

Ana Zappa

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I am a linguist specializing in second language (L2) learning, embodiment and social interaction. I study how physical and social interaction shape the cognitive and neurocognitive mechanisms of word learning using innovative methodologies that combine immersive environments (VR), behavioural measures, pupillometry, eye-tracking and electroencephalography.

education

2014-2016	Master's degree in Language Sciences (focus on experimental linguistics) • Aix-Marseille Université • Aix-en-Provence • supervisor: Cheryl Frenck-Mestre
2016-2020	PhD in Language Sciences (10/12/2020) • Aix-Marseille Université • Laboratoire Parole et Langage (LPL) • Aix-en-Provence • <i>Embodied language put to the test: electrophysiological evidence from virtual reality and classical environments</i> supervisor: Cheryl Frenck-Mestre

current position

2025-present	Post-doctoral researcher • Dept. of Cognition, Development and Educational Psychology and the Event Lab, Institute of Neurosciences • University of Barcelona • Spain • supervisors: Antoni Rodriguez-Fornells & Mel Slater Focus on developing a neural measure of “presence” using EEG. I developed a collaborative game in VR where participants interact socially (PRESENCE, a European multi-partner project)
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previous positions

2022-2025	Marie Skłodowska-Curie European Fellowship • Brain correlates of socially interactive language learning (BraSILL) • University of Barcelona, Spain • supervisors: Antoni Rodriguez-Fornells and Mel Slater
2021-2022	Post-doctoral researcher, Institute of Language, Communication and the Brain (ILCB) • Aix-Marseille University • (supervisors: Daniel Mestre and Cheryl Frenck-Mestre) - Focus on examining the neural correlates of embodied L2 learning

research achievements

Ground-breaking research

- Identified the neural and physiological correlates of learning words with social feedback
- Provided neural evidence that enacting and observing actions during verb learning enhances word-to-action mapping in the brain
- Demonstrated that, like children, adults use eye gaze to support novel word learning in immersive environments

Independence, creativity, and interdisciplinary leadership

- Independently designed innovative, ecologically valid experiments combining immersive VR, EEG, eye-tracking, and pupillometry
- Founded and led three cross-disciplinary, international teams of cognitive neuroscientists, engineers, and VR researchers (once at Aix-Marseille University and twice at University of Barcelona)
- Developed novel methods to capture embodied and social processes in foreign language learning (Cave Automatic Virtual Environment and EEG; Head-mounted display and eye-tracking; Head-mounted display and EEG; EEG and pupillometry)

Breakthroughs across disciplines

- Pioneered the integration of EEG and immersive VR to study real-time language processing
- Authored an interdisciplinary review outlining how VR can bridge gaps between theoretical models and empirical methods in socially interactive L2 learning

publications

- Zappa, A.**, Slater, M., & Rodriguez-Fornells, A. (2025). Social interaction shapes and boosts second language learning: Virtual reality can show us how. *Npj Science of Learning*, 10(1), 90. <https://doi.org/10.1038/s41539-025-00381-8>
- Zappa, A.**, Osokina, P., Cerdà-Company, X., Cucurell, D., Mateu, M., & Rodriguez-Fornells, A. (2025). The Effects of Reliable Social Feedback on Language Learning: Insights from Electroencephalogram and Pupillometry. *Journal of Cognitive Neuroscience*, 1–33. <https://doi.org/10.1162/JOCN.a.2420>
- Grassi, M., Talamini, F., Altoè, G., Brattico, E., Caclin, A., ... **Zappa, A.** (2025). Do Musicians Have Better Short-Term Memory Than Nonmusicians? A Multilab Study. *Advances in Methods and Practices in Psychological Science*, 8(4), 25152459251379432. <https://doi.org/10.1177/25152459251379432>
- Zappa, A.**, León-Cabrera, P., Ramos-Escobar, N., Laine, M., Rodriguez-Fornells, A., & François, C. (2025). Alpha and beta desynchronization during consolidation of newly learned words. *NeuroImage*, 318, 121410. <https://doi.org/10.1016/j.neuroimage.2025.121410>
- Zappa, A.**, Bolger, D., Pergandi, J.-M., Fargier, R., Mestre, D., & Frenck-Mestre, C. (2024). The Neural Correlates of Embodied L2 Learning: Does Embodied L2 Verb Learning Affect Representation and Retention? *Neurobiology of Language* (Cambridge, Mass.), 5(2), 360–384. https://doi.org/10.1162/nol_a_00132
- *Bechtold, L., Cosper, S. H., Malyshevskaya, A., Montefinese, M., Morucci, P., Niccolai, V., Repetto, C., **Zappa, A.**, & Shtyrov, Y. (2023). Brain Signatures of Embodied Semantics and Language: A Consensus Paper. *Journal of Cognition*, 6(1). (*all authors are first authors) <https://doi.org/10.5334/joc.237>
- Zappa, A.**, & Frenck-Mestre, C. (2023). Embodied L2 processing and learning from a neurocognitive perspective. In *The Routledge Handbook of Second Language Acquisition and Neurolinguistics*. <https://doi.org/10.4324/9781003190912-35>
- Frenck-Mestre, C., Choo, H., **Zappa, A.**, Herschensohn, J., Kim, S.-K., Ghio, A., & Koh, S. (2022). The Online Processing of Korean Case by Native Korean Speakers and Second Language Learners as Revealed by Eye Movements. *Brain Sciences*, 12(9), 1230. <https://doi.org/10.3390/brainsci12091230>
- Eschenauer, S., Tellier, M., & **Zappa, A.** (2022). Encorporer les langues vivantes: Reconnaître la place du corps pour enseigner et pour apprendre. *TIPA. Travaux interdisciplinaires sur la parole et le langage*, 38. <https://doi.org/10.4000/tipa.4790>
- Zappa, A.**, Mestre, D., Pergandi, J.-M., Bolger, D., & Frenck-Mestre, C. (2022). Cross-linguistic gender congruency effects during lexical access in novice L2 learners: Evidence from ERPs. *Language, Cognition and Neuroscience*, 37, 1073–1098. <https://doi.org/10.1080/23273798.2022.2039726>
- Zappa, A.**, Bolger, D., Pergandi, J.-M., Mallet, P., Dubarry, A.-S., Mestre, D., & Frenck-Mestre, C. (2019). Motor resonance during linguistic processing as shown by EEG in a naturalistic VR environment. *Brain and Cognition*, 134, 44–57. <https://doi.org/10.1016/j.bandc.2019.05.003>

preprints

- Zappa, A.**, Osokina, P., Fargier, R., Cerdà-Company, X., Panisello, S., Anderssen, N., Zambrana, I., Rodriguez-Fornells, A., & Slater, M. (2025). *Gaze guides language comprehension in adults in a simulated social environment*. https://doi.org/10.31234/osf.io/y5wtg_v1

Román-Caballero, R., Başkent, D., Caclin, A., Ferreri, L., Fiveash, A., François, C., Grassi, M., Harding, E., Lima, C., & Overy, K. ... **Zappa, A.** (2025). *Common Evidence, Multiple Interpretations: Commentaries on a Multilab Study on Musicians' Short-Term Memory*. https://osf.io/2z7jc_v1

fellowships & awards

- 2022 **Marie Skłodowska-Curie European Fellowship** • European Commission
- 2022 **Juan de la Cierva Fellowship** • Spanish government • University of Barcelona • (declined to accept Marie Curie Fellowship)
- 2021 **Best Thesis Prize** • Aix-Marseille University • Marseille
- 2021 **Qualification** to the function of Assistant/Associate Professor (mandatory pre-requisite for teaching & research faculty positions in France) • Language Sciences
- 2020 **Institute of Language, Communication and the Brain (ILCB)**, Financing for experiments • Aix-Marseille University

selected invited & conference presentations

- 2025 **Neurocenter** • Geneva University, Geneva • *The role of action and social cues in language learning* • invited talk

 International conference on cognitive neuroscience (ICON) • Porto • Symposium on social interaction and embodiment in language learning • *How social cues shape second language learning: Evidence from pupillometry, EEG and eye-tracking* • invited symposium talk

 Embodied and Situated Language Processing Conference • Aix-en-Provence • Zappa, A., Panisello, S., Slater, M., Anderssen, N., Zambrana, I., Fargier, R., Rodriguez-Fornells, A. • *Gaze following supports language comprehension and learning in adults: evidence from VR and eye-tracking* • poster presentation
- 2024 **Multimodality workshop** • Aix-Marseille University, ILCB • Marseille • *Following reliable social gaze supports language learning in adults: evidence from virtual reality* • invited talk

 Conference on multilingualism • Aix-en-Provence • Zappa, A., Osokina, P., Cerdà-Company, X. Slater, Cucurell, D., Mateo, M., Rodriguez-Fornells, A. • *Learning L2 words with social feedback: evidence from pupillometry and EEG* • oral presentation

 European workshop on imagery and cognition • Naples • *Using VR to explore the role of social cues and interaction in Second Language learning* • invited symposium talk

 Base Corpus Langage • Université Côte d'Azur, Nice • *Exploring the role of action and social cues in L2 learning using interactive VR and EEG* • invited talk
- 2023 **Neurovirtual Group** • Faculty of Medicine • University of Barcelona • Barcelona • *VR to investigate language processing and learning* • invited talk

 Embodied and Situated Language Processing Conference • Messina • Zappa, A., Panisello, S., Slater, M., Anderssen, N., Zambrana, I., Fargier, R., Rodriguez-Fornells, A. • *Can social gaze in a virtual environment contribute to language learning?* • oral presentation
- 2021 **Embodied and Situated Language Processing Conference** • Virtual • Zappa, A., Bolger, D., Pergandi, J., Fargier, R., Mestre, D., Frenck-Mestre, C. • *Does embodied L2 verb learning affect retention and representation?* • oral presentation
- 2020 **Embodied interactions, Languaging and the Dynamic Medium Workshop** • ENS, Lyon • Zappa, A., Bolger, D., Pergandi, J., Fargier, R., Mestre, D., Frenck-Mestre, C. • *Does embodied L2 verb learning affect retention and representation?* • poster presentation

 Live MEEG • Virtual • Zappa, A., Bolger, D., Pergandi, J., Fargier, R., Mestre, D., Frenck-Mestre, C. • *The neural correlates of embodied L2 learning* • poster presentation

2019	Society for the Neurobiology of Language • Helsinki • Zappa, A., Bolger, D., Pergandi, J., Mestre, D., Frenck-Mestre, C. • <i>Grammatical gender inhibition in learning of a second language vocabulary: ERP evidence</i> • poster presentation
	Society for the Neurobiology of Language • Helsinki • Zappa, A., Bolger, D., Frenck-Mestre, C. • <i>The role of motor activation during action verb processing: An EEG study</i> • poster presentation
2018	Society for the Neurobiology of Language • Quebec City • Zappa, A., Bolger, D., Pergandi, J., Mallet, P., Dubarry, A.S., Mestre, D., Frenck-Mestre, C. • <i>Planning to manipulate virtual objects elicits activation of motor-related brain activity: evidence from ERPs in a CAVE</i> • poster presentation
	International meeting of the Psychonomic Society • Amsterdam • Zappa, A., Bolger, D., Pergandi, J., Mallet, P., Dubarry, A.S., Mestre, D., Frenck-Mestre, C., <i>Is motor activation necessary for action language processing? Evidence from EEG</i> • poster presentation
	Laboratoire de parole et langage, Centre Gilles Gaston Granger, ED 356 • Aix-en-Provence • Embodiment Workshop • <i>Embodiment and language: what do we know?</i> • invited talk
	Laboratoire de parole et langage • Aix-en-Provence • Journée de rencontre avec les enseignants de primaire et secondaire • <i>Embodied cognition and second language acquisition</i> • invited talk
2017	Cognitive Neuroscience Society • San Francisco • Zappa, A., Pergandi, J., O’Neil, K., Mestre, D., Newman, A., Frenck-Mestre C., <i>Adult Second Language Learning and Semantic Integration as revealed by Eye-tracking and EEG</i> • poster presentation
	International Symposium of bilingualism • Limerick • Zappa, A., Ghio, A., Mestre, D., Frenck-Mestre, C. • <i>Rapid Integration of Sentence Meaning in an L2 as revealed by ERPs: Electrophysiological evidence of rapid L2 learning through computerized games</i> • poster presentation
	Society for the Neurobiology of Language • London • Zappa, A., Pergandi, Mestre, D., Frenck-Mestre, C. • Society for the Neurobiology of Language • <i>How Serious are Games? Electrophysiological evidence of rapid L2 learning</i> • poster presentation
	Laboratoire de parole et langage • Aix-en-Provence • Rencontre avec les enseignants de primaire et secondaire • <i>Embodied cognition and second language acquisition</i> • invited talk

teaching

2024 & 2025	University of Barcelona • Barcelona • <i>Invited lecture on Embodiment and Social interaction in language processing and learning</i> • Cognitive Psychology Master’s
2021-2022	Aix-Marseille University • Aix-en-Provence • <i>Scientific English</i> • Psychology Master’s
2020	MASCO (Master in Cognitive Science • Aix-en-Provence & Marseille • <i>Embodied cognition and language processing</i> • Language and cognition Master’s INSPE • Aix-en-Provence • <i>Embodied effects in Language processing</i> • Education Master’s

peer reviewing

2021-2025	Reviewer for Wiley Language Learning, Cortex, Neurobiology of language, PloS One, Psychonomic Bulletin & Review, Journal of Cognitive Psychology, Psychophysiology, Bilingualism: Language and Cognition, Journal of Experimental Psychology, Psychological Research, Scientific Reports etc.
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supervision: students & early career researchers

2022-present	Polina Osokina, CCI ^L , Master's and PhD (co-supervisor) Lucía González, PhD (2nd supervisor) Weijing Xing, PhD • University of Barcelona (2nd supervisor) María Mateo, Master's • Universitat Autònoma de Barcelona (2nd supervisor) Sergi Curto Panisello , Master's • Universitat Politècnica de Catalunya (1st supervisor)
2020-2021	Fatima Kassim, Master's • Aix-Marseille University (2nd supervisor)
2019-2020	Daria Goryachun, Master's • Aix-Marseille University (2nd supervisor)

conference organisation & evaluation

2025	Embodied and Situated Language Processing Conference • Aix-en-Provence • France • Organisation and Scientific committee
2024	International Multi-Brain Barcelona Congress • University of Barcelona • Barcelona • Scientific committee
	Embodied and Situated Language Processing Conference • Berlin • Scientific committee
2023	Doctoral Day Oral and Poster presentations • Institute of Neurosciences • University of Barcelona • Barcelona • Scientific committee
2021	CuttingEEG conference • ILCB, Aix-Marseille Université, Institut des Neurosciences des Systèmes, Cenir, Institut du cerveau • Aix-en-Provence • Organisation and logistics

scientific training

2024	Bayesian statistics: theory and practice • 3-day course by Mark Andrews • Faculty of Psychology • Lisbon University • Lisbon
2024	Leadership Program for Junior Women in Science • 5-day course by Alicia Marín Muniesa • “Sky is the limit” • Hospital Clínica, University of Barcelona • Barcelona
2022	Mixed models • 3-day course by Gabriel Weising • Aix-Marseille Université • Marseille

languages

Native: Brazilian Portuguese, English

Proficient: French

Intermediate: Spanish, Catalan

Basic: Italian, Russian

other professional experience & training

Before beginning my academic career, I worked for several years in **international film and documentary production**, where I developed strong skills in project coordination and cross-cultural collaboration, skills that now support my leadership of interdisciplinary research teams and complex experimental projects.

In parallel with my scientific work, I also provided **medical and psychosocial interpretation services for refugees and migrants** with the NGO *OSIRIS* (in Marseille) and other organisations. This experience offered first-hand insight into how language mediates communication and social connection in vulnerable contexts.

Together, these experiences have colored my scientific perspective and made me particularly well equipped to lead my CR CNRS project grounded in the study of second language learning in adults as shaped by social interaction.