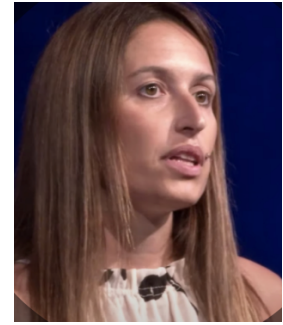


Laura Zapparoli – Curriculum Vitae

PLACE AND DATE OF BIRTH. Bergamo, Italy, August 19th, 1986.

Google scholar: <https://scholar.google.com/citations?user=VkEOzQIAAAAJ&hl=it>

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=55500159900>



CURRENT POSITIONS

February 2022 - present: Senior Assistant Professor, Psychology Department, University of Milano-Bicocca.

June 2019 - present: Co-director of the Neuropsychology Lab & Scientific Consultant for the fMRI Unit, IRCCS Galeazzi (Milan, Italy).

PREVIOUS POSITIONS

2019-2022: Post-Doctoral Researcher, Psychology Department, University of Milano-Bicocca.

2016-2019: Post-Doctoral Researcher. fMRI Unit; IRCCS Galeazzi (Milan, Italy).

2014-2015: Visiting PhD Student at Sobell Department of Motor Neuroscience and Movement Disorders; Institute of Neurology; University College London. Supervisor: Prof. James Kilner. (London, UK).

2014-2015: Research fellow; IRCCS Galeazzi (Milan, Italy).

2012-2015: PhD Student in Cognitive Neuroscience, University of Milano-Bicocca (Milan, Italy).

EDUCATION

2020: Abilitazione Scientifica Nazionale (Professore II° Fascia) for the Scientific Sector 05/D1 (SSD: BIO/09).

2018: Abilitazione Scientifica Nazionale (Professore II° Fascia) for the Scientific Sector 11/E1 (SSD: MPSI/01-02-03).

2018: Master's degree in Biostatistics (summa cum laude), University of Milano-Bicocca.

2016: PhD in Cognitive Neuroscience (evaluation: excellent), University of Milano-Bicocca.

2012: Professional Qualification as Psychologist (Albo della Lombardia, 03/15197).

2010: Master's degree in Neuropsychology (summa cum laude), University of Milano-Bicocca.

2008: Bachelor's Degree in Psychology (summa cum laude), University of Milano-Bicocca.

MAIN SCIENTIFIC ACHIEVEMENTS

My main research interest is the **neuroscience of motor cognition**, with reference to the study the different stages of the action production: from the more abstract aspects (i.e., the different components of intention to move and the mechanism of action representation), through explicit motor execution and motor awareness.

These topics were investigated during my PhD in healthy subjects, with particular attention to the **changes associated with the adult life-span** and the physiological processes of aging (Zapparoli et al., 2013, 2014, 2016b, 2019a, 2020b, 2022a), but also in neurological populations (Zapparoli et al., 2015, 2016a, 2017, 2019b, 2020d) and in orthopedic patients (Zapparoli et al., 2020a).

During my post-doc, I moved to the study of more abstract aspects of motor cognition, such as the **different mental processes related to intentional actions (motor intentionality and the sense of agency)** for both abstract actions (Zapparoli et al., 2018, 2022b) and daily life behaviours (Zapparoli et al., 2020c), also in the domain of joint actions (Zapparoli et al., 2022b). These topics have been investigated by means of **behavioural, fMRI, EEG, TMS and tDCS techniques**.

MAIN SCIENTIFIC COLLABORATIONS

Prof. James Kilner (University College London). Cognitive Neuroscience of motor control in healthy subjects and neurological populations with EEG techniques. See Palmer, Zapparoli, Kilner (2016) and Zapparoli et al. (2019b).

Prof. Peter Brugger (Universitätsspital Zürich). Neurodysfunctional correlates of Body Integrity Dysphoria. See Saetta et al. (2020).

Prof. Peter H. Weiss-Blankenhorn, (Institut für Neurowissenschaften und Medizin, Forschungszentrum Juelich, DE). Predicting and preventing the risk of falls in elderly people: a neurocognitive approach.

Prof. Livio Luzzi & Dr Anna Ferrulli (University of Milan). Neurofunctional markers of food-oriented behaviour in obesity and healthy subjects with fMRI and TMS methods. See Devoto, Zapparoli et al. (2018) and Devoto et al. (2021).

Prof. Mauro Porta (IRCCS Galeazzi, Milan). Neurodysfunctional correlates of motor control in Gilles de la Tourette. See Zapparoli et al. (2015, 2016, 2017, 2020d).

Prof. Marco Tettamanti (CIMEC, Trento). Cognitive Neuroscience of motor control using advanced statistical analyses (Dynamic Causal Modelling and MVPA). See Zapparoli et al. (2017, 2020c).

Prof. Nadia Bolognini (University of Milano-Bicocca). Cognitive Neuroscience of motor control using TMS. See Zapparoli et al. (2020c).

Prof. Gabriella Bottini & Prof. Martina Gandola (University of Pavia). Cognitive Neuroscience of body and motor awareness. See Invernizzi et al. (2013) and Gandola et al. (2014).

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Prof. Manuela Berlingerì (University of Urbino). Neurocognitive models of aging with tDCS methods. See Vergallito et al. (2018).

PRIZES AND GRANTS

Prizes.

2019: Young Talents (2nd prize) - Accademia Nazionale dei Lincei.

2019: Young Talents (1st prize) - Accademia Nazionale dei Lincei.

2018: Junior Prize - Italian Society of Psychophysiology and Cognitive Neuroscience.

2018: Best contribution - European Workshop on Cognitive Neuropsychology.

2015: Best contribution - Federation of the European Societies of Neuropsychology.

Grants.

2019: “Intentional actions towards food stimuli: behavioural and fMRI studies in healthy populations and in obesity”. Funding agency: Italian Ministry of Education. Amount (€): 80000.

2015: “Neurofunctional correlates of intentional motor processes”. Funding agency: Cariplo Foundation. Amount (€): 3000.

TEACHING ACTIVITY

2022-2023: Adjunct Professor of Neuropsychology. Bachelor's Degree in Psychological Sciences and Techniques. University of Milano-Bicocca (4+4+4+2 CFU).

2021-2022: Adjunct Professor of Neuropsychology. Bachelor's Degree in Psychological Sciences and Techniques. University of Milano-Bicocca (4+4 CFU).

2020-2021: Adjunct Professor of Psychobiology. Bachelor's Degree in Psychological Sciences and Techniques of Cognitive Processes. University of Sassari (4 CFU).

2020-2021: Adjunct Professor of Methods in Cognitive Neuroscience. Master's Degree in Neuropsychology. University of Milano-Bicocca (4 CFU).

2020-2021: Adjunct Professor of Psychobiology. Bachelor's Degree in Psychological Sciences and Techniques of Cognitive Processes. University of Milano-Bicocca (4 CFU).

2019-2020: Adjunct Professor of Neuropsychology (two courses). Bachelor's Degree in Psychological Sciences and Techniques. University of Milano-Bicocca (4+4 CFU).

2019-2020: Adjunct Professor of Research Methodology. Bachelor's Degree in Psychological Sciences and Techniques of Cognitive Processes. University of Sassari (6 CFU).

2017-2019: Adjunct Professor of Psychometrics. Bachelor's Degree in Psychological Sciences and Techniques of Cognitive Processes. University of Sassari (9+9 CFU).

2019-2021: Adjunct Professor of graduate courses in Neuropsychology (Spazio IRIS, Cattolica University and NeoCortex).

2017-2021: Scientific supervisor of two PhD Students in clinical neuroscience (Silvia Seghezzi and Francantonio Devoto, University of Milano-Bicocca).

SYMPOSIA ORGANIZATION

January 2023. Co-Organizer of the Symposium: “Responsibility in a “we-mode”: from motor interactions to shared decisions. European Workshop On Cognitive Neuropsychology. Brixen, Italy.

September 2022. Co-Organizer of the Symposium: “My body in action: how the sense of agency and ownership shape bodily self-awareness”. Italian Society of Psychology (AIP). Padova, Italy.

June 2021. Co-Organizer of the Symposium: “Characterizing bodily self-awareness from touch to action”. Congress of the European Society for Cognitive and Affective Neuroscience. Budapest, Hungary.

November 2019. Co-Organizer of the Symposium: “The bodily self-consciousness: from touch to action”. Meeting of the Italian Society of Psychophysiology and cognitive neuroscience. Ferrara, Italy.

June 2019. Co-Organizer of the Symposium in honour of Chris and Uta Frith: “The cognitive neuroscience of action control and cooperation”. Milan, Italy.

INVITED TALKS

2022: European Society for Cognitive Psychology. *How the effects of actions become our own: the sense of agency and its neural correlates in healthy and pathological populations.* Lille, France

2022: European Society for Philosophy and Psychology. *How the effects of actions become our own: the sense of agency and its neural correlates in healthy and pathological populations.* Milan, Italy.

2021: European Society for Cognitive and Affective Neuroscience. *How the effects of actions become our own.* Online meeting.

2021: Italian Society of Psychophysiology. *Did I do that? The subjective experience of agency and its neural correlates in healthy and pathological conditions.*

2021: TEDx Varese. *Come nasce il senso di responsabilità.*

2021: Heinrich Heine Universität Düsseldorf. *Did I do that? The subjective experience of agency and its neural correlates in healthy and pathological conditions.*

2021: University of Zurich. *The sense of agency in the human brain.*

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- 2021:** University of Lausanne. *How the effects of actions become our own.*
- 2018:** European Workshop on Cognitive Neuropsychology. *The sense of agency: behavioural and neurofunctional correlates.*
- 2018:** Italian Society of Psychophysiology. *Dissecting the neurofunctional correlates of intentional actions.*

SOCIETIES

SIPF – Italian Society of Psychophysiology and Cognitive Neuroscience; SFN - Society for Neuroscience; SINP - Italian Society for Neuropsychology; AIP - Italian Association of Experimental Psychology.

EDITORIAL & GRANT REVIEW ACTIVITY

I am reviewing grant applications for the Medical Research Council (MRC, UK) and for the Mind Science Foundation (USA). I am reviewing articles for the following journals (see my Publons profile: <https://publons.com/researcher/1328786/laura-zapparoli/>): Brain, Brain Communications, Cerebral Cortex, Cortex, Human Brain Mapping, Neurobiology of Aging, Neuropsychologia, Neuroimage, Neuroimage: Clinical, PLoS One, Psychological Science, Scientific Reports, Consciousness and Cognition, Brain Research, Brain Imaging and Behaviour.

PUBLICATIONS

I'm author of 43 papers published in peer-review journals, 24 as first/last author and 20 as corresponding author (first paper in 2013). My papers are published in high-impact journals, such as *Science Advances*, *PNAS*, *Current Biology*, *Cerebral Cortex*, *Human Brain Mapping*, *Brain Communications*, *Trends in Cognitive Science*. My h-index is 18*/17°; total citations: 847*/650° (Source: *Google Scholar/°Scopus). Average Impact Factor: 4.50. Cumulative Impact Factor: 175.

FULL LIST OF PUBLICATIONS

1. Devoto F, Coricelli C, Paulesu E, **Zapparoli L**. Neural circuits mediating food cue-reactivity: toward a new model shaping the interplay of internal and external factors. *Frontiers in Nutrition*. 2022. doi: 10.3389/fnut.2022.954523.
2. **Zapparoli L**, Devoto F, Giannini G, Zonca S, Gallo F, Paulesu E. Neural structural abnormalities behind altered brain activation in obesity: Evidence from meta-analyses of brain activation and morphometric data. *Neuroimage Clin*. 2022 Sep 5;36:103179. doi: 10.1016/j.nicl.2022.103179.
3. Sacheli L, Verga C, **Zapparoli L**, Seghezzi S, Tomasetig G, Banfi G, Paulesu E. When action prediction grows old: An fMRI study. *Human Brain Mapping*. 2022. doi: 10.1002/hbm.26049
4. Bardakan M, Fink G, **Zapparoli L**, Bottini G, Paulesu E, Weiss P. Imaging the neural underpinnings of freezing of gait in Parkinson's disease. *Neuroimage Clinical*. In press.
5. Saetta G, Ruddy K, **Zapparoli L**, Gandola M, Salvato G, Sberna M, Bottini G, Brugger P, Lenggenhager B. White matter abnormalities in the amputation variant of body integrity dysphoria. *Cortex*. 2022 Jun;151:272-280. doi: 10.1016/j.cortex.2022.03.011.
6. **Zapparoli L**, Paulesu E, Mariano M, Ravani A, Sacheli LM. The sense of agency in joint actions: a theory-driven meta-analysis. *Cortex*. 2022 Mar;148:99-120. doi: 10.1016/j.cortex.2022.01.002.
7. **Zapparoli L**, Mariano M, Paulesu E. How the motor system copes with aging: a quantitative meta-analysis of the effect of aging on motor function control. *Communications Biology*. 2022 Jan 20;5(1):79. doi: 10.1038/s42003-022-03027-2.
8. Salvato G, **Zapparoli L**, Gandola M, Sacilotto E, Ludwig N, Gargano M, Fazia T, Saetta G, Brugger P, Paulesu E, Bottini G. Attention to body parts prompts thermoregulatory reactions in Body Integrity Dysphoria. *Cortex*. 2022, 147: 1-8.
9. Seghezzi S, Convertino L, **Zapparoli L**. Sense of agency disturbances in movement disorders: a comprehensive review. *Consciousness and Cognition*. 2021, Nov;96:103228.
10. Gandola M, **Zapparoli L**, Saetta G, Reverberi C, Salvato G, Squarza S, Invernizzi P, Sberna M, Brugger P, Bottini G, Paulesu E. Brain abnormalities in individuals with a desire for a healthy limb amputation: somatosensory, motoric or both? A task-based fMRI verdict. *Brain Sciences*. 2021 Sep 21;11(9):1248.
11. Paulesu E & Bonandrini R, **Zapparoli L**, Rupani C, Mapelli C, Tassini F, Schenone P, Bottini G, Perry C, Zorzi M. Effects of Orthographic Consistency on Bilingual Reading: Human and Computer Simulation Data. *Brain Sciences*. 2021, 11, 878.
12. Devoto F, Ferrulli A, **Zapparoli L**, Masserini S, Banfi G, Paulesu E, Luzi L. Repetitive deep TMS for the reduction of body weight: bimodal effect on the functional brain connectivity in “diabesity”. *Nutrition, Metabolism and Cardiovascular Diseases*. 2021 Feb 25:S0939-4753(21)00084-3.
13. Negrini F, Ferrario I, Mazziotti D, Berchicci M, Bonazzi M, de Sire A, Negrini S, **Zapparoli L**. Neuropsychological features of severe hospitalized COVID-19 patients at clinical stability and clues for post-acute rehabilitation. *Arch Phys Med Rehabil*. 2021 Jan;102(1):155-158.
14. Devoto F, **Zapparoli L**, Spinelli G, Scotti G, Paulesu E. How the harm of drugs and their availability affect brain reactions to drug cues: a meta-analysis of 64 neuroimaging activation studies. *Translational Psychiatry*. 2020 Dec 14;10(1):429.

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15. **Zapparoli L**, Seghezzi S, Devoto F, Mariano M, Banfi G, Porta M, Paulesu E. Altered sense of agency in Gilles de la Tourette Syndrome: behavioral, clinical and fMRI findings. *Brain Communications*. 2020 Nov 19;2(2):fcaa204.
16. Seghezzi S, **Zapparoli L**. Predicting the sensory consequences of self-generated actions: pre-supplementary motor area as supra-modal hub in the sense of agency experience. *Brain Sciences*. 2020 Nov 7;10(11):825.
17. **Zapparoli L**, Seghezzi S, Sacheli LM, Verga C, Banfi G, Paulesu E. Eyes wide shut: how visual cues affect brain patterns of simulated gait. *Hum Brain Mapp*. 2020 Oct 15;41(15):4248-4263.
18. **Zapparoli L**, Seghezzi S, Zirone E, Guidali G, Tettamanti M, Banfi G, Paulesu E. How the effects of actions become our own. *Science Advances*. 2020 Jul 1;6(27):eaay8301.
19. **Zapparoli L**, Sacheli LM, Seghezzi S, Preti M, Stucovitz E, Negrini F, Pelosi C, Ursino N, Banfi G, Paulesu E. Motor imagery training speeds up gait recovery and decreases the risk of falls in patients submitted to total knee arthroplasty. *Scientific Reports*. 2020 Jun 2;10(1):8917.
20. Saetta G, Hanggi J, Gandola M, **Zapparoli L**, Salvato G, Berlingeri M, Sberna M, Paulesu E, Bottini G, Brugger P. Neural Correlates of Body Integrity Dysphoria. *Current Biology*. 2020 Jun 8;30(11):2191-2195.e3.
21. Sacheli LM* & **Zapparoli L***, Bonandrini R, Preti M, Pelosi C, Sconfienza LM, Banfi G, Paulesu E. How aging affects the premotor control of lower limb movements in simulated gait. *Hum Brain Mapp*. 2020 May;41(7):1889-1903.
22. Negrini F, Preti M, Zirone E, Mazziotti D, Biffi M, Pelosi C, Banfi G, **Zapparoli L**. The importance of cognitive executive functions in gait recovery after total hip arthroplasty. *Arch Phys Med Rehabil*. 2020 Apr;101(4):579-586.
23. Seghezzi S, Giannini G, **Zapparoli L**. Neurofunctional correlates of body-ownership and sense of agency: a meta-analytical account of self-consciousness. *Cortex*. 2019 Dec;121:169-178.
24. **Zapparoli L**, Macerollo A, Joyce EM, Martino D, Kilner JM. Voluntary tic suppression and the normalization of motor cortical beta power in Gilles de la Tourette Syndrome: an EEG study. *Eur J Neurosci*. 2019 Dec;50(12):3944-3957.
25. Gandola M, **Zapparoli L**, Saetta G, De Santis A, Zerbi A, Banfi G, Sansone V, Bruno M, Paulesu E. Thumbs up: Imagined hand movements counteract the adverse effects of post-surgical hand immobilization. Clinical, behavioral, and fMRI longitudinal observations. *Neuroimage Clinical*, 23:101838.
26. Seghezzi S, Zirone E, Paulesu E, **Zapparoli L**. The brain in (willed) action: a meta-analytical comparison of imaging studies on motor intentionality and sense of agency. *Frontiers in Psychology*. 2019 Apr 12;10:804.
27. **Zapparoli L**, Gandola M, Banfi G, Paulesu E. A Breakdown of Imagined Visuomotor Transformations and Its Neural Correlates in Young Elderly Subjects. *Cereb Cortex*. 2019 Apr 1;29(4):1682-1696.
28. Sacheli LM, **Zapparoli L**, Preti M, De Santis C, Pelosi C, Ursino N, Zerbi A, Stucovitz E, Banfi G, Paulesu E. A functional limitation to the lower limbs affects the neural bases of motor imagery of gait. *Neuroimage Clin*. 2018 Jul 5;20:177-187.
29. Devoto F, **Zapparoli L**, Bonandrini R, Berlingeri M, Ferrulli A, Luzi L, Banfi G, Paulesu E. Hungry brains: A meta-analytical review of brain activation imaging studies on food perception and appetite in obese individuals. *Neurosci Biobehav Rev*. 2018 Nov;94:271-285.
30. **Zapparoli L**, Seghezzi S, Scifo P, Zerbi A, Banfi G, Tettamanti M, Paulesu E. Dissecting the neurofunctional bases of intentional action. *Proc Natl Acad Sci USA*. 2018 Jul 10;115(28):7440-7445.
31. Vergallito A, Romero Lauro LJ, Bonandrini R, **Zapparoli L**, Danelli L, Berlingeri M. What is difficult for you can be easy for me. Effects of increasing individual task demand on prefrontal lateralization: A tDCS study. *Neuropsychologia*. 2018 Jan 31;109:283-294.
32. **Zapparoli L**, Tettamanti M, Porta M, Zerbi A, Servello D, Banfi G, Paulesu E. A tug of war: antagonistic effective connectivity patterns over the motor cortex and the severity of motor symptoms in Gilles de la Tourette syndrome. *Eur J Neurosci*. 2017 Sep;46(6):2203-2213.
33. Gandola M, Bruno M, **Zapparoli L**, Saetta G, Rolandi E, De Santis A, Banfi G, Zerbi A, Sansone V, Paulesu E. Functional brain effects of hand disuse in patients with trapeziometacarpal joint osteoarthritis: executed and imagined movements. *Exp Brain Res*. 2017 Oct;235(10):3227-3241.
34. Sacheli LM, **Zapparoli L**, De Santis C, Preti M, Pelosi C, Ursino N, Zerbi A, Banfi G, Paulesu E. Mental steps: Differential activation of internal pacemakers in motor imagery and in mental imitation of gait. *Hum Brain Mapp*. 2017 Oct;38(10):5195-5216.
35. **Zapparoli L**, Seghezzi S, Paulesu E. The What, the When, and the Whether of Intentional Action in the Brain: A Meta-Analytical Review. *Front Hum Neurosci*. 2017 May 17;11:238.
36. Palmer C, **Zapparoli L**, Kilner JM. A New Framework to Explain Sensorimotor Beta Oscillations. *Trends Cogn Sci*. 2016 May;20(5):321-323.
37. **Zapparoli L**, Saetta G, De Santis C, Gandola M, Zerbi A, Banfi G, Paulesu E. When I am (almost) 64: The effect of normal ageing on implicit motor imagery in young elderly. *Behav Brain Res*. 2016 Apr 15;303:137-51.
38. **Zapparoli L**, Porta M, Gandola M, Invernizzi P, Colajanni V, Servello D, Zerbi A, Banfi G, Paulesu E. A functional magnetic resonance imaging investigation of motor control in Gilles de la Tourette syndrome during imagined and executed movements. *Eur J Neurosci*. 2016 Feb;43(4):494-508.
39. **Zapparoli L**, Porta M, Paulesu E. The anarchic brain in action: the contribution of task-based fMRI studies to the

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- understanding of Gilles de la Tourette syndrome. Curr Opin Neurol. 2015 Dec;28(6):604-11.
40. **Zapparoli L**, Invernizzi P, Gandola M, Berlingeri M, De Santis A, Zerbi A, Banfi G, Paulesu E. Like the back of the (right) hand? A new fMRI look on the hand laterality task. Exp Brain Res. 2014 Dec;232(12):3873-95.
 41. Gandola M, Bottini G, **Zapparoli L**, Invernizzi P, Verardi M, Sterzi R, Santilli I, Sberna M, Paulesu E. The physiology of motor delusions in anosognosia for hemiplegia: implications for current models of motor awareness. Conscious Cogn. 2014 Feb;24:98-112.
 42. **Zapparoli L**, Invernizzi P, Gandola M, Verardi M, Berlingeri M, Sberna M, De Santis A, Zerbi A, Banfi G, Bottini G, Paulesu E. Mental images across the adult lifespan: a behavioural and fMRI investigation of motor execution and motor imagery. Exp Brain Res. 2013 Feb;224(4):519-40.
 43. Invernizzi P, Gandola M, Romano D, **Zapparoli L**, Bottini G, Paulesu E. What is mine? Behavioral and anatomical dissociations between somatoparaphrenia and anosognosia for hemiplegia. Behav Neurol. 2013;26(1-2):139-50.