 <p>UniSR Università Vita-Salute San Raffaele</p>	<p>CANDIDATURA A SUPERVISORE E PROPOSTA PROGETTO DI RICERCA</p> <p>CANDIDACY AS SUPERVISOR & RESEARCH PROJECT</p>	<p>MO 47-27 rev. 00 del 12/01/2023 PO 47 Pag. 4 di 8</p>
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PROGETTO 1/ PROJECT 1

Supervisore/Supervisor: Sara Poletti

Titolo/Title: Neural underpinning of self-perception and cognitive distortion

Corso /PhD Course Scienze Cognitive e Comportamentali

Curriculum:

Link alla pagina personale OSR/UNISR/ Link to OSR/UniSR personal page: [https://research.hsr.it/en/divisions/neuroscience/psychiatry-OSR/UNISR/ Link to OSR/UniSR and-clinical-psychobiology/sara-poletti.html](https://research.hsr.it/en/divisions/neuroscience/psychiatry-OSR/UNISR/Link%20to%20OSR/UniSR%20and-clinical-psychobiology/sara-poletti.html)


Descrizione del progetto/Project description (Tra i 2.000 e 3.000 caratteri spazi inclusi/
Number of characters, including spaces: 2.000 - 3.000):

Cognitive distortion is a central feature of depression, encompassing negative thinking, dysfunctional personality styles and dysfunctional attitudes. Depressive episodes are characterized by negative thinking and distortions in self-perception, which persist despite clinical remission thus suggesting an enduring cognitive characteristic, which include a negative bias in information processing and in evaluating one's self with increased guilt and both self-deprecatory and self-accusatory thought. Further, depressed patients are hypersensitive to negative past experiences and have the tendency to recall more negative memories. These patients are particularly focused on the past at the expense of future imagination, showing alterations in episodic simulation and abnormalities in Default Mode Network (DMN) during resting state suggesting that the global spontaneous activity of depression is abnormally tilted towards the DMN, meaning an abnormal correlation between DMN and the rest of the brain at a global level².

The present study aims at investigating the neuro-functional basis of episodic simulation and its relationship with the spontaneous/resting state activity of the brain in healthy individuals and patients with major depression by using functional magnetic resonance imaging (fMRI), in order to provide relevant neuronal and psychological markers for a better understanding of depressive syndromes.

To achieve this objective, we will conduct a combined psychological and fMRI experiment using an episodic simulation task implemented by Andrea Scalabrini (University of Bergamo). First, participants will be interviewed to collect a series of personal events from their past and imagined episodes about their future. Second, during fMRI participant will be presented 4 key words related to the events collected during the pre-scan interview. The study is designed with 4 different blocks where participants are asked to represent in their mind the episodes suggested by the cue and to press a button when they have the feeling that the episode is no longer in their mind.

During the three years of duration, the project will aim at (1) recruiting a sample of patients affected by Major Depression (n=30), in charge at our Dept. of Psychiatry, and 30 healthy controls and assess them with the episodic simulation task and a combination of multimodal MRI (DTI, T1, resting state) and neuropsychological assessment (cognition questionnaire) (1st and 2nd year); (2) analyze, with the software AFNI, brain activation and functional connectivity both in resting state and during the execution of the fMRI task and investigate whether these alterations associate with cognitive distortion measured by the cognition questionnaire (2nd and 3rd year); (3) investigate possible correlations between functional abnormalities and structural brain alterations in brain volume and white matter microstructure analyzed respectively with SPM and FSL software.

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Competenze che deve acquisire lo studente/Skills to be acquired by the student (Max 600 caratteri spazi inclusi/ *Number of characters, including spaces: max 600*):

Administration of behavioral tasks to depressed patients and healthy controls
MRI analyses to explore functional & structural networks: task and resting state BOLD fMRI (AFNI and SPM12), Tract-Based Spatial Statistics (TBSS; FSL).
Mediation and moderation analyses to explore the role of intermediate phenotypes.
Machine learning analyses with Elastic Net and multiple kernel learning approaches for the joint analyses of clinical and MRI data.

Bibliografia/References (max. 15)

(1) Bothwell, R. and J. Scott (1997). "The influence of cognitive variables on recovery in depressed inpatients." *J Affect Disord* 43(3): 207-212.
(2) Scalabrini, A., Vai, B., Poletti, S., Damiani, S., Mucci, C., Colombo, C., Zanardi, R., Benedetti, F., Northoff, G. (2020). All roads lead to the default-mode network - global source of DMN abnormalities in major depressive disorder. *Neuropsychopharmacology*.