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**Academic employment and research affiliations**


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- Since 2020.** Assistant professor,  
Department of French, University of Toronto.
- 2017–2020.** *Maître de conférences* (assistant professor),  
UFR Linguistique, Université de Paris – Paris Diderot (Paris 7).  
Member, Laboratoire de Linguistique Formelle (**LLF**: Paris 7/CNRS).  
Member, Cognitive Machine Learning team (**COML**: ENS-PSL/EHESS/CNRS/Inria).  
Member, Labex–EFL (Empirical Foundations of Linguistics) project.
- 2013–2017.** Postdoctoral researcher, Ecole des Hautes Etudes en Sciences Sociales (EHESS)  
Laboratoire de Sciences Cognitives et Psycholinguistique (**LSCP**: ENS, EHESS, CNRS)  
Département des Etudes Cognitives / Institut d'Etude de la Cognition  
Ecole Normale Supérieure / PSL Research University (Paris).
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**Education**


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- 2008–2013.** Ph.D. Linguistics, University of Maryland, College Park.  
Dissertation: *Statistical Knowledge and Learning in Phonology*  
Advisors: William Idsardi, Naomi Feldman.  
University of Maryland Flagship Fellow.  
Participant, University of Maryland IGERT: Biological and Computational  
Foundations of Language Diversity (NSF IGERT DGE-0801465).
- 2007–2008.** M.A. Linguistics, University of Toronto.
- 2003–2007.** Hon. B.Sc. with high distinction,  
Linguistics and Computing (major in Computer Science plus coursework in Linguistics),  
New College, University of Toronto.
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**Funded research projects**


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- 2019–2020.** Flexi-glot speech synthesis for low-resource and no-resource settings. \$41,000. PI.  
Google Faculty Research Award.  
**Team:** One research engineer (*Salah Zaiem*).
- 2018–2021.** GEOMPHON: Speech perception and learning in the geometric typology of  
phonological inventories. €298,900. PI. ANR (French *Agence nationale de la recherche*)  
**Team:** Two post-docs (*Amelia Kimball*, *Aixiu An*), one doctoral student (*Juliette Millet*),  
Master's students and Master's/undergraduate lab interns (*see below*).
- 2017–2018.** Acoustic and semantic analysis of animal vocalization across ages. Secondary PI with  
Emmanuel Chemla, Robin Ryder, and Philippe Schlenker. IRIS-PSL industrial chair.  
**Team:** One post-doc (*Valentin Thouzeau*).
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**Awards**


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

- Fournier, L., Dupoux, E., and **Dunbar, E.** 2020. Analogies minus analogy test: measuring regularities in word embeddings. *CoNLL 2020: The SIGNLL Conference on Computational Natural Language Learning*. Preprint available at <https://arxiv.org/abs/2010.03446>
- Millet, J. and **Dunbar, E.** 2020. Perceptimatic: A human speech perception benchmark for unsupervised subword modelling. *INTERSPEECH 2020: 21st Annual Congress of the International Speech Communication Association*. Preprint at <https://arxiv.org/abs/2010.05961>
- Parrot, M., Millet, J., and **Dunbar, E.** 2020. Independent and automatic evaluation of speaker-independent acoustic-to-articulatory reconstruction. *INTERSPEECH 2020: 21st Annual Congress of the International Speech Communication Association*. Preprint available at <https://arxiv.org/abs/1911.06573>
- Dunbar, E.**, Karadayi, J., Bernard, M., Cao, X-N., Algayres, R., Ondel, L., Besacier, L., Sakti, S., and Dupoux, E.. 2019. The Zero Resource Speech Challenge 2020: Discovering discrete subword and word units. *INTERSPEECH 2020: 21st Annual Congress of the International Speech Communication Association*. Preprint at <https://arxiv.org/abs/2010.05967>
- Jiang, Bing'er, **Dunbar, E.**, Sonderegger, M., Clayards, M., and Dupoux, E. 2020. Modelling perceptual effects of phonology with ASR systems. *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society (Cog Sci 2020)*, pp. 2735-2741. [https://cognitivesciencesociety.org/wp-content/uploads/2020/07/cogsci20\\_proceedings\\_final.pdf](https://cognitivesciencesociety.org/wp-content/uploads/2020/07/cogsci20_proceedings_final.pdf)
- Millet, J. and **Dunbar, E.** 2020. The Perceptimatic English benchmark for speech perception models. *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society (Cog Sci 2020)*. Preprint: <https://arxiv.org/abs/2005.03418/>
- Dunbar, E.** 2019. Generative grammar, neural networks, and the implementational mapping problem. *Language* 95(1) e87–e98. DOI: 10.1353/lan.2019.0013
- Dunbar, E.**, Algayres, R., Karadayi, J., Bernard, M., Benjumea, J., Cao, X-N., Miskic, L., Dugrain, C., Ondel, L., Black, A. W., Besacier, L., Sakti, S., and Dupoux, E.. 2019. The Zero Resource Speech Challenge 2019: TTS without T. *INTERSPEECH 2019: 20th Annual Congress of the International Speech Communication Association*. Preprint available at <https://arxiv.org/abs/1904.11469>
- McCoy, R. T., Linzen, T., **Dunbar, E.**, and Smolensky, P. 2019. RNNs implicitly represent tensor product representations. *ICLR (International Conference on Learning Representations) 2019*. Preprint available at <https://arxiv.org/abs/1812.08718>
- Maldonado, M., **Dunbar, E.**, and Chemla, E. 2019. Mouse tracking as a window into decision making. *Behavior Research Methods* 51(3):1085–1101. DOI: 10.3758/s13428-018-01194-x
- Millet, J., Jurov, N., and **Dunbar, E.** 2019. Comparing unsupervised speech learning directly to human performance in speech perception. *Proceedings of the 41st Annual Meeting of the Cognitive Science Society (Cog Sci 2019)*, July 24-27, Montréal. Preprint DOI: 10.31234/osf.io/ake47
- Dunbar, E.**, Cao, X-N., Benjumea, J., Karadayi, J., Bernard, M., Besacier, L., Anguera, X., and Dupoux, E. 2017. The Zero-Resource Speech Challenge 2017. In *2017 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU)*. DOI: 10.1109/ASRU.2017.8268953 . Preprint available at <https://arxiv.org/abs/1712.04313>

- Chaabouni, R., **Dunbar, E.**, Zeghidour, N., and Dupoux, E. 2017. Learning weakly supervised multimodal phoneme embeddings. In *INTERSPEECH 2017: 18th Annual Conference of the International Speech Communication Association*. Preprint available at <https://arxiv.org/abs/1704.06913>
- Dunbar, E.**, and Dupoux, E. 2016. Geometric constraints on human speech sound inventories. *Frontiers in Psychology: Language Sciences* 7, article 1061. DOI: 10.3389/fpsyg.2016.01061
- Bjorkman, B., and **Dunbar, E.** 2016. Finite-state phonology predicts a typological gap in cyclic stress assignment. *Linguistic Inquiry* 47(2) 353-363. DOI: 10.1162/ling\_a\_00214
- Versteegh, M., Kuhn, J., Synnaeve, G., Ravoux, L., Chemla, E., Cäsar, C., Fuller, J., Murphy, D., Schel, A., and **Dunbar, E.** 2016. Classification and automatic transcription of primate calls. In *Journal of the Acoustical Society of America: Express Letters*. DOI: 10.1121/1.4954887
- Dunbar, E.**, and Wellwood, A. 2016. Addressing the 'two interface' problem: Comparatives and superlatives. *Glossa* 1(1), article 5. DOI: 10.5334/gjgl.9
- Dunbar, E., Synnaeve, G., and Dupoux, E. 2015. Quantitative methods for comparing featural representations. In The Scottish Consortium for ICPHS 2015 (Ed.), *Proceedings of the 18th International Congress of Phonetic Sciences*. Glasgow, UK: The University of Glasgow. Paper number 1024 retrieved from <http://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2015/Papers/ICPHS1024.pdf>
- Thiollière, R.,\* Dunbar, E.,\* Synnaeve, G.,\*** Versteegh, M., and Dupoux, E. 2015. A hybrid dynamic time warping-deep neural network architecture for unsupervised acoustic modeling. In *INTERSPEECH 2015: 16th Annual Conference of the International Speech Communication Association*, September 6-10, Dresden. **\*Joint first authors.**
- Fourtassi, A., **Dunbar, E.**, and Dupoux, E. 2014. Self consistency as an inductive bias in early language acquisition. In *Proceedings of the 36th Annual Conference of the Cognitive Science Society (Cog Sci 2014)*, July 23-26, Québec City. Paper 90 retrieved from <https://mindmodeling.org/cogsci2014/papers/090/paper090.pdf>
- Jansen, A., Dupoux, E., Goldwater, S., Johnson, M., Khudanpur, S., Church, K., Feldman, N., Hermansky, H., Metze, F., Rose, R., Seltzer, M., Clark, P., McGraw, I., Varadarajan, B., Bennett, E., Börschinger, B., Chiu, J., **Dunbar, E.**, Fourtassi, A., Harwath, D., Lee, C.-Y., Levin, K., Norouzian, A., Peddinti, V., Richardson, R., Schatz, T., Thomas, S. 2013. A summary of the 2012 JHU workshop on zero resource speech technologies and models of early language acquisition. In *ICASSP 2013: 2013 IEEE International Conference on Acoustics, Speech and Signal Processing*, May 26-31, Vancouver. DOI: 10.1109/ICASSP.2013.6639245
- Dillon, B.,\* Dunbar, E.,\*** and Idsardi, W. 2013. A single-stage approach to learning phonological categories. *Cognitive Science* 37(2):344–377. DOI: 10.1111/cogs.12008 **\*Joint first authors.**
- Dicker, J., **Dunbar, E.**, & Johns, A. 2009. Developing intermediate language learning materials: A Labrador Inuttitut story database. In J. Reyhner & L. Lockard (Eds.), *Indigenous Language Revitalization: Encouragement, Guidance & Lessons Learned* (pp. 155–166). Flagstaff: Northern Arizona University.

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#### Book chapters

- Dunbar, E.**, and Idsardi, W. 2016. The acquisition of phonological inventories. In Lidz, J., W. Snyder & J. Pater (eds). *Oxford Handbook of Developmental Linguistics*. Oxford: Oxford UP.

Dunbar, E., Dillon, B., and Idsardi, W. 2013. A Bayesian evaluation of the cost of abstractness. In Sanz, M., I. Laka & M. Tanenhaus (eds). *Language Down the Garden Path: The Cognitive and Biological basis for Linguistic Structure*, 360-383. Oxford: Oxford UP.

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#### Reviews

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Dunbar, E., and Idsardi, W. 2010. Review of Daniel Silverman, “A Critical Introduction to Phonology”. *Phonology* 27(2):325–331. DOI: 10.1017/S095267571000014X

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#### Edited volumes

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Bailyn, J., Dunbar, E., LaTerza, C., and Kronrod, Y. (eds). 2012. *Proceedings of FASL 19: The Maryland meeting*. Ann Arbor, MI: Michigan Slavic Publications.

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#### Conference and workshop presentations without proceedings

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Dunbar, E., and Linzen, T. (2016). Three important properties of Bayesian inference. Talk at **MFMM Fringe Workshop on Computational Phonology**, Manchester.

Dunbar, E., and Dupoux, E. (2016). Evidence for two kinds of geometric effects on natural inventories. Talk at **OCP 13** (Old World Conference in Phonology), Budapest.

Dunbar, E., and Dupoux, E. (2015). The typology of inventories: Non-trivial patterns versus non-trivial bias. Talk at **DGfS** (Deutsche Gesellschaft für Sprachwissenschaft), Leipzig.

Bjorkman, B., and Dunbar, E. (2015). Eliminating cyclicity: A reanalysis of Chamorro stress. Poster at **LSA** (Linguistic Society of America), Portland.

Dunbar, E., Dillon, B., and Idsardi, W. (2012). Learning inventories by learning allophony and vice versa. Presented at **GLOW 35** (Generative Linguistics in the Old World), Potsdam.

Dunbar, E. (2012). Simplicity in grammar and the Bayesian evaluation measure. Presented at **NECPhon 6** (Northeast Computational Phonology), University of Maryland.

Dunbar, E., Dillon, B., and Idsardi, W. (2011). Unsupervised phoneme discovery in Turkish: Very large is not enough. Presented at **New Tools and Methods for Very-Large-Scale Phonetics Research**, University of Pennsylvania.

Dunbar, E., Dillon, B., and Idsardi, W. (2010). Bayesian learning of allophones. Presented at **Northeast Computational Phonology (NECPhon) 4**, U. of Massachusetts, Amherst.

Dillon, B., Dunbar, E., and Idsardi, W. (2010). A single-stage computational model of phoneme category acquisition. Presented at **Computational Modeling of Sound Pattern Acquisition Workshop**, University of Alberta.

Dunbar, E. (2009). Pitfalls of distributional allophone learning. Presented at the **Montreal-Ottawa Toronto Workshop in Phonology (MOT)**, Toronto, Ontario, Canada.

Dillon, B., Dunbar, E., and Idsardi, W. (2009). Seeing through the surface: A model for direct acquisition of phoneme categories. Presented at **Boston University Conference on Language Development (BUCLD)**.

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#### Committee membership and hosting of research activities

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2020–. Member, curriculum committee, Department of French.

2018–2020. Member, conseil du laboratoire (advisory body for the lab), LLF.

2016. Organizer, Workshop on representational analysis for neural networks, ENS, March 24, 2016.

2011–2012. Organizing committee, Mayfest 2012 Workshop, *The role of computational models in*

*linguistic theory* (two-day workshop). Department of Linguistics, University of Maryland.

2011. Organizing committee, Mid-Atlantic Student Colloquium on Speech, Language and Learning (one-day conference). Johns Hopkins University, September 23, 2011.
- 2010–2011. Organizer, IGERT lunch talk series (weekly seminar series). University of Maryland.
2010. Organizing committee, FASL 19: Formal Approaches to Slavic Linguistics (three-day international conference). University of Maryland, April 23–25, 2011.
- 2009–2011. Organizer, colloquium series. Department of Linguistics, University of Maryland.
- 2010–2011. Selection committee member, Graduate Mentor of the Year Award (special award given by the university to thesis supervisors, nominated by students). University of Maryland.

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### Teaching

*L3: Licence 3 (third year of undergraduate degree); M1: Master 1 (first year of two-year Master's programme); M2: Master 2 (second year of two-year Master's programme)*

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- Fall 2020.** *Quantitative methods for the study of French.* Dept. of French, University of Toronto.
- Fall 2020.** *Phonetics and phonology of French.* Dept. of French, University of Toronto.
- Spring 2020.** *Phonologie* [Phonology]. **L3** Language Sciences, U. Paris (co-taught, Ioana Chitoran).
- Fall 2019.** *Statistiques descriptives* [Descriptive Statistics]. **M1/M2** Language Sciences, U. Paris.
- Fall 2019.** *Raisonnement statistique* [Statistical Reasoning]. **M1/M2** Language Sciences, U. Paris.
- Fall 2019.** *Méthodes expérimentales et psycholinguistique* [Experimental Methods and Psycholinguistics]. **L3** Language Sciences, U. Paris (co-taught, Céline Pozniak).
- Fall 2017, Fall 2018, Fall 2019.** *Phonologie* [Phonology]. **M1** Language Sciences, U. Paris Diderot.
- Spring 2018, Spring 2019.** *Méthodes expérimentales en linguistique* [Experimental Methods in Linguistics]. **L3** Language Sciences, U. Paris Diderot.
- Spring 2018, Spring 2019.** *Phonologie 2* [Phonology 2]. **L3** Language Sciences, U. Paris Diderot.
- Fall 2017, Fall 2018.** *Statistique* [Statistics]. **M2** Language Sciences, U. Paris Diderot.
- Fall 2017.** *Phonologie 1* [Phonology 1]. **L3** Language Sciences, U. Paris Diderot.
- Fall 2016.** *Atelier d'initiation à la programmation niv. 2* [Introductory Programming Workshop, lev. 2]. **M1** Cognitive Science, Ecole Normale Supérieure. Teaching assistant.
- Spring 2016.** *Topics in phonology.* **M1** Linguistics, Ecole Normale Supérieure. Guest lecture on theoretical computational phonology.
- Summer 2015.** *Computational phonology.* European Generative Grammar (EGG School), Brno. Summer school course for linguistics students (undergraduate to PhD).
- Spring 2012.** *Discrete mathematical models of grammatical structure.* **Undergraduate.** Department of Linguistics, U. of Maryland. Fourth-year course, computational phonology.
- Fall 2010, Fall 2011.** *Phonology I.* **Undergraduate.** Linguistics, U. of Maryland. Teaching assistant.
- Fall 2009.** *Introduction to language.* **Undergraduate.** Linguistics, U. of Maryland. Teaching assistant.
- Fall 2007.** *Field methods.* **Undergraduate.** Linguistics, U. of Toronto. Teaching assistant.

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### Direct supervision of PhD theses, Master's theses, and Master's research internships

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- 2018–2021.** Juliette Millet. **PhD thesis.** (U. Paris / FIRE Graduate School; co-supervised w. Ioana Chitoran). *Large scale unsupervised speech models of foreign-language speech perception.*
- 2018–2019.** Nika Jurov. **M2 thesis.** (U. Paris Diderot). *Phonetics or phonology? Modelling non-native perception.*
- 2019.** Elisa Lannelongue. **M1 research internship.** (ENS/LLF). *Prédictions d'une étude acoustique*

*sur l'adaptation des phonèmes en langue étrangère.*

- 2018.** Paul Andrey. **M2 research internship.** (LSCP, 6 months, co-supervised w. A. Guevara-Rukoz and E. Dupoux). *Neural acoustic-articulatory inversion.*
- 2017-2018.** Clara Delacourt. **M1 thesis.** (U. Paris Diderot). *Audio-visual perception of speech.*
- 2017-2018.** Chloé Gfeller. **M2 thesis.** (U. Paris Diderot). *Positional allophony in ejective stops: A case study of Georgian.*
- 2017-2018.** Nika Jurov. **M1 thesis.** (U. Paris Diderot). *Second-language speech perception modelling.*
- 2016-2017.** Rahma Chaabouni. **M2 research internship.** (LSCP, 6 months, co-supervised w. E. Dupoux and N. Zeghidour.). *Learning weakly supervised multimodal phoneme embeddings.*
- 2016.** Ambroise Petit-Hoang. **M2 research internship** (LSCP, 6 months, co-supervised with E. Dupoux). *Modelling of Phonotactics with Neural Networks.*

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### Other supervision

- 2019.** Maud Parrot. **M2 research internship.** (COML, 4.5 months; PI; direct supervisor, J. Millet). *Reconstitution articuloire pour modéliser la perception auditive.*
- 2019.** Beyza Taşdelen. **L3 lab internship.** (LLF; PI; direct supervisor, J. Millet). Utilities for experimental stimulus and list development.
- 2019.** Adèle Richard. **L3 lab internship.** (LLF; PI; direct supervisor, A. Kimball). Utilities for experimental stimulus and list development.
- 2019.** Nicolas Brassat. **L3 lab internship.** (LLF; PI; direct supervisor, A. Kimball). Utilities for experimental stimulus and list development.
- 2019.** Melisa Khemmanivong. **L3 lab internship.** (LLF). Phonetic annotation and correction of annotations of spontaneous speech.
- 2018-2019.** Charlotte Dugrain. **M1 lab internship.** (COML). Corpora and evaluation tools for ZeroSpeech 2019 challenge.
- 2018.** Lucie Miskic. **M1 lab internship.** (COML). Evaluation tools for ZeroSpeech 2019 challenge.
- 2018.** Sébastien Gadioux. **L3 lab internship.** (LLF). Computational utilities for inventory typology.
- 2015, 2016.** Mini-projects. (Ecole Normale Supérieure, 1 week, for incoming students).  
2016: Samuel Delbecq, Tomas Rigaux, Haowen Zhang. 2015: Antonin Affholder, Noémi Fong. *Google peut-il réussir un test QI ?*
- 2011.** Jesse Shawl. **Honors thesis.** (U. of Maryland, co-supervised with W. Idsardi). *Statistical Learning of Spanish Vowel Categories.*

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### PhD Thesis Committees

- 2019.** Margaux Romand-Monnier (ENS / U. Paris / FIRE Graduate School). **Defence committee; thesis advisory committee.** *Functional and structural brain adaptations to changing and uncertain environments in humans.*
- 2019.** Camila Scaff (ENS / FIRE Graduate School). **Defence committee.** *Beyond WEIRD: an interdisciplinary approach to language acquisition.*
- 2019.** Anisia Popescu (U. Paris Diderot). **Defence committee.** *Organisation temporelle des gestes articulatoires des liquides en syllabes complexes.*

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### Taught workshops

- 2016, 10h.** *Introduction to statistics with SPSS.* Invited workshop, U. of Kent.
- 2012, 6h.** *Introduction to statistics with R.* Workshop, U. of Maryland.
- 2011, 10h.** *Introduction to statistics with R.* Workshop, U. of Maryland.

**2010, 2h.** *Introduction to R.* Workshop at Second Language Research Forum conference.  
**2010, 10h.** *Introduction to statistics with R.* Invited workshop, Stony Brook University.