R. Thomas McCoy

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EDUCATION

2017–present	Johns Hopkins University: Ph.D. in Cognitive Science *Advisors:* Tal Linzen, Paul Smolensky
2013–2017	Yale University: B.A. in Linguistics, *summa cum laude*, distinction in the major *Advisor:* Robert Frank
Summer 2016	Institute on Collaborative Language Research (CoLang), University of Alaska Fairbanks
Summer 2015	Linguistic Summer Institute, University of Chicago

EMPLOYMENT

Summer/Fall 2020	Microsoft Research internship Supervisor: Asli Celikyilmaz *Analyzing text generation systems.*
Summer 2018	JSALT sentence representations team Supervisors: Sam Bowman, Ellie Pavlick *Developed techniques for analyzing learned sentence representations.*
Summer 2017	Carnegie Mellon University Low Resource Languages for Emergent Incidents (LORELEI) team Supervisor: Patrick Littell *Programmed a finite-state morphological analyzer for Oromo.*
Summer 2017	Chirila project Supervisor: Claire Bowern *Developed automatic semantic processing techniques for an online database of Australian languages.*
Summer 2016	Grammar Boot Camp Supervisor: Claire Bowern *Wrote a sketch grammar of Kuwarra.*

Summer 2015	Yale Grammatical Diversity Project Supervisors: Laurence Horn, Jim Wood, Raffaella Zanuttini, Jason Zentz *Edited web pages about regional grammatical phenomena.*
Summer 2014	Irish lip rounding research Supervisor: Ryan Bennett *Collected lip rounding measurements from images of Irish speakers.*
Summer 2014	Linguistic Core Multi-University Research Initiative Supervisors: Chris Dyer, Lori Levin *Developed an English-to-Malagasy tree-to-string transducer.*
Summer 2013	Linguistic Core Multi-University Research Initiative Supervisors: Chris Dyer, Lori Levin *Developed a finite state morphological analyzer for Kinyarwanda.*

Teaching

Spring 2020	Johns Hopkins University Role: Teaching Assistant Course: Foundations of Cognitive Science Lecture Instructor: Paul Smolensky *Led one seminar discussion and graded assignments.*
Fall 2019	Johns Hopkins University Role: Teaching Assistant Course: Computational Psycholinguistics Lecture Instructor: Tal Linzen *Led lab sessions and graded assignments.*
Spring 2019	Johns Hopkins University Role: Teaching Assistant Course: Syntax I Lecture Instructor: Géraldine Legendre *Led review sessions and graded assignments.*
Fall 2018	Johns Hopkins University Role: Teaching Assistant Course: Introduction to Computational Cognitive Science Lecture Instructor: Tal Linzen *Created educational simulations, tutorials, and homeworks in Javascript and Jupyter and taught lectures using these resources.*
Spring 2018	Johns Hopkins University Role: Fieldwork Instructor Course: World of Language Lecture Instructor: Géraldine Legendre *Led two sections of weekly fieldwork sessions complementing lectures.*

Summer 2015   Linguistic Society of America Summer Institute
               Role: Workshop Co-Instructor
               Course: Linguistic Enigmatography
               Co-Instructor: Lori Levin
               Developed and co-taught a one-week workshop on creating linguistic puzzles.

Awards

2021   Sweitzer Fellow
               Fellowship awarded by the Johns Hopkins Department of Cognitive Science to one graduate student.

2020   Finalist: Facebook Fellowship
               One of four finalists in the Natural Language Processing category; two of the four finalists received fellowships.

2019   NeurIPS Travel Grant
               Grant to fund travel to present work at the NeurIPS workshop on Context and Compositionality in Biological and Artificial Neural Systems.

2019   ICLR Travel Grant
               Grant to fund travel to present two posters at the 2019 ICLR conference.

2018–2019   Johns Hopkins University Center for Educational Resources Technology Fellowship Grant
               Co-Grantee: Tal Linzen
               Grant to develop interactive visualizations of concepts in computational cognitive science.

2018–2021   NSF Graduate Research Fellowship
               Project title: Assessing the capacity of computational models to make linguistic generalizations

2017–2020   Owen Scholars Fellowship
               Fellowship for outstanding incoming Johns Hopkins PhD students in the natural sciences.

2017   Alpheus Henry Snow Prize
               Award for the graduating Yale senior who is "adjudged by the faculty to have done the most for Yale by inspiring in his or her classmates an admiration and love for the best traditions of high scholarship."

2017   Finalist, Rhodes Scholarship

2017   Finalist, Marshall Scholarship

2016   Hart Lyman Prize
               Award for the Yale junior who "has made through his/her own efforts the best record intellectually and socially."

| 2016 | Phi Beta Kappa |
| | *One of 13 Yale students admitted as juniors.* |

| 2013 | International Linguistics Olympiad |
| | *First-place team in the world. Individual bronze medal.* |

| 2013 | United States Presidential Scholar |
| | *One of two for Pennsylvania.* |

PEER-REVIEWED PROCEEDINGS PAPERS

2021   R. Thomas McCoy, Jennifer Culbertson, Paul Smolensky, and Géraldine Legendre. Infinite use of finite means? Evaluating the generalization of center embedding learned from an artificial grammar. In *Proceedings of the 43rd Annual Conference of the Cognitive Science Society.* https://psyarxiv.com/r8ct2

2020   Michael Lepori and R. Thomas McCoy. Picking BERT's Brain: Probing for Linguistic Dependencies in Contextualized Embeddings Using Representational Similarity Analysis. In *Proceedings of the 28th International Conference on Computational Linguistics (COLING).* https://aclanthology.org/2020.coling-main.325/

2020   Paul Soulos, R. Thomas McCoy, Tal Linzen, and Paul Smolensky. Discovering the compositional structure of vector representations with Role Learning Networks. In *Proceedings of the Third BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP.* https://aclanthology.org/2020.blackboxnlp-1.23.pdf.

2020   R. Thomas McCoy, Junghyun Min, and Tal Linzen. BERTs of a feather do not generalize together: Large variability in generalization across models with similar test set performance. In *Proceedings of the Third BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP.* https://aclanthology.org/2020.blackboxnlp-1.21.pdf.

2020   R. Thomas McCoy, Erin Grant, Paul Smolensky, Thomas L. Griffiths, and Tal Linzen. Universal linguistic inductive biases via meta-learning. In *Proceedings of the 42nd Annual Conference of the Cognitive Science Society.* https://arxiv.org/pdf/2006.16324.pdf

2020   Michael Lepori, Tal Linzen, and R. Thomas McCoy. Representations of Syntax [MASK] Useful: Effects of Constituency and Dependency Structure in Recursive LSTMs. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics.* https://arxiv.org/pdf/2005.00019

2020   Junghyun Min, R. Thomas McCoy, Dipanjan Das, Emily Pitler, and Tal Linzen. Syntactic data augmentation increases robustness to inference heuristics. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics.* https://arxiv.org/pdf/2004.11999

2019   R. Thomas McCoy, Ellie Pavlick, and Tal Linzen. Right for the Wrong Reasons: Diagnosing Syntactic Heuristics in Natural Language Inference. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics.* https://www.aclweb.org/anthology/P19-1334/

2019   Samuel R. Bowman, Ellie Pavlick, Edouard Grave, Benjamin Van Durme, Alex Wang, Jan Hula, Patrick Xia, Raghavendra Pappagari, R. Thomas McCoy, Roma Patel, Najoung Kim, Ian Tenney, Yinghui Huang, Katherin Yu, Shuning Jin, and Berlin Chen. Can You Tell Me How to Get Past Sesame Street? Sentence-Level Pretraining Beyond Language Modeling. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics.* https://www.aclweb.org/anthology/P19-1439/

2019   Najoung Kim, Roma Patel, Adam Poliak, Alex Wang, Patrick Xia, R. Thomas McCoy, Ian Tenney, Alexis Ross, Tal Linzen, Benjamin Van Durme, Samuel R. Bowman, Ellie Pavlick. Probing What Different NLP Tasks Teach Machines about Function Word Comprehension. In *Proceedings of the Eighth Joint Conference on Lexical and Computational Semantics (*SEM 2019).* https://www.aclweb.org/anthology/S19-1026/.
        Best paper award at *SEM 2019.

2019   R. Thomas McCoy, Tal Linzen, Ewan Dunbar, and Paul Smolensky. RNNs implicitly implement tensor-product representations. In *International Conference on Learning Representations 2019.* https://openreview.net/forum?id=BJx0sjC5FX

2019   Ian Tenney, Patrick Xia, Berlin Chen, Alex Wang, Adam Poliak, R. Thomas McCoy, Najoung Kim, Benjamin Van Durme, Samuel R. Bowman, Dipanjan Das, and Ellie Pavlick. What do you learn from context? Probing for sentence structure in contextualized word representations. In *International Conference on Learning Representations 2019.* https://openreview.net/forum?id=SJzSgnRcKX

2018   R. Thomas McCoy, Robert Frank, and Tal Linzen. Revisiting the poverty of the stimulus: hierarchical generalization without a hierarchical bias in recurrent neural networks. In *Proceedings of the 40th Annual Conference of the Cognitive Science Society.* https://arxiv.org/abs/1802.09091

2018   Patrick Littell, R. Thomas McCoy, Na-Rae Han, Shruti Rijhwani, Zaid Sheikh, David Mortensen, Teruko Mitamura, and Lori Levin. Parser combinators for Tigrinya and Oromo morphology. In *Language Resources and Evaluation Conference (LREC) 2018.* https://www.aclweb.org/anthology/L18-1611

2018   R. Thomas McCoy and Robert Frank. Phonologically Informed Edit Distance Algorithms for Word Alignment with Low-Resource Languages. In *Proceedings of the Society for Computation in Linguistics (SCiL) 2018*, pages 102-112. http://www.aclweb.org/anthology/W18-0311

2017   Jungo Kasai, Bob Frank, R. Thomas McCoy, Owen Rambow, and Alexis Nasr. TAG parsing with neural networks and vector representations of supertags. In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing*, pages 1712-1722. https://www.aclweb.org/anthology/D17-1180/

2017   Dan Friedman*, Jungo Kasai*, R. Thomas McCoy*, Robert Frank, Forrest Davis, and Owen Rambow. Linguistically Rich Vector Representations of Supertags for TAG Parsing. In *Proceedings of the 13th International Workshop on Tree Adjoining Grammars and Related Formalisms*, pages 122-131. http://www.aclweb.org/anthology/W17-6213
*Equal contribution.

Peer-reviewed journal articles

2020   R. Thomas McCoy, Robert Frank, and Tal Linzen. Does syntax need to grow on trees? Sources of hierarchical inductive bias in sequence-to-sequence networks. *TACL*. https://www.mitpressjournals.org/doi/full/10.1162/tacl_a_00304

Peer-reviewed abstracts

2019   R. Thomas McCoy and Tal Linzen. Non-entailed subsequences as a challenge for natural language inference. *Proceedings of the Society for Computation in Linguistics (SCiL) 2019*. https://scholarworks.umass.edu/scil/vol2/iss1/46/

Papers reviewed by abstract

2017   R. Thomas McCoy. English comparatives as degree-phrase relative clauses. In *Proceedings of the Linguistic Society of America 2*, 26:1-7. https://journals.linguisticsociety.org/proceedings/index.php/PLSA/article/download/4078/3775

Non-peer-reviewed journal articles

2019   R. Thomas McCoy. Touch *down* in Pittsburghese. *Yale Working Papers in Grammatical Diversity*. https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=1002&context=ygdp.

Work in preparation

Susan Hanson, Claire Bowern, and R. Thomas McCoy. A Dictionary and Sketch Grammar of Kuwarra.

Rebecca Everson, R. Thomas McCoy, and Claire Bowern. Creating a semantic database for Pama-Nyungan languages.

Unpublished conference presentations

2018   R. Thomas McCoy, Robert Frank, and Tal Linzen. Investigating hierarchical bias in the acquisition of English question formation with recurrent neural networks. Poster presentation, *2018 Legrain conference: Learning Language in Humans and in Machines*, Paris,France, July 5-6.

2018   Robert Frank, R. Thomas McCoy, and Tal Linzen. Neural network syntax in the age of deep learning: the case of question formation. Oral presentation, *Society for Computation in Linguistics*, Salt Lake City, Utah, January 5.

2017   Patrick Littell, R. Thomas McCoy, and Lori Levin. The North American Computational Linguistics Olympiad. Oral presentation, in Datablitz: Getting High School Students into Linguistics: Current Activities and Future Directions, *Linguistic Society of America Annual Meeting*, Austin, Texas, January 7.

Invited talks

2021   USC ISI Natural Language Seminar. April 15, 2021.
Universal Linguistic Inductive Biases via Meta-Learning.

2020   DeepMind language reading group. December 7, 2020.
Analyzing the syntactic inductive biases of sequence-to-sequence networks.

2020   Berkeley NLP Seminar. October 16, 2020.
Analyzing the syntactic inductive biases of sequence-to-sequence networks.

2020   NLP With Friends seminar series. August 12, 2020.
Universal Linguistic Inductive Biases via Meta-Learning.

Service

2020–present	Johns Hopkins CogSci Representation and Diversity Committee.
2016–2017	Computational Linguistics at Yale (CLAY) reading group: Co-organizer.
2015–2017	Yale Undergraduate Linguistics Society: Co-founder (2015), president (2015–2016), treasurer (2016–2017).

Mentoring: Undergraduate research assistants

2020–present	Adi Yedetore
2019–2020	Michael Lepori

Reviewing

2021	Conference reviewer: EMNLP 2021.
2020	Conference reviewer: CoNLL 2020.
2020	Conference reviewer: EMNLP 2020. Recognized as an outstanding reviewer.
2020	Conference reviewer: ACL 2020.

2019	Conference reviewer: CoNLL 2019.
2018	Conference reviewer: CoNLL 2018.
2018	Conference reviewer: ACL 2018. Recognized as a top reviewer.

OUTREACH

2013-present	North American Computational Linguistics Olympiad (NACLO). National level: Problem writer (12 problems to date) and member of the 7-person NACLO Core governing committee for the national U.S. contest. Local level: Co-founder and co-organizer of the Yale contest site (2013-2017); co-organizer of the Johns Hopkins contest site (2017-present); organizer of pre-contest practice sessions at both sites.
2018–2019	International Linguistics Olympiad (IOL): Problem writer.
2016	Yale Grammatical Diversity Project: Authored two webpages describing regional grammatical phenomena (*All the further* and *Subject contact relatives*).
2013–2017	Linguistics teaching initiatives: Designed and taught a one-lecture linguistics class to high school students in connection with the separate programs Splash, Sprout, and Math Mornings. Presented 8 times to groups ranging from 25 to 50 students.

PROFESSIONAL MEMBERSHIPS

2015–present	Linguistic Society of America (LSA).
2017–present	Association for Computational Linguistics (ACL).
2018–present	Cognitive Science Society.

SKILLS

Programming languages	Python, PyTorch, JavaScript, Haskell, C, Java, R, Scheme.
Natural languages	English (native), Bahasa Indonesia (conversational), Old English (basic reading ability), Old Norse (basic reading ability), Latin (basic reading ability).

COURSEWORK

Undergraduate GPA: 4.0   *Graduate GPA:* 4.0

Computational Linguistics: Language and Computation I, Language and Computation II, Formal Foundations of Linguistic Theories, Computing Meaning

Natural Language Processing: Natural Language Processing, Machine Learning: Linguistic and Sequence Modeling

Syntax: Syntax I, Syntax II, Grammatical Diversity in US English

Phonetics/Phonology: Phonetics, Phonology I, Phonology II, The Phonetics/Phonology Interface

Semantics: Semantics I, Semantics II

Computer Science: Data Structures and Programming Techniques, Computational Tools for Data Science

Mathematics: Multivariable Calculus, Discrete Mathematics, Probability and Statistics, Advanced Statistical Methods

Other relevant courses: Linguistic Field Methods