

## Dr Emmanuel Biau

e.biau@bham.ac.uk

School of Psychology, University of Birmingham, B15 2TT Birmingham, UK.

### ACADEMIC POSITIONS

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- 2018 -** Sir Henry Wellcome Postdoctoral fellow at the Cognition and Oscillations Lab, University of Birmingham (UK). Mentored by Prof Simon Hanslmayr and Prof Ole Jensen.
- 2016 - 2018** Marie Skłodowska-Curie Postdoctoral fellow at the Basic and Applied NeuroDynamics Lab, University of Maastricht (Netherlands). Mentored by Prof Sonja Kotz.
- 2011 - 2015** National PhD (FPI) fellow at the Multisensory Research Group, Pompeu Fabra University (Barcelona, Spain). Supervised by Prof Salvador Soto-Faraco.
- 2010 - 2011** Research assistant at the Multisensory Research Group, Pompeu Fabra University (Barcelona, Spain). Supervised by Prof Salvador Soto-Faraco.

### EDUCATION

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- 2015** PhD in Biomedicine (*excellent cum laude*), Pompeu Fabra University, Barcelona (Spain). Dissertation: "Beat gestures and speech processing: When prosody extends to the speaker's hands" (supervisor: Prof Salvador Soto-Faraco). The dissertation was awarded the European Mention in the Doctoral Diploma.
- 2009** MSc in Cognitive Neuroscience and Behavioural, Pierre and Marie Curie University (Paris, France).
- 2007** BSc in Integrative Biology and Physiology, Paul Sabatier University (Toulouse, France).

### FELLOWSHIPS AND GRANTS

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- 2018 - 2022** Sir Henry Wellcome Postdoctoral Fellowship (PI). Total: 250.000,00 £. Funding body: The Wellcome Trust. Institutions: The University of Birmingham (UK), Newcastle University (UK) and University of Geneva (Switzerland).
- 2016 - 2018** Marie Skłodowska-Curie Individual Fellowship (PI). Total: 165.599,00 €. Funding body: European Union's Horizon 2020. Research and Innovation programme. Institution: Maastricht University (Netherlands).
- 2011 - 2015** FPI Pre-doctoral Fellowship (PI). Total: 65.688,00 €. Funding body: Spanish Ministry of Education. Institution: Pompeu Fabra University (Barcelona, Spain).

**2013 - 2014** National Sub-Program for Mobility Grant (PI). Total: 6.000,00 €. Funding body: Spanish Ministry of Education. Institutions: Pompeu Fabra University (Barcelona, Spain) and Hull University (UK).

## **PUBLICATIONS (195 citations; h-index: 7; \*highest cited papers)**

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### **Articles published in peer-reviewed journals**

1. **Biau, E.**, Wang, D., Park, H., Jensen, O., & Hanslmayr, S. (2021). Auditory detection is modulated by theta phase of silent lip movements. *Current Research in Neurobiology*, 100014.
2. Schultz, B. G., **Biau, E.**, & Kotz, S. A. (2020). An open-source toolbox for measuring dynamic video framerates and synchronizing video stimuli with neural and behavioral responses. *Journal of Neuroscience Methods*, 343.
3. Schwartze, M., Brown, R.M., **Biau, E.**, and Kotz, S.A. (2019), Timing the “magical number seven”: Presentation rate and regularity affect verbal working memory performance. *International Journal of Psychology*.
4. **Biau, E.**, & Kotz, S. (2018). Lower beta: a central coordinator of temporal prediction in multimodal speech. *Frontiers in Human Neuroscience*, 12:434.
5. **Biau, E.**, Fromont, L.A., & Soto-Faraco, S. (2017). Beat gestures and syntactic parsing: An ERP study. *Learning and Language*, 68, 102–126.
6. Fromont, L.A., Soto-Faraco, S., & **Biau, E.** (2017). Searching high and low: Prosodic breaks disambiguate Relative clauses. *Frontiers in Psychology*, 8:96.
7. **Biau, E.**, Fernandez, L.M., Holle, H., Avila, C., & Soto-Faraco, S. (2016). Hand gestures as visual prosody: BOLD responses to audio-visual alignment are modulated by the communicative nature of the stimuli. *NeuroImage*, 132, 129-137.\*
8. **Biau, E.**, & Soto-Faraco, S. (2015). Synchronization by the hand: The sight of gestures modulates low-frequency activity in brain responses to continuous speech. *Frontiers in Human Neuroscience*, 9, 527.
9. **Biau, E.**, Torralba, M., Fuentemilla, L., de Diego Balaguer, R., & Soto-Faraco, S. (2015). Speaker’s hand gestures modulate speech perception through phase resetting of ongoing neural oscillations. *Cortex*, 68, 76-85.\*
10. **Biau, E.**, & Soto-Faraco, S. (2013). Beat gestures modulate auditory integration in speech perception. *Brain and Language*, 124(2), 143–52.\*

### **Chapters published in peer-reviewed journals**

1. Soto-Faraco, S., Kvasova, D., **Biau, E.**, Ikumi, N., Ruzzoli, M., Morís-Fernández, L., & Torralba, M. (2019). Multisensory Interactions in the Real World (Elements in Perception). *Cambridge: Cambridge University Press*.

## SUBMITTED PUBLICATIONS

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**Biau, E.,** Wang, D., Park, H., Jensen, O., & Hanslmayr, S. (*submitted*). Auditory entrainment by silent lip movements. <https://www.biorxiv.org/content/10.1101/2020.07.07.186452v3>

**Biau, E.,** Schultz, B.G., Gunter, T.C., & Kotz, S.A. (*submitted*). Delta oscillations support multimodal speech integration (*PDF of the manuscript available upon request*).

## PUBLICATIONS IN PREPARATION

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Branzi, F.M., **Biau, E.,** Schultz, B.G., Martin, C.D., & Costa, A. (*in preparation*). Bilingual lexical access is triggered by the intention to speak: behavioural and ERP/EEG evidence.

## INVITED SPEAKER

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- 2020** “Visual perception of lip movements entrains auditory brain oscillations and drives auditory perception”. Talk at the Biomag conference, Birmingham (UK).
- 2017** “Beat gestures in audiovisual speech: Prosody extends to the speaker’s hands”. Invited by Dr Ozyurek at the Max Plank Institute of Nijmegen (Netherlands).
- “Temporal predictions and audiovisual speech”. Department of Psychology, Maastricht University (Netherlands).
- 2016** “Beat gestures and speech processing: When prosody extends to the speaker’s hands”. Talk at the SNL satellite: sensorimotor speech symposium at the UCL (London, UK).
- 2013** “Spontaneous gestures modulate speech processing through phase resetting of delta-theta neural oscillations”. Talk at the International Multisensory Research Forum (Jerusalem, Israel).
- “Spontaneous gestures modulate auditory integration in natural speech perception”. Invited by Dr Holle at the Hull University (UK).
- 2012** “Beat gestures modulate auditory integration in speech perception”. Talk at the IV BrainGlot Workshop, Vitoria (Spain).
- 2011** “Does the addition of visual speech enable non-native phonetic contrasts by acting on the acoustic neural representation of speech sounds?” Invited by Dr Escera at the University of Barcelona (Spain).
- 2009** “Effect of visual stimulus pre-exposition on procedural learning, and interactions with sleep”. Neural correlates of spatial memory lab. Invited by Dr Jansen at the Donders Institute of

Nijmegen (Netherlands).

## TEACHING, SUPERVISION AND MENTORING

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### TEACHING

- 2017** Problem Based Learning in “*Brain Damage*” (20 hours), Master in Psychology and Neuroscience, Maastricht University (Netherlands).
- 2016** Problem Based Learning in “*Ageing*” (20 hours), Master in Psychology and Neuroscience, Maastricht University (Netherlands).

### SUPERVISION AND MENTORING

- 2020** Supervision of a final year MSc project (Yue Hu), entitled: “*The role of theta oscillations in binding multimodal speech in episodic memory*”. University of Birmingham (UK).
- 2019** Supervision of an intern period project (Fatima Mahroof), entitled: “*Auditory detection performance are modulated by visual entrainment to lips*”. University of Birmingham (UK).
- 2018** Supervision of an intern period project (Maria Alba Diaz), entitled: “*Neural entrainment in audiovisual speech processing*”. Maastricht University (Netherlands).
- Co-supervision of a group of six undergraduate students for their BSc research project, entitled: “*Timing the “magical number seven: Presentation rate and regularity affect verbal working memory performance*”. Maastricht University (Netherlands).
- 2017** Co-supervision of a final year BSc project (Elles Houkes), entitled: “*Neural entrainment in audiovisual, visual and auditory beat sequences*”. Maastricht University (Netherlands).
- Supervision of an intern period project (Nina Engels), entitled: “*Neural temporal predictions during continuous audiovisual speech encoding*”. Maastricht University (Netherlands).
- 2014** Co-supervision of a final year MSc project (Sandra Concha Lopez), entitled: “*Beat gestures on sentence disambiguation: a perception study*”. Pompeu Fabra University, Barcelona (Spain).
- 2013** Co-supervision of a final year MSc project (Lauren Fromont, c.f. publications 4&5), entitled: “*Taking prosody by the hand: on the effect of pauses and beat gestures on sentence disambiguation*”. Pompeu Fabra University, Barcelona (Spain).

## PROFESSIONAL SERVICES

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### AD HOC REVIEWER

*Current Biology*; *Proceedings of the National Academy of Sciences (PNAS)*; *Human Brain Mapping*; *Brain and*

*Language; Frontiers; Neuropsychologia; Gesture; Journal of Neurolinguistics; Language, Cognition & Neuroscience; Language learning.*

## ORGANISATION OF CONFERENCES OR OUTREACH/MEDIA EVENTS

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- 2020** Single Units and Human intracranial EEG meeting, Birmingham (UK).
- 2016** <https://www.upf.edu/ca/web/e-noticies>: “Àrees cerebrals específiques capten la sincronia entre l’entonació i el gest d’un ponent mentre fa un discurs”.
- 2015** Organization of the 1st CBC Workshop 2015, Barcelona (Spain).
- 2010** Conference organisation assistant at the Human Brain Mapping Conference, Barcelona (Spain).

## ONGOING COLLABORATORS

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**Prof Christopher Petkov** (Newcastle University, UK) collaborates on the analysis of intracranial EEG data recorded with patients in Birmingham. He is part of my current Sir Henry Wellcome fellowship as a sponsor.

**Prof Anne-Lise Giraud** (University of Geneva, Switzerland) collaborates on a project integrating theta oscillations and a syllable-based speech models together to develop a computational model on multimodal speech episodic memory.

**Prof Sonja Kotz** (Maastricht University). The current collaboration includes three ongoing projects investigating the oscillatory correlates of temporal integration during multimodal perception (both audiovisual speech and artificial stimuli).

**Dr Hyojin Park (University of Birmingham)** collaborates on various projects investigating the oscillatory correlates of multimodal speech episodic memory, as well as the communication between visual and auditory cortices during lip movement perception.

**Prof Pilar Prieto** and **Prof Salvador Soto-Faraco** (Pompeu Fabra University, Barcelona, Spain) are collaborating on a project investigating the neural signatures (EEG) of beat gesture integration with auditory speech, and how they modulate prosody perception in native/non-native speakers.

## SELECTED CONFERENCE PRESENTATIONS

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- 2019** **Biau, E., Wang, D., Park, H., Jensen, O., & Hanslmayr, S.** *Hang on the lips: The listeners’ brain entrains to the audiovisual theta rhythms during naturalistic multimodal speech perception.* Society for the Neurobiology of Language (SNL) Annual Meeting, Helsinki (Finland). Poster Presentation.

- 2017**      Branzi F.M., **Biau E.**, Schultz B.G., Martin C.D, & Costa A. *Bilingual lexical access is triggered by the intention to speak: behavioral and ERP/EEG evidence*. Cognitive Neuroscience Society (CNS) Annual Meeting, San Francisco (USA). Poster Presentation.
- 2015**      **Biau, E.**, Fernandez, L.M., Holle, H., Avila, C., & Soto-Faraco, S. *Hand gestures as visual prosody: BOLD responses to audio-visual alignment are modulated by the communicative nature of the stimuli*. International Multisensory Research Forum, Pisa (Italy). Poster presentation.
- 2014**      **Biau E.**, Fromont L., and Soto- Faraco S. *The effect of pauses and beat gestures on syntactic parsing*. International Multisensory Research Forum, Amsterdam (Netherlands). Poster presentation.
- 2012**      **Biau E.**, and Soto- Faraco S. *Do beat gestures modulate auditory integration in speech perception?* International Multisensory Research Forum, Oxford (UK). Poster presentation.

## SPECIALIZED SCIENTIFIC TRAINING

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- 2019**      Analysing Neural Time Series Analysis course (ANTS), Radboud University, Nijmegen (Netherlands).
- 2016**      Problem-Based Learning training, Maastricht University (Netherlands).
- 2014**      SPM training course (beginners), UCL, London (UK).
- 2010**      EEG/MEG: Practical Tools for Advanced Analysis course at the Brain Mapping, Barcelona (Spain).

## COMPUTING KNOWLEDGE

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Programming and data analysis skills: Matlab; Python.

Electrophysiological data recording: Biosemi, BrainVision, Brainstorm, Polhemus (EGG signal); Neuralynx (intracranial EEG signal);

Toolboxes for M/EEG and iEEG data analysis: Matlab ; Fieldtrip; MRICro gl/Caret, Wav\_Clus.

## LANGUAGES

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French: native.

English: Highly proficient in reading, writing and speaking.

Italian: Highly proficient in reading, writing and speaking.

Spanish: Highly proficient in reading, writing and speaking.

## **SOCIETY MEMBERSHIPS**

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Society for the Neurobiology of Language, SNL (2016-present).

Society For Neuroscience, SfN (2020-present).

## **REFEREES**

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**Prof Simon Hanslmayr** (School of Psychology, University of Glasgow, UK).

**Prof Ole Jensen** (School of Psychology, University of Birmingham, UK).

**Prof Sonja Kotz** (Faculty of Psychology and Neuroscience, Maastricht University, Netherlands).

**Prof Salvador Soto-Faraco** (Centre of Brain and Cognition, Pompeu Fabra University, Barcelona, Spain).