locality in Semitic Root-and-Pattern Morphology.* Proceedings of the 43rd Penn Linguistics Conference

2019, Jan 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, May 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, Jan **Rawski, Jonathan.** *Subregular Complexity Across Speech and Sign.* Proceedings of the Society for Computation in Linguistics

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

Peer-Reviewed Invited Book Chapters

in prep **Rawski, Jonathan.** *First-Order Definable Sign Language Mappings.* 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

2022, Oct *The Linguistic Swampland*
Linguistics Colloquium, UC Davis

- 2022, Jun *The Linguistic Swamp*
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

- 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

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

Conference Service

- 2022 Area Chair, International Conference on Computational Linguistics (COLING)
- 2022 Program Committee, ACL Special Interest Group on Computational Morphology and Phonology (SIGMORPHON)
- 2020,2021 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 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

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^AT_EX, 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