Magdalena Kachlicka

The Auditory, Language, Perception, Hearing and Attention Lab
Department of Psychological Sciences, Birkbeck University of London
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Research profile

Researcher in the field of auditory cognitive neuroscience and second language learning, experienced in experimental design, in-person and online language, listening and cognitive performance assessments, neuroimaging methods (EEG, FFR, mTRF) and statistical analyses (mixed-effects models, multidimensional scaling, cluster analysis). Interested in understanding the mechanisms of perception and categorization within the auditory world, as well as exploring individual differences in the perceived quality of sensory experience and the use of emerging technologies in research and education.

Education

2023 Doctor of Philosophy (PhD), Psychology
Birkbeck University of London
Thesis: Perceptual strategies underlying second language acquisition
Supervisors: Prof Adam Tierney, Prof Kazuya Saito, and Prof Fred Dick
Examiners: Dr Emma Holmes (UCL) and Prof Sven Mattys (University of York)

2020 Master of Philosophy (MPhil), Cognitive Science
University College London (UCL)
Thesis: Mapping acoustic and semantic dimensions of auditory perception
Supervisors: Prof Jian Kang and Prof Fred Dick
Examiners: Prof Maria Chait (UCL) and Dr Pyoung-Jik Lee (University of Liverpool)

2018 Master of Science (MSc, Distinction), Psychological Research Methods
Birkbeck University of London
Thesis: Individual differences in auditory processing in second language learning
Supervisor: Dr Adam Tierney

2017 Bachelor of Science (BSc, First Class), Psychology
University of Nicosia
Thesis: Adaptation of the BHI-R Questionnaire from Polish to Greek and English Languages
Supervisor: Dr Marios Adonis

Research Experience

Oct 2023 – Present Postdoctoral Researcher
Department of Psychological Sciences, Birkbeck University of London

Currently, I'm designing an fMRI study to test whether functional connectivity between language and pitch-related regions is enhanced in tonal language speakers. My methodological training involves design optimization and data analysis with AFNI software. I'm also exploring representations of acoustic vs linguistic features in the brain signal measured with EEG, using encoding and decoding models. Additionally, I'm responsible for training of new lab members and lab management.

Oct 2020 – Sep 2023 Doctoral Researcher
Department of Psychological Sciences, Birkbeck University of London

My research investigated the roles of selective attention and dimensional salience in shaping language learners' listening strategies. Results showed that targeted training can boost learning by redistributing the importance of acoustic cues.

- Developed a novel perceptual training paradigm to improve language learners' listening skills
- Designed cognitive tasks and assessment methods (e.g., automated tool for scoring language proficiency)
- Received funding through the Language Learning Dissertation Award for further work ($2000)

Apr 2020 – Sep 2023 Research Assistant

Institute of Education, University College London

This work investigated the role of different facets of auditory processing (acuity, attention, and auditory-motor integration) in second language learning across various populations of learners (experienced and inexperienced, residents of UK, US, China and Japan). I was responsible for experimental design, participant recruitment, data management and processing.

- Collaborated with an international team of researchers and collected data from over 1000 participants worldwide
- Designed openly available experimental tasks (language, musical, auditory tests) and language assessments
- Contributed to multiple publications in high-profile scientific journals

Jul 2022 – Oct 2022 Research Collaborator

University of Social Sciences and Humanities (Poznan, Poland)

A short-term research collaboration that explored the possibility of tracking speech acoustics and contents of narrative reconstructions of past events as indicators of cognitive processing of trauma and posttraumatic growth.

- Established a pipeline for processing interview recordings and transcripts, analysing speech acoustics and conducting sentiment analysis

Oct 2018 – Sep 2020 MPhil Researcher

University College London, Institute for Environmental Design and Engineering

An interdisciplinary and policy-development driven project aimed at developing 'soundscape indices' to adequately reflect the levels of human comfort in perception of complex and context-dependent sound environments.

- Contributed to the development of the soundscape database by conducting noise levels monitoring recordings
- Conducted acoustic and semantic analyses of single sound sources and their perceived similarity
- Secured additional research funding via the Student Project Fund from UCL (£1650)

Oct 2018 – Sep 2020 Research Assistant

Department of Psychological Sciences, Birkbeck University of London

A part-time role that involved participant recruitment, data collection and pre-processing, literature reviews and writing.

- Recruited more than 50 participants and collected neuroimaging data with EEG and FFR
- Learned how to conduct acoustic analyses of speech with Praat software
- Contributed to multiple group publications and published 1 first-author journal article

Jan 2017 – Apr 2017 Research Intern

Experimental Psychology Lab at University of Cyprus (Nicosia, Cyprus)

The project investigated the impact of visual imagery on the experience of pain and compared the effects between two training conditions – altered visual feedback and distraction strategy.

- Learned how to measure maximum voluntary muscle contraction (MVC), heart rate, EMG and skin conductance
- Gained knowledge of altered visual feedback paradigm with VR, pain measurements and performance assessments

Apr 2015 – Dec 2020 Research Collaborator

University of Social Sciences and Humanities (Poznan, Poland)

A longitudinal research project that explored in-depth the meaning of life and personal growth as a result of experienced traumatic events. My work focused on data processing and managing the extensive audio and textual dataset.

- Transcribed over 500 interviews (up to 2 hours long each) and managed anonymised dataset
- Gained working knowledge of McAdams Life Story Interview schedule and qualitative analysis techniques
- Familiarized with literature on the role of personal narratives in personality development and post-traumatic growth

Publications

- **Kachlicka M**, Patel AD, Liu F, & Tierney AT (2024) Weighting of cues to categorization of song versus speech in tone language and non-tone-language speakers. *Cognition*, 246, 105757.
- Saito K, **Kachlicka M**, Suzukida Y, Mora-Plaza I, Ruan Y, Tierney AT (2024) Auditory processing as perceptual, cognitive, and motoric abilities underlying successful second language acquisition: Interaction model. *Journal of Experimental Psychology: Human Perception and Performance*, 50(1), 119–138.
- Saito K, Petrova K, **Kachlicka M**, Suzukida Y, Tierney A (2022) Training auditory processing promotes second language speech acquisition. *Journal of Experimental Psychology: Human Perception and Performance*, 48(12), 1410-1426.
- Saito K, **Kachlicka M**, Suzukida Y, Petrova K, Lee BJ, Tierney AT (2022) Auditory precision hypothesis-L2: Dimension-specific relationships between auditory processing and second language segmental learning. *Cognition*, 229, 105236.
- Saito K, Hanzawa K, Petrova K, **Kachlicka M**, Suzukida Y, Tierney AT (2022) Incidental and multimodal high variability phonetic training: Potential, limits, and future directions. *Language Learning*, 72(4), 1049-1091.
- **Kachlicka M**, Laffere A, Dick F, Tierney A (2022) Slow phase-locked modulations support selective attention to sound. *NeuroImage*, 252, 119024.
- Saito K, Macmillan K, **Kachlicka M**, Kunihara T, Minematsu N (2022) Automated assessment of second language comprehensibility: Review, training, validation, and generalization studies. *Studies in Second Language Acquisition*, 45(1), 234-263.
- Saito K, Macmillan K, Kroeger S, Magne V, Takizawa K, **Kachlicka M**, Tierney AT (2022) Roles of domain-general auditory processing in spoken second language vocabulary attainment in adulthood. *Applied Psycholinguistics*, 43(3), 581-606.
- Saito K, Sun H, **Kachlicka M**, Alayo J, Nakata T, Tierney AT (2022) Domain-general auditory processing explains multiple dimensions of L2 acquisition in adulthood. *Studies in Second Language Acquisition*, 44(1), 57-86.
- Mitchell A, Oberman T, Aletta F, **Kachlicka M**, Lionello M, Erfanian M, Kang J (2021) Investigating urban soundscapes of the COVID-19 lockdown: A predictive soundscape modeling approach. *The Journal of Acoustical Society of America*, 150, 4474–4488.
- Saito K, **Kachlicka M**, Sun H, Tierney A (2020) Domain-general auditory processing as an anchor of post-pubertal second language pronunciation learning: Behavioural and neurophysiological investigations of perceptual acuity, age, experience, development, and attainment. *Journal of Memory and Language,* 115, 104168.
- Mitchell A, Oberman T, Aletta F, Erfanian M, Kachlicka M, Lionello M, Kang J (2020) The Soundscape Indices (SSID) protocol: A method for urban soundscape surveys – questionnaires with acoustical and contextual information. *Applied Sciences*, 10(7), 2397.
- **Kachlicka M**, Saito K, Tierney AT (2019) Successful second language learning is tied to robust domain-general auditory processing and stable neural representation of sound. *Brain & Language*, 192, 15-24.

Preprints

- **Kachlicka M**, Symons AE, Saito K, Dick F, Tierney AT (2024) Tone language experience enhances dimension-selective attention and subcortical encoding but not cortical entrainment to pitch. PsyArXiv.
- **Kachlicka M**, Tierney AT (2024) Voice actors show enhanced neural tracking of pitch, prosody perception, and music perception.
- Correia S, dos Santos Rato AA, Fernandes JD, Ge Y, **Kachlicka M**, Saito K, Rebuschat P (2024) Effects of implicit perceptual training and cognitive aptitude on the perception and production of non-native contrasts. PsyArXiv.
- Symons AE, **Kachlicka M**, Wright E, Razin R, Dick F, Tierney AT (2023) Dimensional salience varies across verbal and nonverbal domains. PsyArXiv.
- **Kachlicka M**, Patel AD, Liu F, & Tierney AT (2023) Weighting of cues to categorization of song versus speech in tone language and non-tone-language speakers. PsyArXiv. ***Published in Cognition*

- **Kachlicka M**, Laffere A, Dick F, Tierney AT (2020) Slow phase-locked endogenous modulations support selective attention to sound. BioRxiv. ***Published in NeuroImage*

Manuscripts in preparation

- **Kachlicka M,** Symons AE, Ruan, Y., Saito K, Dick F, Tierney AT (in preparation). Effects of targeted perceptual training on L2 prosodic cue weighting strategies.
- **Kachlicka M**, van den Bosch J, Kang J, Dick F (in preparation). EnviSounds dataset: A selection of environmental sounds for behavioural and neuroimaging research.
- **Kachlicka M**, van den Bosch J, Kang J, Dick F (in preparation). Representations of natural sound categories.
- Saito K, Argyri F, **Kachlicka M**, Suzukida Y, Tierney AT (in preparation). The bilingual advantage hypothesis revisited: Exploring the auditory processing abilities and executive function of bilingual and monolingual children with diverse biographical backgrounds.

Conference posters

- **Kachlicka M***, Symons AE, Saito K, Dick F, Tierney AT (2023) Effects of first language background and musical experience on cue weighting, attention and dimensional salience in speech and music. *Society for the Neurobiology of Language 15th Annual Meeting (23-26 October 2023, Marseille, France)*
- **Kachlicka M***, van den Bosch J, Kang J, Dick F (2022) Representations of natural sound categories. *FENS Summer School 'Artificial and natural computations for sensory perception' (22-28 May 2022, Bertinoro, Italy)*

Conference papers

- Mitchell A*, Oberman T, Aletta F, Erfanian M, **Kachlicka M**, Lionello M, Kang J (2020) Making cities smarter with new soundscape indices. *The Journal of the Acoustical Society of America*, *146*, 2873.
- Aletta F*, Oberman T, Mitchell A, Erfanian M, Lionello M, **Kachlicka M**, Kang J (2019) Associations between soundscape experience and self-reported wellbeing in open public urban spaces: a field study. *The Lancet*, 394(S17).

Talks

- 'Auditory processing in second language learning' at Brain & Language Seminar (February 2019), University of Helsinki, Finland

Teaching

- **Guest lecturer, Birkbeck Department of Psychological Sciences**

2024 PSYC034H6 Language (UG) – lecture on Speech Production
2023 PSYC007H7 Neuroimaging Methods (PG) – lecture on EEG data processing and analysis

- **Teaching assistant or demonstrator, UCL Psychology and Language Sciences Department**

2023-24 PSYC0046 Introduction to Statistics with R (1UG & 2UG)
2022-23 & **2021-22** PSYC0046 Introduction to Statistics with R (1UG)
2020-21 & **2019-20** PSYC0005 Introduction to Psychological Experimentation (1UG)

- **Teaching assistant, UCL Interaction Centre, Department of Computer Sciences**

2022-23 & **2019-20** COMP0016 Systems Engineering (2UG)
2022-23 & **2019-20** COMP0067 App Design and Engineering (PG)

- **Supervision, UCL Psychology and Language Sciences Department**

Research project coordinator and supervisor for a group of 8-10 students
2021-22 & **2020-21** PSYC0012 Research Methods in Psychology (2UG)

Event Organizing

2020-21 & **2019-20** Methods for Dummies Course (PG); Wellcome Centre for Human Neuroimaging, UCL Institute of Neurology – course organizer and content coordinator

Grants and Awards

2022	Albert Valdman Award for outstanding publication in Studies in Second Language Acquisition
2022	Travel Award, Computational Cognitive Modelling for Language, University of California Irvine
2022	Research Grant ($2000), Language Learning Dissertation Award
2021	Research Grant (£1120), Student Project Fund, University College London
2020–2023	Bloomsbury Graduate Research Studentship, Birkbeck University and UCL IOE
2020	Research Grant (£530), Student Project Fund, University College London
2018–2020	ERC Graduate Research Studentship, ERC Advanced Grant to Prof J Kang No. 740696
2019	JUCE Diversity Scholarship, Audio Developers Conference
2018	Student Travel Award, Real World Communication Workshop, University of Connecticut
2017–2018	Kenway Legacy Scholarship, Birkbeck University
2016–2017	Scholarship Based on Academic Performance, University of Nicosia

Professional Development

2024	BCI & Neurotechnology Spring School, g.tec Medical Engineering GmbH
2024	AFNI Bootcamp on fMRI Data Processing, Quality Control and Visualization, NIH, Bethesda, MD
2023	Seventh Summer School on Statistical Methods for Linguistics and Psychology, Universität Potsdam
2022	Computational Cognitive Modelling for Language Summer School, University of California Irvine
2022	Cognition and Natural Sensory Processing Workshop (CNSP)
2022	Artificial and Natural Computations for Sensory Perception Summer School, FENS
2021	Cognition and Natural Sensory Processing Workshop (CNSP)
2019	Visceral Mind Summer School, Bangor University
2019	SPM for EEG and fMRI Analyses Course, University College London
2019	Real World Eye Tracking Course, Royal Holloway University of London
2019	EEG Training at Jonas & Silas Lab, Middlesex University
2018	TMS for Cognitive Neuroscience Workshop, University College London
2017	Human Brain Anatomy Course, Neurocourses UK

Skills

Research skills: experimental design, data collection, quantitative analysis (mixed-effects models, multidimensional scaling, clustering, similarity), neuroimaging (EEG, FFR, mTRF), speech analysis (acoustics, phonetics, morphing), language, listening and cognitive performance assessments, psychophysics, project and data management

Analytical skills: attention to detail, problem solving, critical thinking, scientific writing, adaptability to new technologies

Technical skills: R (statistical analysis, data wrangling and visualization) – advanced; HTML and CSS, GitHub, JavaScript, Python (NLTK, Parselmouth), MATLAB (STRAIGHT, FieldTrip, mTRF), SoX – moderate; AFNI, EEGLab & ERPLab – basics.

Software: Adobe Audition, Audacity, Praat