Contribution ID: **580** Type: **Poster**

Does judging orientation elicits Spatial-Numerical Associations? Assessing the neural overlap hypothesis and automaticity of number processing

Thursday, September 11, 2025 2:10 PM (20 minutes)

According to the neural overlap hypothesis (Fias et al., 2001) magnitude information is automatically extracted from digits when there is a sufficient degree of neural overlap of structures dedicated to the processing of relevant and irrelevant information. Specifically, since the semantic information of numbers is processed in parietal areas, processing a visual feature with high parietal involvement (orientation) will interfere with number magnitude while this interference should be limited when processing features with minimal parietal involvement (shape or colour). This seems to be confirmed by the fact that previous studies found Spatial-Numerical Associations (SNA) with orientation tasks but not (or very limited evidence) with shape or colour discrimination tasks. In the present study, we aim to replicate the orientation task by using both digits and letters in separate conditions. Based on the neural overlap hypothesis, a SNARC effect should be found only with digits while it should be weak or absent with letters, due to a low overlap between these stimuli and parietal areas.
A sample of 66 university students performed a line orientation judgement task (superimposed vertical vs. horizontal lines) on numbers and letters in separate conditions. Responses were provided with lateralized left and right keys.
Results revealed no SNAs with both numbers and letters, casting doubts on the neural overlap hypothesis and suggesting that SNAs might be detected in perceptual tasks only by testing extremely large samples (Roth et al., 2025) or by making magnitude information task relevant (Shaki & Fischer, 2023).

If you're submitting a symposium talk, what's the symposium title?

If you're submitting a symposium, or a talk that is part of a symposium, is this a junior symposium?

Primary author: PRPIC, Valter (eCampus University)

Co-authors: GREGORI, Giulia (University of Bologna); MARICONDA, Alberto (Università degli studi di Trieste); PILEGGI, Stefano (Università degli Studi di Trieste); MINGOLO, Serena (University of Calabria); MURGIA, Mauro (University of Trieste)

Presenter: PRPIC, Valter (eCampus University)

Session Classification: Lunch and poster 1

Track Classification: Space, time and number