

Ewan Dunbar

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Academic Positions

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|---|----------------|
| Assistant Professor | 2020 – Present |
| Department of French, University of Toronto — Toronto, Ontario, Canada | |
| Affiliated Researcher | 2019 – Present |
| Cognitive Machine Learning, Inria – École Normale Supérieure — Paris, France | |
| Maître de conférences (assistant professor) | 2017 – 2020 |
| UFR Linguistique, Université de Paris – Paris Diderot (Paris 7) — Paris, France | |
| Postdoctoral Researcher | 2013 – 2017 |
| Laboratoire de Sciences Cognitives et Psycholinguistique, École Normale Supérieure – PSL* Research University – École des Hautes Études en Sciences Sociales – CNRS — Paris, France | |

Education

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| Ph.D. in Linguistics | 2008 – 2013 |
| University of Maryland, College Park — College Park, MD, USA | |
| Thesis: <i>Statistical Knowledge and Learning in Phonology</i> | |
| Advisors: William Idsardi, Naomi Feldman | |
| M.A. in Linguistics | 2007 – 2008 |
| University of Toronto — Toronto, Ontario, Canada | |
| Thesis: <i>The Acquisition of Morphophonology: A Derivational Framework and Simulation Results</i> | |
| Advisors: Elan Dresher | |
| Hon. B.Sc. in Linguistics and Computing | 2003 – 2007 |
| New College, University of Toronto — Toronto, Ontario, Canada | |

Funded Grants

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|---|-------------|
| Building the Next Generation of Computational Psycholinguistic Models of Speech Perception — Natural Sciences and Engineering Research Council of Canada (NSERC) - Discovery Grant — Principal Investigator — CAD 157,500 | 2022 – 2027 |
| Building a Speech Perception Model Toolbox — Connaught Fund — Principal Investigator — CAD 19,968 | 2022 – 2023 |
| GEOMPHON—Speech Perception and Learning in the Geometric Typology of Phonological Inventories — Agence Nationale de la Recherche, Jeune Chercheur - Jeune Chercheuse — Principal Investigator — EUR 298,900 | 2018 – 2022 |
| Flexi-glot Speech Synthesis for Low-resource and No-resource Settings — Google Faculty Research Award — Co-Principal Investigator (with Emmanuel Dupoux) — USD 41,000 | 2019 – 2020 |
| Acoustic and Semantic Analysis of Animal Vocalization Across Ages — IRIS-PSL Industrial Chair — Co-Principal Investigator (with Emmanuel Chemla, Robin Ryder and Philippe Schlenker) — EUR 100,000 | 2017 – 2019 |

Awards

- Doctoral Award, Social Sciences and Humanities Research Council of Canada. 2011 – 2012
Joseph-Armand Bombardier CGS Master's Scholarship, Social Sciences and Humanities Research Council of Canada. 2007 – 2008
University of Toronto Excellence Award for Undergraduate Research in Social Sciences and Humanities. 2007
University of Toronto Excellence Award for Undergraduate Research in Social Sciences and Humanities (declined). 2006

Publications

Google Scholar ID: [yz1tOxgAAAAJ](https://scholar.google.com/citations?user=yz1tOxgAAAAJ)

2023

1. *A morphological analyzer for Huasteca Nahuatl*.
2023. Ana Tona, Guillaume Thomas, and **Ewan Dunbar**.
Proceedings of the Sixth Workshop on the Use of Computational Methods in the Study of Endangered Languages, 112–116.
2. *Extracting binary features from speech production errors and perceptual confusions using Redundancy-Corrected Transmission*.
2023. Zhanao Fu and **Ewan Dunbar**.
Proceedings of the Society for Computation in Linguistics 6(1), 95–107.

2022

3. *Do self-supervised speech models develop human-like perception biases?*.
2022. Juliette Millet and **Ewan Dunbar**.
Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers), 7591–7605.
4. *Predicting non-native speech perception using the Perceptual Assimilation Model and state-of-the-art acoustic models*.
2022. Juliette Millet, Ioana Chitoran, and **Ewan Dunbar**.
Proceedings of the 25th Conference on Computational Natural Language Learning.
5. *Are word boundaries useful for unsupervised language learning?*.
2022. Tu Anh Nguyen, Maureen De Seyssel, Robin Algayres, Patricia Rozé, **Ewan Dunbar**, and Emmanuel Dupoux.
arXiv preprint arXiv:2210.02956.
6. *Self-supervised language learning from raw audio: Lessons from the Zero Resource Speech Challenge*.
2022. **Ewan Dunbar**, Nicolas Hamilakis, and Emmanuel Dupoux.
IEEE Journal of Selected Topics in Signal Processing 16(6), 1211–1226.
7. *Toward a realistic model of speech processing in the brain with self-supervised learning*.
2022. Juliette Millet, Charlotte Caucheteux, Pierre Orhan, Yves Boubenec, Alexandre Gramfort, **Ewan Dunbar**, Christophe Pallier, and Jean-Remi King.
Advances in Neural Information Processing Systems.
8. *Evaluating context-invariance in unsupervised speech representations*.
2022. Mark Hallap, Emmanuel Dupoux, and **Ewan Dunbar**.
arXiv preprint arXiv:2210.15775.

2021.....

9. *Paraphrases do not explain word analogies.*
2021. Louis Fournier and **Ewan Dunbar**.
Proceedings of the 16th Conference of the European Chapter of the Association for Computational Linguistics 2, 2129–2134.
10. *The Zero Resource Speech Challenge 2021: Spoken language modelling.*
2021. **Ewan Dunbar**, Mathieu Bernard, Nicolas Hamilakis, Tu Anh Nguyen, Maureen de Seyssel, Patricia Rozé, Morgane Rivière, Eugene Kharitonov, and Emmanuel Dupoux.
INTERSPEECH 2021: Twenty-second Annual Conference of the International Speech Communication Association.

2020.....

11. *The Perceptimatic English benchmark for speech perception models.* [code]
2020. Juliette Millet and **Ewan Dunbar**.
Proceedings for the 42nd Annual Meeting of the Cognitive Science Society, 592–597.
12. *Analogies minus analogy test: measuring regularities in word embeddings.* [code]
2020. Louis Fournier, Emmanuel Dupoux, and **Ewan Dunbar**.
Proceedings of the 24th Conference on Computational Natural Language Learning (CoNLL), 365–375.
13. *The Zero Resource Speech Challenge 2020: Discovering discrete subword and word units.*
2020. **Ewan Dunbar**, Julien Karadayi, Mathieu Bernard, Xuan-Nga Cao, Robin Algayres, Lucas Ondel, Laurent Besacier, Sakriani Sakti, and Emmanuel Dupoux.
INTERSPEECH 2020: Twenty-First Annual Conference of the International Speech Communication Association, 4831–4835.
14. *Independent and Automatic Evaluation of Speaker-Independent Acoustic-to-Articulatory Reconstruction.*
2020. Maud Parrot, Juliette Millet, and **Ewan Dunbar**.
INTERSPEECH 2020: Twenty-First Annual Conference of the International Speech Communication Association, 3740–3744.
15. *The Zero Resource Speech Benchmark 2021: Metrics and baselines for unsupervised spoken language modeling.*
2020. Tu Anh Nguyen, Maureen de Seyssel, Patricia Rozé, Morgane Rivière, Evgeny Kharitonov, Alexei Baevski, **Ewan Dunbar**, and Emmanuel Dupoux.
NeurIPS Workshop on Self-Supervised Learning for Speech and Audio Processing.
16. *Modelling perceptual effects of phonology with ASR systems.*
2020. Bing Er Jiang, **Ewan Dunbar**, Morgan Sonderegger, Meghan Clayards, and Emmanuel Dupoux.
Proceedings for the 42nd Annual Meeting of the Cognitive Science Society, 2735–2741.
17. *Perceptimatic: A human speech perception benchmark for unsupervised subword modelling.* [code]
2020. Juliette Millet and **Ewan Dunbar**.
INTERSPEECH 2020: Twenty-First Annual Conference of the International Speech Communication Association, 4881–4885.

2019.....

18. *Mouse tracking as a window into decision making.*
2019. Mora Maldonado, **Ewan Dunbar**, and Emmanuel Chemla.
Behavior research methods 51, 1085–1101.
19. *RNNs implicitly implement tensor product representations.*
2019. R Thomas McCoy, Tal Linzen, **Ewan Dunbar**, and Paul Smolensky.
International Conference on Learning Representations (ICLR).
20. *Generative grammar, neural networks, and the implementational mapping problem: Response to Pater.*
2019. **Ewan Dunbar**.
Language 95(1), e87–e98.
21. *The Zero Resource Speech Challenge 2019: TTS without T.*
2019. **Ewan Dunbar**, Robin Algayres, Julien Karadayi, Mathieu Bernard, Juan Benjumea, Xuan-Nga Cao, Lucie Miskic, Charlotte Dugrain, Lucas Ondel, Alan W Black, and others.
INTERSPEECH 2019: Twentieth Annual Conference of the International Speech Communication Association, 1088–1092.
22. *Comparing unsupervised speech learning directly to human performance in speech perception.*
[code]
2019. Juliette Millet, Nika Jurov, and **Ewan Dunbar**.
Proceedings for the 41st Annual Meeting of the Cognitive Science Society.
23. *Animal linguistics and the puzzle of titi monkeys alarm sequences.*
2019. Mélissa Berthet, Juan Benjumea, Juliette Millet, Cristiane Cäsar, Klaus Zuberbühler, and **Ewan Dunbar**.
Proceedings of the 22nd Amsterdam Colloquium, Amsterdam, Netherlands, 533–542.

2017.....

24. *Learning weakly supervised multimodal phoneme embeddings.*
2017. Rahma Chaabouni, **Ewan Dunbar**, Neil Zeghidour, and Emmanuel Dupoux.
INTERSPEECH 2017: Eighteenth Annual Conference of the International Speech Communication Association, 2218–2222.
25. *The Zero Resource Speech Challenge 2017.*
2017. **Ewan Dunbar**, Xuan Nga Cao, Juan Benjumea, Julien Karadayi, Mathieu Bernard, Laurent Besacier, Xavier Anguera, and Emmanuel Dupoux.
2017 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU), 323–330.

2016.....

26. *Addressing the “two interface” problem: Comparatives and superlatives.*
2016. **Ewan Dunbar** and Alexis Wellwood.
Glossa: a journal of general linguistics.
27. *Finite-state phonology predicts a typological gap in cyclic stress assignment.*
2016. Bronwyn Bjorkman and **Ewan Dunbar**.
Linguistic Inquiry 47(2), 351–363.

28. *Classification and automatic transcription of primate calls*.
2016. Maarten Versteegh, Jeremy Kuhn, Gabriel Synnaeve, Lucie Ravoux, Emmanuel Chemla, Cristiane Căsar, James Fuller, Derek Murphy, Anne Schel, and **Ewan Dunbar**.
The Journal of the Acoustical Society of America 140(1), EL26–EL30.

29. *Geometric constraints on human speech sound inventories*.
2016. **Ewan Dunbar** and Emmanuel Dupoux.
Frontiers in Psychology: Language Sciences.

2015.....

30. *Quantitative methods for comparing featural representations*.
2015. **Ewan Dunbar**, Gabriel Synnaeve, and Emmanuel Dupoux.
ICPhS 2015: 18th Annual Congress of Phonetic Sciences. The Scottish Consortium for ICPhS
2015, ed., International Phonetic Association: London

31. *A hybrid dynamic time warping-deep neural network architecture for unsupervised acoustic modeling*.
2015. Roland Thiolliere, **Ewan Dunbar**, Gabriel Synnaeve, Maarten Versteegh, and Emmanuel Dupoux.
INTERSPEECH 2015: Sixteenth Annual Conference of the International Speech Communication Association, 3179–3183.

2014.....

32. *Self-consistency as an inductive bias in early language acquisition*.
2014. Abdellah Fourtassi, **Ewan Dunbar**, and Emmanuel Dupoux.
Proceedings for the 36th Annual Meeting of the Cognitive Science Society, 469–474.

2013.....

33. *A single-stage approach to learning phonological categories: Insights from Inuktitut*.
2013. Brian Dillon, **Ewan Dunbar**, and William Idsardi.
Cognitive Science 37(2), 344–377.

34. *A summary of the 2012 JHU CLSP workshop on zero resource speech technologies and models of early language acquisition*.
2013. Aren Jansen, Emmanuel Dupoux, Sharon Goldwater, Mark Johnson, Sanjeev Khudanpur, Kenneth Church, Naomi Feldman, Hynek Hermansky, Florian Metze, Richard Rose, and others.
2013 IEEE International Conference on Acoustics, Speech and Signal Processing, 8111–8115.

35. *A Bayesian evaluation of the cost of abstractness*.
2013. **Ewan Dunbar**, Brian Dillon, and William J Idsardi.
Language Down the Garden Path: The Cognitive and Biological Basis for Linguistic Structures, 360–384. Montserrat Sanz, Itziar Laka, and Michael K Tanenhaus, eds

2012.....

36. *The acquisition of phonological inventories*.
2012. **Ewan Dunbar** and William Idsardi.
The Oxford Handbook of Developmental Linguistics, 7–26. Jeffrey L Lidz, William Snyder, and Joe Pater, eds, Oxford University Press: Oxford, UK

2010.....
 37. Review of “A critical introduction to phonology: of sound, mind, and body”.
 2010. **Ewan Dunbar** and William J Idsardi.
Phonology 27, 325–331.

2009.....
 38. *Developing intermediate language learning materials: A Labrador Inuttitut story database*.
 2009. Joan Dicker, **Ewan Dunbar**, and Alana Johns.
Indigenous Language Revitalization: Encouragement, Guidance & Lessons Learned, 155–166. Jon
 Reyhner and Louise Lockard, eds, Northern Arizona University: Flagstaff, AZ

Advising

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| Aixiu An (Postdoctoral researcher) | 2020 |
| Université de Paris, “Abstract effects of inventory geometries” | |
| Amelia Kimball (Postdoctoral researcher) | 2018–2019 |
| Université Paris Diderot, “Perceptual effects of inventory geometries” | |
| Juliette Millet (PhD, co-supervised with Ioana Chitoran) | 2018–2022 |
| Université de Paris, “Speech models for foreign speech perception” | |
| Clément Nguyen (Master’s) | 2021 |
| École Normale Supérieure, “Universal speech synthesis” | |
| Victoria Brami (Master’s, co-supervised with Juliette Millet) | 2021 |
| École Normale Supérieure, “Comparing speech models to human perception” | |
| Louis Bard (Master’s, co-supervised with Juliette Millet) | 2021 |
| École Normale Supérieure, “Using human speech perception constraints to improve speech recognition models” | |
| Louis Fournier (Master’s) | 2020 |
| École Normale Supérieure, “Explaining analogy tests” | |
| Maud Parrot (Master’s) | 2019 |
| École Normale Supérieure, “Reconstitution articulatoire pour modéliser la perception auditive” | |
| Paul Andrey (Master’s) | 2018 |
| École Normale Supérieure, “Neural acoustic-articulatory inversion” | |
| Nika Jurov (Master’s) | 2017–2019 |
| Université Paris Diderot, “Phonetics or phonology? Modelling non-native perception” | |
| Clara Delacourt (Master’s) | 2017–2018 |
| Université Paris Diderot, “Audio-visual perception of speech” | |
| Chloé Gfeller (Master’s, co-supervised with Ioana Chitoran) | 2017–2018 |
| Université Paris Diderot, “Audio-visual perception of speech” | |
| Rahma Chaabouni (Master’s, co-supervised with Neil Zeghidour) | 2016–2017 |
| École Normale Supérieure, “Learning weakly supervised multimodal phoneme embeddings” | |
| Ambroise Petit-Hoang (Master’s) | 2016 |
| École Normale Supérieure, “Modelling of Phonotactics with Neural Networks” | |

Teaching

Computational tools for linguists (graduate) (FRE1149), Instructor, University of Toronto Spring 2021
 Quantitative methods for the study of French (undergrad) (FRE383), Instructor, University of

Toronto Fall 2020
Phonetics and phonology of French (undergrad) (FRE376), Instructor, University of Toronto Fall 2020
Phonetics and phonology of French (undergrad) (FRE376), Instructor, University of Toronto Spring 2020
Phonologie (undergrad) (None), Instructor, University of Toronto Fall 2019
Phonetics and phonology of French (undergrad) (FRE376), Instructor, University of Toronto Fall 2019
Phonetics and phonology of French (undergrad) (FRE376), Instructor, University of Toronto Fall 2019