

# Meaghan Fowlie

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<http://meaghanfowlie.com>

**Current Position:** PostDoc at Saarland University, Department of Language Science and Technology

## Relevant work experience:

- |         |  |                    |
|---------|--|--------------------|
| 2015-16 | Researcher, Instructor, McGill Ergativity Lab coordinator      | McGill Linguistics |
| 2010-15 | Research assistant, programmer, teaching assistant, instructor | UCLA Linguistics   |

## Education

### Degrees:

- |      |                                |             |
|------|--------------------------------|-------------|
| 2017 | PhD, UCLA                      | Linguistics |
| 2007 | First class honours BA, McGill | Linguistics |

### Math and Computer Science Courses:

- |                     |   |
|---------------------|---|
| Mathematics:        | senior calculus & abstract algebra, linear algebra, graduate mathematical linguistics                                       |
| Computer Science:   | Computational linguistics, Learnability, CompSci 101, NAASSLI courses on Haskell, sentiment analysis, & machine translation |
| Mathematical Logic: | Beginner and intermediate logic, natural logic  |

## Programming:

- ▷ Java: contributor to [Alto Parser tool for IRTGs](#)
- ▷ Python: [Hopcroft's algorithm](#); [Clark & Thollard 2004 PDFa learner](#); basics of Pytorch and TensorFlow
- ▷ OCaml: [Minimalist Grammar with Adjunction](#); [Minimalist multidominance](#); [probabilistic CKY parser](#)
- ▷ PHP, HTML, MySQL, CSS, Javascript: [McGill Ergativity Survey](#)
- ▷ **Tools:**  $\LaTeX$ , Markdown, basic Bash, svn, git, mercurial, Jupyter Notebooks

## Research skills

- ▷ Formulate research questions and hypotheses
- ▷ Design experiments
- ▷ Create mathematical models of phenomena
- ▷ Code implementations of models
- ▷ Analyse data
- ▷ Write and publish results

## Qualities

### *Fast learner*

- ▷ PhD and Honours BA in an intellectually demanding field (i.e. computational linguistics)
- ▷ Conducted research using machine learning to examine grammatical patterns in birdsong (see below). Machine learning was entirely new to me at the beginning of the project.
- ▷ Numerous academic awards including the UCLA Dissertation Year Fellowship (2014) and Diebold Fellowship (2009), collectively worth 3 years' fees and salary

### *Scientifically creative: diverse and innovative research program*

- ▷ 8 published papers on 7 topics (5 peer-reviewed [\[1\]](#) [\[2\]](#) [\[3\]](#)/[\[3pub\]](#) [\[4\]](#) [\[5\]](#)/[\[5pub\]](#)) [\[6\]](#) [\[7\]](#) [\[8\]](#)
- ▷ Part of an interdisciplinary NSF-funded project *Mapping the Acoustic Communication Networks of Birds* bringing together biologists, computational linguists, and neuroscientists to explore the grammar of birdsong
- ▷ Linguistic research bridging theoretical linguistics, mathematics and computer science
- ▷ Conducted the first artificial language learning experiment on how humans learn adjectives and adverbs
- ▷ Interest in neuroscience, music and language: attended Ebramus conferences on the neuroscience of music, organised a reading group at UCLA on music and language, and took a UCLA course on neuroimaging

- ▷ Presented at academic conferences about syntax, phonology, mathematical linguistics, computational linguistics, and birdsong

### ***Good communication skills***

- ▷ Excellent teaching record:
  - Taught 4 courses, teaching assistant in 8 (2010-present)
  - 8.1/9 mean teaching evaluation at UCLA, 4.2/5 at McGill
- ▷ Sole instructor for four classes (2015-present). Duties include syllabus design, preparing 2-4 hours per week of lectures, creating homework and tests, and guiding students in final projects
- ▷ Supervised 2 BSc theses (2017-pres), taught a graduate student in an independent study course (2015)
- ▷ Supervised three research assistants (2015-2016)
- ▷ Organised a research lab and a reading group
- ▷ 5 invited talks (UCLA, MIT, ISAIM, McGill, Concordia (Montreal))
- ▷ 6 additional conference presentations, including GLOW 2008

### **Phonetics skills**

- ▷ Spectrogram and waveform reading
- ▷ Knowledge of the full International Phonetic Alphabet (IPA)
- ▷ Articulatory phonetics (how the vocal tract works)
- ▷ Phonological theory
- ▷ Language-specific knowledge of English phonetics and phonology
- ▷ Top score (*high pass*) on UCLA phonetics production and perception test
- ▷ Phonetics, phonology, and English as a second language teaching

### **Experimental research**

- ▷ Designed and conducted linguistics experiments, online and in person
  - Participant recruitment
  - Online questionnaire programming
  - Ethics approval process
  - Experimental and stimulus design, statistical analysis, result interpretation
- ▷ UCLA linguistics experimental methods class
- ▷ Basic R

### **Machine Learning Experience**

- 2017-present Grammar induction, inducing synchronously from syntactic and semantic representations: project with Alexander Koller's lab at Saarland University
- 2013-present Work on *Mapping the Acoustic Communication Networks of Birds*, an NSF-funded project with Charles Taylor, Edward Stabler, Floris van Vugt, and Martin Cody. I implemented an expectation maximisation algorithm (the inside-outside algorithm) for estimating rule probabilities in a context-free grammar, extending it to a class of context-sensitive grammars that have copying.
- 2014 Paper published in the UCLA Working Papers in Linguistics (*Learning Adjuncts*) on how several existing language learning algorithms handle repetition and optionality
- 2014 Implemented a probabilistic finite state automaton learning algorithm
- 2013 Class on formal learnability theory, focusing on Gold and PAC type learners
- 2013 Implemented a probabilistic CKY parser
- 2012 Attended the North American Summer School of Logic, Language, and Information, taking classes in sentiment analysis and machine translation

**Languages:** Canadian English (native), French (fairly fluent), Dutch (intermediate), German (A2)