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## BIOGRAPHICAL SKETCH

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NAME: Federica Piras

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POSITION TITLE: Junior PI

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### EDUCATION/TRAINING

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INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Sapienza University of Rome	B.S.	06/1989	Speech and language Pathology
Sapienza University of Rome	M.S.	06/2005	Experimental Psychology
Sapienza University of Rome	Ph.D	06/2009	Cognitive Neuroscience
Institute of Medical Psychology and Behavioral Neurobiology, Tübingen University, Germany		06/2011	Pre/Postdoctoral Training. Behavioral Neurobiology (EEG)

#### A. Personal Statement

In the present position at the Neuropsychiatry laboratory within the Clinical and Behavioral Neurology Department of Santa Lucia Foundation, I'm responsible for the selection of the best set of neuropsychological instruments to capture cognitive deficits in psychiatric patients. I also coordinate several experiments on narrative abilities, reasoning, sense of agency and time perception in different neuropsychiatric samples (Mild Cognitive Impairment, Parkinson Disease, Obsessive Compulsive Disorder, Schizophrenia), which combine cognitive/behavioral testing and diverse brain imaging techniques (EEG, MRI, fMRI, MRS). My acquired expertise in the neurobiology of OCD led to the inclusion of my research group in the ENIGMA-OCD international collaboration, which includes 32 research groups from 16 different countries worldwide. The ENIGMA-OCD Working-Group performed the largest study to date of brain structure in adult and pediatric OCD, employing both meta- and mega-analysis. Within the ENIGMA collaboration, my research group led a meta-analytic study on brain diffusivity measures in OCD patients that included more than 1.400 subjects (between OCD and healthy controls). I've also coordinated, at the national level, a multicentric study on the best neuropsychological predictors of conversion to dementia, which included 500 subjects from the prodromal asymptomatic phase to the early signs of cognitive deterioration. Within several EU funded international research projects, I actively collaborated to the conceptualization, co-design and field testing of some technological solutions aimed at enhancing the functional independence of the elderly population

#### B. Positions and Honors

1986-1989	Baccalaureate in Speech and Language Pathology. Faculty of Medicine, Sapienza University of Rome. 2 years merit-based scholarship awarded by Sapienza University of Rome.
1989-2000	Speech Pathologist, Cognitive Therapy. IRCCS Santa Lucia Foundation, Rome. Head of the Centre for Neuropsychological Cognitive and Behavioral Therapy for Post-Comatose Patients (1995-2000).
1998-Present	Adjunct Professor, "Rehabilitative Techniques for Post-Comatose Patients". Undergraduate Speech Pathology Program, Faculty of Medicine, "Tor Vergata" University, Rome.
2000-2005	Graduate student, Experimental Psychology student. Sapienza University of Rome.
2005-2009	Master in Cognitive Neuroscience student. Sapienza University of Rome.

2008-2011	Pre/Post-Doctoral fellow, Institute of Medical Psychology and Behavioral Neurobiology, Tübingen University, Germany. Supervisor: Prof. N. Birbaumer. Grant as Early Stage Researcher, FP7-PEOPLE-ITN-2008 ITN-LAN
2012-Present	Research Fellow then Senior PI, Laboratory of Clinical and Behavioral Neurology, IRCCS Santa Lucia Foundation, Rome

### C. Contribution to Science

- **Rehabilitation of Neurogenic Cognitive Disorders.** Given the increasing need to evaluate the outcome of rehabilitative interventions not only at the impairment level, but also at the disability level, my studies tried to move beyond the simple question of whether cognitive rehabilitation is effective in order to determine the therapy factors and the patients characteristics that optimize the clinical relevance of rehabilitation.
  - Lobbia A, Carbone E, Faggian S, Gardini S, **Piras F**, Spector A, & Borella E. The efficacy of cognitive stimulation therapy (CST) for people with mild-to-moderate dementia: A review. *European Psychologist*, 2019 24(3), 257–277
  - Capotosto E, Belacchi C, Gardini S, Faggian S, **Piras F**, Mantoan V, Salvalaio E, Pradelli S, Borella E. Cognitive stimulation therapy in the Italian context: its efficacy in cognitive and non-cognitive measures in older adults with dementia. *Int J Geriatr Psychiatry*. 2017 Mar;32(3):331-340.
  - **Piras F**, Carbone E, Faggian S, Salvalaio E, Gardini S, Borella E. Efficacy of cognitive stimulation therapy for older adults with vascular dementia. *Dement Neuropsychol*. 2017;11(4):434-441.
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  - Borella E., Carretti B., Mitolo M., Zavagnin M., Caffarra P., Mammarella N., ..., **Piras F**. Characterizing cognitive inhibitory deficits in mild cognitive impairment, *Psychiatry Research*, Volume 251, 2017, Pages 342-348, ISSN 0165-1781
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  - Borella E, Carbone E, De Beni R, **Piras F**, Piras F “Psicopatologia, demenza e interventi non farmacologici” (Psychopathology, dementia and non-pharmacological interventions) in “Psicologia dell’invecchiamento e della longevità” (Psychology of aging and longevity) Il Mulino 2015
  - **Piras F.**, Borella E, Incoccia C, Carlesimo GA “Disturbi della memoria” (Memory Impairments) in “La riabilitazione neuropsicologica. Un’analisi basata sul metodo evidence-based medicine” (Neuropsychological rehabilitation. An evidence-based method of analysis) Springer ed 2012
  - **Piras F**, Borella E, Incoccia C, Carlesimo GA. Evidence-based practice recommendations for memory rehabilitation. *Eur J Phys Rehabil Med* 2011. Mar;47(1):149-75. Review
  - **Piras F** "Applicazione di metodi cognitivi alla riabilitazione delle funzioni esecutive" (The application of cognitive methodologies in executive functions rehabilitation) in "Le funzioni esecutive. Valutazione e riabilitazione" (Executive functions. Assessment and rehabilitation) Carocci ed. 2010
- **Obsessive Compulsive Disorder.** The most widely accepted model of obsessive–compulsive disorder (OCD) assumes brain abnormalities in the “affective circuit”, mainly consisting of volume reduction in the medial orbitofrontal, anterior cingulate and temporolimbic cortices, and tissue expansion in the striatum and thalamus. The advent of new brain imaging techniques has provided increasing evidence that regions outside the “affective” orbitofronto-striatal circuit are involved in OCD. My work contributed to

establish a broader neuroanatomical model of OCD pathophysiology, which can constitute a platform for further research in the field and contribute to the development of a system-level theory accounting for OCD phenotypic heterogeneity and impaired cognition.

- Weeland CJ, Kasprzak S, de Joode NT, Abe Y, Alonso P, Ameis SH, Anticevic A, Arnold PD, Balachander S, Banaj N, Bargallo N, Batistuzzo MC, Benedetti F, Beucke JC, Bollettini I, Brecke V, Brem S, Cappi C, Cheng Y, Cho KIK, Costa DLC, Dallspezia S, Denys D, Eng GK, Ferreira S, Feusner JD, Fontaine M, Fouche JP, Grazioplene RG, Gruner P, He M, Hirano Y, Hoexter MQ, Huyser C, Hu H, Jaspers-Fayer F, Kathmann N, Kaufmann C, Kim M, Koch K, Bin Kwak Y, Kwon JS, Lazaro L, Li CR, Lochner C, Marsh R, Martínez-Zalacaín I, Mataix-Cols D, Menchón JM, Minuzzi L, Moreira PS, Morgado P, Nakagawa A, Nakamae T, Narayanaswamy JC, Nurmi EL, Ortiz AE, Pariente JC, Piacentini J, Picó-Pérez M, Piras F, **Piras F**, Pittenger C, Reddy YCJ, Rodriguez-Manrique D, Sakai Y, Shimizu E, Shivakumar V, Simpson HB, Soreni N, Soriano-Mas C, Sousa N, Spalletta G, Stern ER, Stevens MC, Stewart SE, Szeszko PR, Takahashi J, Tanamatis T, Tang J, Thorsen AL, Tolin D, van der Werf YD, van Marle H, van Wingen GA, Vecchio D, Venkatasubramanian G, Walitza S, Wang J, Wang Z, Watanabe A, Wolters LH, Xu X, Yun JY, Zhao Q; ENIGMA OCD Working Group; White T, Thompson PM, Stein DJ, van den Heuvel OA, Vriend C. The thalamus and its subnuclei—a gateway to obsessive-compulsive disorder. *Transl Psychiatry*. 2022 Feb 21;12(1):70.
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- **Cognitive and neuropsychiatric correlates of psychiatric and neurodegenerative disorders.** If functional recovery of patients depends on improving cognitive deficits, then understanding the functional, neuroanatomical and molecular basis of the cognitive operations that are usually impaired in neuropsychiatric disorders is essential for developing new therapeutic strategies. Concurrently, investigating the relationship among phenotypic traits (psychopathology/cognition) and their brain correlates, is crucial for the comprehension of pathogenesis in psychiatric disorders and for the neurobiological characterization of neurodegenerative diseases. My studies focussed on the combination of cognitive/behavioral testing and diverse brain imaging techniques in several psychiatric disorders (obsessive compulsive, schizophrenia, bipolar disorder) and neurodegenerative diseases (dementia, Parkinson's disease) as to identify the neurobiological abnormalities mediating the etiology and phenomenology of these illnesses.
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- **Time Perception.** Since the representation of time is necessary to appreciate environmental contingencies and estimate predictive relations between events, and between events and responses, timing helps us to interpret reality. Moreover, temporal cognition is a fundamental “basic unit of ability” on which other cognitive and behavioral processes are based as for example, complex cognitive functioning is largely dependent on underlying temporal constraints. Given the inextricable functional interrelation between interval timing and supportive neuropsychological processes, the neuroscientific study of timing can be a model system to study cognitive dysfunction. In fact pathophysiological distortions in time might depend on and reflect neuropsychological deficits characteristic of definite neuropsychiatric disorders. Specifically, disrupted timing has been reported in illnesses associated primarily with dopaminergic and fronto-striatal dysfunction. My studies moved from the psychophysical properties of time perception in healthy subjects to time distortions in neuropsychiatric illnesses.
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## D. Research Support

### Ongoing Research Support

AAL-2021-8-91-CP

Title: SOLution for healthy Aging and impRoved wellbeing for elderly by breaking down Isolation and empowering care providers (SOLARIA)

Role: Responsible for co-creation

01/10/2022

### Completed Research Support Italian Ministry of Health

RCR-2022-23682290

Title: Application of Artificial Intelligence methods to TELENEUROREHABILITATION: validation of procedures, features extraction for outcome prediction, users' compliance and engagement evaluation  
Financed by the IRCCS 2022 Current Research Projects Fund

Role: Responsible for the WP "Exploring the role of users' adherence, compliance and engagement in predicting the outcome of neurocognitive telerehabilitation programs"

01-01-2022 / 30-06-2024

AAL2019-6-188 CP

Title: ReMember-Me: Smart assistant to prevent and detect cognitive decline, promote cognitive function and social inclusion among older adults

Funded by the European Active and Assisted Living programme.

Role: Responsible for Lab testing, Pilot trials and model training phase of the first prototype conducted in 4 European centres.

01-04-2020 / 31-09-2023

PROG-2090

Title: PENDING: Promotion of mental health well-being through a cognitive rehabilitation model for the early treatment of severe mental disorders

Funded by the Asylum, Migration and Integration Fund 2014-2020

Role: Responsible for the definition of assessment/rehabilitation protocols and data analysis

Italian Ministry of Health (5Xmille 2016-2020)

Title: Multidimensional study of timing abilities and sense of agency in schizophrenia and bipolar patients.

Role: PI

NET2011-02346784

Title: Development of operational research diagnostic criteria for diagnosis of Alzheimer's disease in the preclinical/predementia phase and implementation of SOPs for imaging and CSF biomarkers in Memory Clinics. An integrated care pathway for early diagnosis.

Role: Co-investigator

FP7-PEOPLE-ITN-2008

Title: Initial Training Network for Lateralized Attention Networks.

Role: Early Stage Researcher.

I authorize the processing of my personal data included in the CV, in accordance with Article 13 of Legislative Decree June 30, 2003, No. 196 - "Personal Data Protection Code" and Article 13 of GDPR 679/16 - "European Regulation on the Protection of Personal Data".

Rome, July 12-2024

