

Tal Linzen

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ACADEMIC EMPLOYMENT

- 2017- **Assistant Professor**
2016-2017 **Assistant Research Professor**
 Department of Cognitive Science
 Johns Hopkins University
- 2015-2017 **Postdoctoral researcher**
 Laboratoire de Sciences Cognitives et Psycholinguistique & Institut Jean Nicod
 Ecole Normale Supérieure, Paris

EDUCATION

- 2010-2015 **New York University**, Ph.D., Linguistics
 Thesis title: Probabilistic linguistic representations: Between learning and processing
 Committee: Alec Marantz (chair), Gillian Gallagher, Maria Gouskova, Liina Pykkänen,
 Florian Jaeger
- 2008-2010 **Tel Aviv University**, M.A., Linguistics, *summa cum laude*
 Thesis title: Hebrew Possessive Datives: The effects of affectedness
 Advisor: Mira Ariel
- 2005-2010 **Tel Aviv University**, B.Sc., Mathematics & Linguistics, *summa cum laude*

Other courses:

- 2016 Machine Learning Summer School, Cádiz, Spain
2008 Spring School on Linguistic Diversity, Leipzig, Germany

PEER-REVIEWED JOURNAL ARTICLES

- to appear Tal Linzen & Gillian Gallagher. Rapid generalization in phonotactic learning.
 Laboratory Phonology.

- 2016 Tal Linzen, Emmanuel Dupoux & Yoav Goldberg. Assessing the ability of LSTMs to learn syntax-sensitive dependencies. *Transactions of the Association for Computational Linguistics* 4, 521–535.
- 2016 Einat Shetreet, Tal Linzen & Naama Friedmann. Against all odds: Exhaustive activation in lexical access of verb complementation options. *Language, Cognition & Neuroscience* 31(9), 1206–1214.
- 2016 Tal Linzen. The diminishing role of inalienability in the Hebrew Possessive Dative. *Corpus Linguistics and Linguistic Theory* 12(2), 325–354.
- 2016 Tal Linzen & Florian Jaeger. Uncertainty and expectation in sentence processing: Evidence from subcategorization distributions. *Cognitive Science* 40(6), 1382–1411
- 2015 Joseph Fruchter*, Tal Linzen*, Masha Westerlund & Alec Marantz. Lexical Preactivation in Basic Linguistic Phrases. *Journal of Cognitive Neuroscience* 27(10), 1912–1935. (* indicates equal contribution.)
- 2015 Maria Gouskova & Tal Linzen. Morphological conditioning of phonological regularization. *The Linguistic Review* 32(3), 427–473.
- 2015 Mira Ariel, Elitzur Dattner, John W. Du Bois & Tal Linzen. Pronominal datives: The royal road to argument status. *Studies in Language* 39(2), 257–321.
- 2014 Tal Linzen. Parallels between cross-linguistic and language-internal variation in Hebrew possessive constructions. *Linguistics* 52(3), 759–792.
- 2014 Allyson Ettinger, Tal Linzen & Alec Marantz. The role of morphology in phoneme prediction: Evidence from MEG. *Brain and Language* 129, 14–23.
- 2013 Tal Linzen, Alec Marantz & Liina Pylkkänen. Syntactic context effects in single word recognition: An MEG study. *The Mental Lexicon* 8(2), 117–139.
- 2013 Tal Linzen, Sonia Kasyanenko & Maria Gouskova. Lexical and phonological variation in Russian prepositions. *Phonology* 30(3), 453–515.

PROCEEDINGS PAPERS

- 2017 Émile Enguehard, Yoav Goldberg & Tal Linzen. Exploring the syntactic abilities of RNNs with multi-task learning. In *Proceedings of the SIGNLL Conference on Computational Natural Language Learning (CoNLL)*, pages 3–14.
- 2017 Tal Linzen, Noam Siegelman & Louisa Bogaerts (2017). Prediction and uncertainty in an artificial language. In *Proceedings of the 39th Annual Conference of the Cognitive Science Society*, pages 2592–2597.
- 2017 Gaël Le Godais, Tal Linzen & Emmanuel Dupoux. Comparing character-level neural language models using a lexical decision task. In *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL): Volume 2, Short Papers*, pages 125–130.
- 2016 Tal Linzen. Issues in evaluating semantic spaces using word analogies. In *Proceedings of the First Workshop on Evaluating Vector Space Representations for NLP (RepEval)*, pages 13–18.

- 2016 Allyson Ettinger & Tal Linzen. Evaluating vector space models via implicit cognitive measures. In *Proceedings of the First Workshop on Evaluating Vector Space Representations for NLP (RepEval)*, pages 72–77.
- 2016 Tal Linzen, Emmanuel Spector & Benjamin Spector. Quantificational features in distributional word representations. In *Proceedings of the Fifth Joint Conference on Lexical and Computational Semantics (*SEM 2016)*, pages 1–11.
- 2015 Tal Linzen & Timothy J. O’Donnell. A model of rapid phonotactic generalization. In *Proceedings of Empirical Methods in Natural Language Processing (EMNLP 2015)*, pages 1126–1131.
- 2014 Tal Linzen & Florian Jaeger. Investigating the role of entropy in sentence processing. In *Proceedings of the 2014 ACL Workshop on Cognitive Modeling and Computational Linguistics (CMCL)*, pages 10–18.
- 2014 Tal Linzen & Gillian Gallagher. The timecourse of generalization in phonotactic learning. In *Proceedings of Phonology 2013*. (Only the abstract was peer-reviewed.)

INVITED PRESENTATIONS

- 2017 *Cognitive science and neural network models of language*. Workshop on Deep Learning in Computational Cognitive Science at the 39th Annual Meeting of the Cognitive Science Society, London, July 26.
- 2017 *Structure-sensitive dependency learning in recurrent neural networks*:
 TLP seminar at LIMSI (Computer Science Laboratory for Mechanics and Engineering Sciences), Paris-Sud University, June 20.
 Institute for Language, Cognition and Computation (ILCC) seminar, The University of Edinburgh, June 8.
 Colloquium at Tilburg center for Cognition and Communication (TiCC), Tilburg University, The Netherlands, May 31.
- 2017 *Information and representations in the neurobiology of morphology*. Workshop on usage statistics, semantic transparency and segmentability in the selection, access and (de)composition of complex words, University of Freiburg, Germany, May 4-6.
- 2017 *Entropy in language comprehension*. Invited talk at the “Information-theoretic modeling of linguistic variation in context” workshop at the 39. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft (German Linguistics Society), Saarbrücken, Germany, March 9.
- 2017 *Can recurrent neural networks acquire hierarchical representations from natural texts?* Ling Lunch, Paris Diderot University, January 26.
- 2016 *Using English subject-verb number agreement to evaluate the syntactic capabilities of contemporary neural networks*, Ling Lunch, Queen Mary University of London, November 21.
- 2016 *Can contemporary recurrent neural networks learn syntax-sensitive dependencies?* Language Research Cluster, University of Potsdam, Germany, July 6.

- 2016 *Probabilistic computation and formal representations*. Colloquium given at the Department of Linguistics at UCLA, February 22.
- 2016 *Understanding probabilistic prediction in sentence processing*. Colloquium given at the Cognitive Science Department at Johns Hopkins University, January 6.
- 2015 *Understanding probabilistic prediction in sentence processing*. Language Learning and Processing Lab, The Hebrew University of Jerusalem, Israel, December 27.
- 2015 *How might entropy affect comprehension difficulty?* FEAST (Forum Entwicklung und Anwendung von Sprach-Technologien), Saarland University, Germany, December 7.
- 2015 *Generalization in phonotactic learning*:
 Linguistics Seminar, Tufts University, February 17.
 Computational Cognitive Science Group, MIT, February 18.
- 2015 *Probabilistic representations in language: between learning and processing*. Language and Cognition Lab, Stanford University, January 13.
- 2014 *Statistical prediction in language comprehension*. Wohl Institute for Advanced Imaging, Tel Aviv Sourasky Medical Center, Israel, June 2.
- 2014 *Prediction and competition as a window into linguistic representations*. Colloquium given at the Linguistics Department at Tel Aviv University, Israel, May 29.
- 2014 *Competition and prediction in language comprehension*. Language Processing Brown Bag, University of Illinois at Urbana-Champaign, April 10.

CONFERENCE AND WORKSHOP PRESENTATIONS WITHOUT PROCEEDINGS

- 2017 Tal Linzen, Yoav Goldberg and Emmanuel Dupoux. Agreement attraction errors in neural networks. Poster presentation, *30th Annual CUNY Conference on Human Sentence Processing*, Cambridge, MA, March 30–April 1.
- 2016 Ewan Dunbar and Tal Linzen. Three important properties of Bayesian inference. Tutorial, *MFJ Fringe Workshop on Computational Phonology*, Manchester.
- 2016 Tal Linzen. Variation and Change in the Hebrew Dative. Oral presentation, *The Second Usage-Based Linguistics Conference*, Tel Aviv, June 16.
- 2016 Tal Linzen, Timothy J. O'Donnell & Gillian Gallagher. Rapid phonotactic generalization: Behavioral evidence and a Bayesian model. Oral presentation, *LSA 2016 Annual Meeting*, Washington, D.C., January 6–10.
- 2016 Tal Linzen & Yohei Oseki. The reliability of acceptability judgments beyond English. Oral presentation, *LSA 2016 Annual Meeting*, Washington, D.C., January 6–10.
- 2015 Tal Linzen & Timothy J. O'Donnell. A model of rapid phonotactic generalization. Poster, *Workshop on Computational Phonology and Morphology at the Linguistic Summer Institute*, Chicago, July 11.
- 2014 Tal Linzen & Gillian Gallagher. The time course of phonotactic learning. Oral presentation, *Eighth Northeast Computational Phonology Meeting*, New York, November 15.

- 2014 Tal Linzen, Phoebe Gaston, Laura Gwilliams & Alec Marantz. Competition and prediction in the auditory processing of morphologically complex words. Poster, *Sixth Annual Society for the Neurobiology of Language Conference*, Amsterdam, August 27-29.
- 2014 Joseph King, Tal Linzen & Alec Marantz. Noun/verb entropy: An MEG study of word-level syntactic category ambiguity. Poster, *Sixth Annual Society for the Neurobiology of Language Conference*, Amsterdam, August 27-29.
- 2014 Tal Linzen & Gillian Gallagher. The time course of generalization in phonotactic learning. Member abstract presented as a poster, *36th Annual Conference of the Cognitive Science Society*, Québec, Canada, July 23-26.
- 2013 Maria Gouskova & Tal Linzen. Less than words: Morphological effects in lexical variation. Poster, *Phonology 2013*, Amherst, MA, November 8-10.
- 2013 Tal Linzen & Florian Jaeger. Uncertainty and surprisal in sentence processing. Poster, *Architectures and Mechanisms for Language Processing 2013*, Marseille, September 5-7.
- 2013 Tal Linzen, Joseph Fruchter, Masha Westerlund & Alec Marantz. Predicting the foreseeable future: MEG evidence for preactivation of predicted words. Poster, *20th Annual meeting of the Cognitive Neuroscience Society*, San Francisco, April 13-16.
- 2013 Allyson Ettinger, Tal Linzen & Alec Marantz. The role of morphology in phoneme prediction: Evidence from MEG. Poster, *20th Annual meeting of the Cognitive Neuroscience Society*, San Francisco, April 13-16.
- 2013 Tal Linzen, Joseph Fruchter, Masha Westerlund & Alec Marantz. Predicting the foreseeable future: MEG evidence for preactivation of predicted words. Oral presentation, *26th Annual CUNY Conference on Human Sentence Processing*, Columbia, SC, March 21-23.
- 2013 Allyson Ettinger, Tal Linzen & Alec Marantz. The role of morphology in phoneme prediction: Evidence from MEG. Poster, *26th Annual CUNY Conference on Human Sentence Processing*, Columbia, SC, March 21-23.
- 2012 Tal Linzen, Alec Marantz, & Liina Pykkänen. Syntactic effects in single word recognition: Evidence from MEG. Oral presentation, *Eighth Mental Lexicon Conference*, Montreal, October 24-26.
- 2012 Tal Linzen & Masha Westerlund. Predicting the foreseeable future: Do readers use collocational transition probability to predict upcoming words? Oral presentation, *Eighth Mental Lexicon Conference*, Montreal, October 24-26.
- 2012 Tal Linzen, Sonia Kasyanenko & Maria Gouskova. Lexical and phonological variation in Russian prepositions. Oral presentation, *Ninth Old World Conference in Phonology*, Berlin, January 18-21.
- 2011 Tal Linzen, Einat Shetreet & Naama Friedmann. Exploring the neural basis of dependency resolution using coordination sentences. Poster, *Third Annual Neurobiology of Language Conference*, Annapolis, MD, November 10-11.
- 2011 Einat Shetreet, Tal Linzen & Naama Friedmann. The effects of complement predictability on the processing of verbs' complementation options. Poster, *Third Annual Neurobiology of Language Conference*, Annapolis, MD, November 10-11.

- 2011 Einat Shetreet, Tal Linzen & Naama Friedmann. Are all complementation options activated when accessing the verb? Oral presentation, *Structuring the Argument*, Paris. September 5-7.
- 2010 Tal Linzen. Tracking the change in Hebrew possessive constructions using a blog corpus. Poster, *New Ways of Analyzing Variation 40*, Washington, D.C., October 27-30.
- 2010 Tal Linzen. Hebrew statistical linguistics using a morphologically analyzed blog corpus. Oral presentation, *Israeli Seminar on Computational Linguistics*, Tel Aviv, June 16.
- 2010 Tal Linzen. The Hebrew possessive dative: From affectedness to possession. Oral presentation, *Variation and Change in Argument Realization*, Naples, May 27-30.

AWARDS

- 2012 Dean's Travel Grant, New York University
- 2010-2015 Henry M. MacCracken Fellowship, New York University
- 2008-2009 Graduate fellowship, Department of Linguistics, Tel Aviv University
- 2008 Excellence Prize, School of Mathematics, Tel Aviv University
- 2007 Excellence Prize, The Adi Lautman Interdisciplinary Program for Outstanding Students, Tel Aviv University
- 2005-2009 Fellowship, The Adi Lautman Interdisciplinary Program for Outstanding Students, Tel Aviv University

TEACHING

Classes at New York University:

- 2013 Psychology and Neural Science: *Math Tools for Cognitive Science and Neuroscience*. Teaching assistant for Nathaniel Daw.
- 2012 Linguistics: *Language*. Teaching assistant for Maria Gouskova.

Classes at Tel Aviv University:

- 2008 Linguistics: *Foundations of Theoretical Linguistics*. Teaching assistant for Aya Meltzer and Lior Laks.

Other:

- 2013 Statistics workshop, NYU Linguistics (six meetings on regression and mixed-effects modeling in R, co-taught with Sean Martin).

SERVICE

Conference and workshop organizing:

- 2018 Cognitive Modeling and Computational Linguistics, workshop co-located with the Society for Computational in Linguistics and the Linguistics Society of America, Salt Lake City, Utah, January 7 (co-organizer).
- 2017 Cognitive Modeling and Computational Linguistics, workshop co-located with the Conference of the European Chapter of the Association for Computational Linguistics, Valencia, Spain (co-organizer).

Ad-hoc reviewing:

- 2017 Association for Computational Linguistics (ACL); *Neuroscience & Biobehavioral Reviews*; Empirical Methods in Natural Language Processing (EMNLP); Computational Natural Language Learning (CoNLL); Society for the Neurobiology of Language (SNL).
- 2016 *Brain and Language, Cognition* (x3); Computational Natural Language Learning (CoNLL); CUNY Sentence Processing Conference; Deutsche Gesellschaft für Sprachwissenschaft; Empirical Methods in Natural Language Processing (EMNLP); European Association for Computational Linguistics (EACL); *Frontiers in Human Neuroscience*; International Conference on Computational Linguistics (COLING); *Journal of Neuroscience*; Penn Linguistics Colloquium; Usage-Based Linguistics Conference; Society for the Neurobiology of Language (SNL).
- 2015 *Cortex*; Empirical Methods in Natural Language Processing (EMNLP); *Language, Cognition and Neuroscience, Phonology*; Israeli Association for Theoretical Linguistics.
- 2014 *Cognitive Science, Lingua*; Penn Linguistics Colloquium.
- 2013 *Phonology, Language and Cognitive Processes; The Mental Lexicon*.

NON-ACADEMIC EXPERIENCE

- 2006-2012 **Freelance consultant**
Data science, natural language processing, software engineering.
- 2008-2010 **IBM**
Software engineer.
- 2006-2008 **Gita Technologies**
Researcher and software engineer.
- 2004-2006 **Imperva**
Researcher.

LANGUAGES

Hebrew: Native
 English: Fluent
 Spanish, French: Conversational
 Arabic: Reading knowledge
 Italian, Russian, German, Latin: Advanced beginner