GRINP: Action-based routes for numbers: unveiling the core networks of reaching, grasping and number processing in brain damaged and healthy individuals

Grasping and Reaching In Number Processing (GRINP) is focused on the study of the neural underpinnings of number processing and its impairment. Number-related deficits can dramatically affect everyday life. Nonetheless, this impairment is often marginally considered in clinical practice, possibly because the complex nature of numerical disorders makes their diagnosis and rehabilitation quite hard. GRINP builds upon action-based theories of cognition - considering many aspects of human cognition as built on motor action - and on the idea that the neural bases for abstract concepts representation are networks of functionally-related recycled mechanisms. Through a comprehensive approach which couples clinical (neuropsychological) with neuroimaging methods (magnetoencephalography), GRINP tests whether number magnitude recruits the same sensorimotor network involved in planning and executing hand movements. GRINP is timely because it relates the cognitive aspects of number and action with the study of their neural dynamics; GRINP is innovative because it promotes at different levels (scientific, clinical, societal) an action-based approach for the understanding of cognitive impairment. GRINP is based on the convergence between the solid expertise of the Fellow in numerical cognition and behavioural research methods, and the long lasting tradition of the Host in neuropsychological and neuroimaging training and research. GRINP will allow the Fellow to restart research in her native country after more than five years of international research/teaching experience and a maternity break. Thanks to the planned training on advanced neuropsychological (voxel-based lesion symptom mapping, brain tractography) and neuroimaging methods (functional connectivity) the Fellow will broaden her expertise from experimental psychology to cognitive neuroscience, putting the bases for a successful longterm career plan.

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