Bozena Pajak

Duolingo, Inc.
5900 Penn Avenue
Pittsburgh, PA 15206

Twitter: @BozenaPajak
E-mail: bozena@duolingo.com
Website: http://bpajak.github.io

Professional Positions

2018–	Staff Learning Scientist, Duolingo, Inc.
2017–2018	Senior Learning Scientist, Duolingo, Inc.
2015–2016	Learning Scientist, Duolingo, Inc.
2014–2015	Research Associate & Lecturer, Department of Linguistics, Northwestern University
2012–2014	Postdoctoral Fellow, Center for Language Sciences, Department of Brain & Cognitive Sciences, University of Rochester

Education

Ph.D. Linguistics, University of California, San Diego, 2012

> *Thesis:* Inductive Inference in Non-Native Speech Processing and Learning
>
> *Committee:* Eric Baković (co-chair), Roger Levy (co-chair), Sarah C. Creel, Victor Ferreira, Tamar Gollan, Sharon Rose

Linguistic Society of America Summer Institute, University of California, Berkeley, 2009

M.A. Linguistics, University of California, San Diego, 2008

M.A. Sociology, Jagiellonian University (Kraków, Poland), 2006

M.A. International Relations, Jagiellonian University (Kraków, Poland), 2005

Honors and Awards

University of Rochester Center for Language Sciences NIH Post-Doctoral Fellowship: 2012-2013, 2013-2014

UC San Diego Center for Research in Language NIH Pre-Doctoral Fellowship: 2010-2011, 2011-2012

E. Bates Graduate Research Award from the UC San Diego Center for Research in Language: 2011

UC San Diego Dean of Social Sciences Travel Fund Award: 2010, 2011

UC San Diego Department of Linguistics TA Excellence Award: 2009, 2010

Linguistic Society of America Summer Institute Fellowship: 2009

UC San Diego Department of Linguistics Research and Travel Grant Award: 2007-2012 (yearly award)

Jagiellonian University Scholarship to complete a study abroad program at L'Institut d'Études Politiques de Bordeaux: 2005

Sapere Auso Foundation Award for exceptional educational activity: 2004

Honors and Awards (continued)

Antioch College & Jagiellonian University Scholarship to complete a study abroad program at Antioch College: 2002

Jagiellonian University Scholarship for excellent academic achievements: 2001-2004

Publications

in prep.   Martin, Jaycie R., Fedzechkina, Maryia, **Pajak, Bozena**, & Jaeger, T. Florian
             "L1 distance effects on L2 word order acquisition: A miniature language study."

in revision **Pajak, Bozena**, Klinton Bicknell, & Roger Levy. "Analogical reuse of newly learned
             phonetic categories: a computational model and experimental investigation." Submitted to
             Cognitive Science.

2016   **Pajak, Bozena**, Sarah C. Creel, & Roger Levy. "Difficulty in learning similar-sounding
             words: a developmental stage or a general property of learning?" *Journal of Experimental
             Psychology: Learning, Memory, and Cognition, 42.* 1377–1399.

2016   **Pajak, Bozena**, Alex B. Fine, Dave Kleinschmidt, & T. Florian Jaeger. "Learning
             additional languages as hierarchical inference: insights from first language processing."
             Language Learning, 66. 900–944.

2014   **Pajak, Bozena** & Roger Levy. "The role of abstraction in non-native speech perception."
             Journal of Phonetics, 46. 147–160.

2013   **Pajak, Bozena**, Klinton Bicknell, & Roger Levy. "A model of generalization in distributional
             learning of phonetic categories." In *Proceedings of the 4th Workshop on Cognitive Modeling
             and Computational Linguistics* (CMCL 2013). Sofia, Bulgaria: Association for Computational
             Linguistics.

2013   **Pajak, Bozena**. "Non-intervocalic geminates: typology, acoustics, perceptibility." In
             L. Carroll, B. Keffala, & D. Michel (Eds.), *San Diego Linguistics Papers 4* (pp. 2–27). San
             Diego, CA: UC San Diego.

2012   **Pajak, Bozena**, Sarah C. Creel, & Roger Levy. "Can native-language perceptual bias
             facilitate learning words in a new language?" In N. Miyake, D. Peebles, & R. P. Cooper (Eds.),
             Proceedings of the 34th Annual Conference of the Cognitive Science Society (pp. 2174–2179).
             Austin, TX: Cognitive Science Society.

2012   **Pajak, Bozena** & Roger Levy. "Distributional learning of L2 phonological categories by
             listeners with different language backgrounds." In A. K. Biller, E. Y. Chung, & A. E. Kimball
             (Eds.), *Proceedings of the 36th Boston University Conference on Language Development*
             (BUCLD) (pp. 400–413). Somerville, MA: Cascadilla Press. (18% acceptance rate)

2011   **Pajak, Bozena** & Roger Levy. "How abstract are phonological representations? Evidence
             from distributional perceptual learning." In *Proceedings of the 47th Annual Meeting of the
             Chicago Linguistic Society* (CLS). Chicago, IL: University of Chicago. (22.5% acceptance rate)

2011   **Pajak, Bozena** & Roger Levy. "Phonological generalization from distributional evidence."
             In L. Carlson, C. Hölscher, & T. Shipley (Eds.), *Proceedings of the 33rd Annual Conference
             of the Cognitive Science Society* (pp. 2673–2678). Austin, TX: Cognitive Science Society.
             (32% acceptance rate)

Publications (continued)

2010   **Pajak, Bozena** & Eric Baković. "Assimilation, antigemination, and contingent optionality: the phonology of monoconsonantal proclitics in Polish." *Natural Language and Linguistic Theory, 28*(3). 643–680.

2010   **Pajak, Bozena**. "Perceptual advantage from generalized linguistic knowledge." In S. Ohlsson & R. Catrambone (Eds.), *Proceedings of the 32nd Annual Conference of the Cognitive Science Society* (pp. 369–374). Austin, TX: Cognitive Science Society.

2010   **Pajak, Bozena**. "Contextual constraints on geminates: the case of Polish." In *Proceedings of the 35th Annual Meeting of the Berkeley Linguistics Society* (BLS) (pp. 269–280). Berkeley, CA: University of California, Berkeley.

2007   **Pajak, Bozena**. "Polish clitics: consequences for the analysis of optionality in OT." In *Proceedings of the 37th Western Conference on Linguistics* (WECOL) (pp. 173–188). San Diego, CA: University of California, San Diego. (26% acceptance rate)

2006   Rubio, Manuel & **Pajak, Bozena**. "Fibonacci numbers using mutual recursion." In *Proceedings of Koli Calling 2005: 5th Annual Finnish/Baltic Sea Conference on Computer Science Education* (pp. 174–177). Finland: TUCS General Publications.

Invited Presentations

2018   "Duolingo: Jobs in EdTech." Invited keynote talk at Harvard University's panel on "Linguistics Careers in Industry". Cambridge, MA. (February)

2018   "Research at Duolingo." Invited talk at MIT's Computational Psycholinguistics Laboratory, Department of Brain and Cognitive Sciences. Cambridge, MA. (February)

2016   "Duolingo: Improving classroom language learning with personalized instruction." Invited keynote talk at the Vanderbilt University Center for Second Language Studies Fall Orientation Event. Nashville, TN. (August)

2015   "Phonetic category learning with implicit expectations about analogous categories." Invited talk at the University of Pittsburgh Linguistics Colloquium. Pittsburgh, PA. (November)

2015   "Second language acquisition: generalization in morphological learning" Invited talk at the Northwestern University Undergraduate Research Forum. Chicago, IL. (May)

2014   "Phonetic category learning with implicit expectations about analogous categories." Invited talk at the Northwestern University Linguistics Colloquium. Chicago, IL. (November)

2014   "Phonetic category learning with implicit expectations about analogous categories." Invited talk at the Stanford Psychology Cognitive Area talk series. Palo Alto, CA. (May)

2013   "Modeling generalization in distributional learning of phonetic categories." Invited talk at the UCLA Psycholinguistics Seminar (PsychoBabble). Los Angeles, CA. (January)

2012   "The role of inductive inference in non-native speech processing." Invited talk at the Center for Language Sciences (CLS), University of Rochester. Rochester, NY. (April)

Conference Presentations

2018   Martin, Jaycie R., **Pajak, Bozena**, & Fedzechkina, Maryia. "(Over-)generalization of L1-to-L2 similarity: interference during L2 word order learning." Presentation at the 2nd International Symposium on Bilingual Processing in Adults and Children Braunschweig, Germany. (May)

2018   Hosier, Jordan, **Pajak, Bozena**, Bradlow, Ann R., & Bicknell, Klinton. "Generalization in foreign accent adaptation is predicted by similarity of segmental errors across talker." Poster presentation at the 175th Meeting of the Acoustical Society of America (ASA). Minneapolis, MN. (May)

2018   Martin, Jaycie R., **Pajak, Bozena**, & Fedzechkina, Maryia. "(Over-)generalization of L1-to-L2 similarity: interference during L2 word order learning." Presentation at the 92nd Annual Meeting of the Linguistic Society of America. Salt Lake City, UT. (January)

2017   Martin, Jaycie R., **Pajak, Bozena**, & Fedzechkina, Maryia. "L1-L2 similarity causes over-generalization in L2 word order learning: evidence from a miniature artificial language." Presentation at the Arizona Linguistics Circle 11. Tucson, AZ. (October)

2016   **Pajak, Bozena**. "Duolingo: Improving classroom language learning with personalized instruction." Poster presentation at the Northwestern University Event "The Future of Language Science. A Celebration of 50 Years of Linguistics at Northwestern". Evanston, IL. (September)

2015   **Pajak, Bozena**. "Analogy in learning second-language phonetic categories." Oral presentation at the 37th Annual Meeting of the Cognitive Science Society. Pasadena, CA. (July)

2014   **Pajak, Bozena**, Page Piccinini, & Roger Levy. "Perceptual warping of phonetic space applies beyond known phonetic categories: evidence from the perceptual magnet effect." Poster presentation at the 168th Meeting of the Acoustical Society of America (ASA). Indianapolis, IN. (October)

2013   K. Michael Brooks, **Bozena Pajak**, & Eric Baković. "Learning biases for phonological interactions." Poster presentation at Phonology 2013. Amherst, MA. (November)

2013   **Pajak, Bozena**, Klinton Bicknell, & Roger Levy. "A computational model of generalization in phonetic category learning." Oral presentation at the 38th Boston University Conference on Language Development (BUCLD). Boston, MA. (November)

2013   **Pajak, Bozena**, Klinton Bicknell, & Roger Levy. "A model of generalization in distributional learning of phonetic categories." Oral presentation at the 4th Workshop on Cognitive Modeling and Computational Linguistics (CMCL 2013). Sofia, Bulgaria. (August)

2013   **Pajak, Bozena**, Klinton Bicknell, & Roger Levy. "A computational model of generalization in distributional learning: the role of phonetic variability across segment classes." Poster presentation at the 2013 Linguistic Institute Workshop on Variation in the Acquisition of Sound Systems. Ann Arbor, MI. (June)

2013   **Pajak, Bozena** & Roger Levy. "Distributional learning of non-native phonetic categories: the role of talker variability." Oral presentation at the 87th Annual Meeting of the Linguistic Society of America. Boston, MA. (January)

2013   K. Michael Brooks, **Bozena Pajak**, & Eric Baković. "Learnability of complex phonological interactions: an artificial language learning experiment." Oral presentation at the 87th Annual Meeting of the Linguistic Society of America. Boston, MA. (January)

Conference Presentations (continued)

2012   **Pajak, Bozena**, Sarah C. Creel, & Roger Levy. "Can native-language perceptual bias facilitate learning words in a new language?" Poster presentation at the 34th Annual Meeting of the Cognitive Science Society. Sapporo, Japan. (August)

2012   **Pajak, Bozena**, Sarah C. Creel, & Roger Levy. "Adults take advantage of fine phonetic detail when learning words in a novel language." Oral presentation at the 86th Annual Meeting of the Linguistic Society of America. Portland, OR. (January)

2011   **Pajak, Bozena** & Roger Levy. "Distributional learning of L2 phonological categories by listeners with different language backgrounds." Oral presentation at the 36th Boston University Conference on Language Development (BUCLD). Boston, MA. (November)

2011   **Pajak, Bozena** & Roger Levy. "Phonological generalization from distributional evidence." Oral presentation at the 33rd Annual Meeting of the Cognitive Science Society. Boston, MA. (July)

2011   **Pajak, Bozena** & Roger Levy. "How abstract are phonological representations? Evidence from distributional perceptual learning." Oral presentation at the 47th Annual Meeting of the Chicago Linguistic Society (CLS). Chicago, IL. (April)

2010   **Pajak, Bozena**. "Bilinguals generalize from known phonological contrasts in perception of a novel language." Poster presentation at the 51st Annual Meeting of the Psychonomic Society. St. Louis, MO. (November)

2010   **Pajak, Bozena**. "Perceptual advantage from generalized linguistic knowledge." Oral presentation at the 32nd Annual Meeting of the Cognitive Science Society. Portland, OR. (August)

2010   **Pajak, Bozena**. "L2 knowledge facilitates perception of L3." Oral presentation at the 84th Annual Meeting of the Linguistic Society of America. Baltimore, MD. (January)

2009   **Pajak, Bozena**. "Perception of Moroccan Arabic geminates by native English speakers." Poster presentation at the 2nd Acoustical Society of America Special Workshop on Speech: Cross-language speech perception and variations in linguistic experience. Portland, OR. (May)

2009   **Pajak, Bozena**. "Contextual constraints on geminates: the case of Polish." Oral presentation at the 35th Annual Meeting of the Berkeley Linguistics Society (BLS). Berkeley, CA. (February)

2009   **Pajak, Bozena**. "Context-dependent perception of geminates." Poster presentation at the 83rd Annual Meeting of the Linguistic Society of America. San Francisco, CA. (January)

2008   **Pajak, Bozena**. "Perception of sibilant geminates by non-native listeners." Oral presentation at the Southern California Workshop on Phonetics/Phonology. Pomona College, CA. (November)

2008   Baković, Eric & **Pajak, Bozena**. "Why and how not to counterbleed." Oral presentation at the Workshop on Phonological Variation in Voicing. Amsterdam, The Netherlands. (September)

2008   Baković, Eric & **Pajak, Bozena**. "Contingent optionality." Oral presentation at the Annual Meeting of the Linguistic Society of America. Chicago, IL. (January)

2007   **Pajak, Bozena**. "Polish clitics: consequences for the analysis of optionality in OT." Oral presentation at the 37th Western Conference on Linguistics (WECOL). San Diego, CA. (December)

Bozena Pajak

Teaching Experience

Lecturer

Cognitive Science Program, Northwestern University
 COGSCI 366: Cognitive Science Proseminar   Spring-15

Department of Linguistics, Northwestern University
 LING 250: Sound Patterns in Human Language   Winter-15
 LING 321: Bilingualism   Fall-14
 LIGN 111: Phonology   Winter-11

Guest Lecturer

Department of Linguistics, Northwestern University
 LING 334: Introduction to Computational Linguistics   May, 2014
  Two lectures on "Good programming practices"

Department of Brain & Cognitive Sciences, University of Rochester
 BCS 111: Foundations of Cognitive Science   February, 2014
  Lecture on "Language acquisition"
 BCS 259: Language Development   April, 2013
  Lecture on "Bilingual first language acquisition"
 HLP Lab Undergraduate Research Assistant Reading Group   April, 2013
  Lecture on "Second language acquisition"
 BCS 152: Language & Psycholinguistics   November, 2012
 Lecture on "Multilingualism"

Head Teaching Assistant, Linguistics Language Program, UC San Diego
 Developing materials & supervising instructors of
 LISP 1BX: Analysis of Spanish   Fall-08, Fall-09
 LISP 1CX: Analysis of Spanish   Winter-09, Spring-09, Winter-10, Spring-10
 LISP 1DX: Analysis of Spanish   Fall-08, Spring-09, Fall-09, Spring-10

Teaching Assistant

Department of Linguistics, UC San Diego
 LIGN 111: Phonology   Winter-10

Antioch College, Yellow Springs, OH
 Spanish   Fall-02

Language Instructor, Linguistics Language Program, UC San Diego
 LISP 1BX: Analysis of Spanish   Fall-06, Winter-07
 LISP 1CX: Analysis of Spanish   Spring-07, Winter-08
 LISP 1DX: Analysis of Spanish   Fall-07, Spring-08

Bozena Pajak

Academic Service

Reviewing

Journal Papers

Applied Psycholinguistics
Bilingualism: Language and Cognition
Cognitive Development
Cognitive Science
Infant and Child Development
Journal of Experimental Psychology: Language, Memory, and Cognition
Journal of Language Evolution
Journal of Phonetics
Language and Cognitive Processes
Language and Speech
Language Learning
Lingua
Phonology

Conference Papers

Annual Conference of the Cognitive Science Society
Cognitive Modeling and Computational Linguistics Workshop (CMCL)
Transactions on Large-Scale Data and Knowledge-Centered Systems (TLDKS)

Abstracts

Annual Meeting of the Linguistic Society of America
Language and Cognitive Processes Special Issue – Laboratory in the Field:
Advances in Cross-Linguistic Psycholinguistics

Grant Proposals

National Science Center, Poland
National Science Foundation

Conference Organization

2007: Western Conference on Linguistics (WECOL), UC San Diego

Memberships

Linguistic Society of America, 2006–
Cognitive Science Society, 2010–
Association for Psychological Science, 2012–
Association for Computational Linguistics, 2013–
Acoustical Society of America, 2014–2015
American Association for Applied Linguistics, 2016–

Undergraduate Mentorship

Undergraduate Research Assistants, Northwestern University
Alexandra Saldan, Fall 2014 – Winter 2015
Victoria Kuritza, Fall 2014 – Winter 2015

Undergraduate Research Assistants, University of Rochester
Christina Rutherford, Summer 2013 – Fall 2013
Linda Tran, Spring 2013
Donias Doko, Fall 2012 – Spring 2013
Levan Bokeria, Fall 2012
Keyu Song, Fall 2012

Undergraduate Research Assistants, UC San Diego (official supervisors: Eric Baković & Roger Levy)
Hannah Byers-Straus, Fall 2011 – Spring 2012
K. Michael Brooks, Winter 2011 – Spring 2012
Nicole Pyon, Winter 2011 – Spring 2011
Rafi Feliciano, Fall 2010, Fall 2011 – Winter 2012
Annabelle Cadang, Fall 2010
Ryan Short, Spring 2010
Christopher Gaudiot, Fall 2008
Rachel O'Sullivan, Fall 2008

Computer Skills

R, Python, JavaScript, C, C++, Racket, HTML/CSS, Praat, MATLAB, LaTeX

Languages

Polish – native
English – fluent
Spanish – fluent
French – fairly fluent
Italian – conversational
Arabic (Modern Standard & Egyptian) – basic knowledge
German – basic knowledge
Brazilian Portuguese – basic knowledge
Turkish – beginner
Russian – familiarity with the alphabet, basic vocabulary
Somali – field methods research

Last updated: November 4, 2018