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Introduction

The **body scheme** is a mental representation of the body's structure and position in space, essential for the coordination of movements in the environment.

Peripheral nervous system diseases can cause sensory neuropathy (paresthesias, impairment in proprioception)

Aim

Our study investigated the impact of dysfunction of the Peripheral Nervous System (PNS) on the body scheme representation.

Methods

52 participants:

- 18 healthy controls
- 11 CANVAS
- 12 anti-MAG antibody neuropathy
- 11 other sensory neuropathy

Statistical analysis: a generalized linear mixed model was applied to assess group differences, considering age, education, and gender as covariates

Task

Letter rotation task
Right/Mirrored



Spatial Mental Rotation
Object-based
transformation task

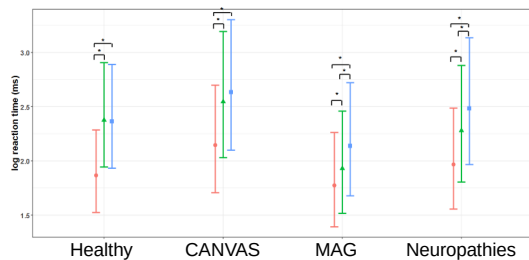
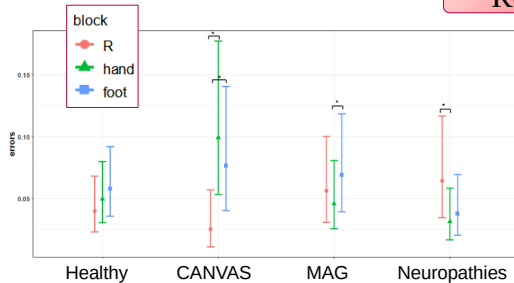
Body rotation task
Right/Left



Mentally simulate moving
themselves into the position
of human figure

Hypothesis: a dissociation between spatial and egocentric mental rotation might be found in peripheral nervous system diseases in contrast to healthy subjects

Results



- No significant differences Peripheral Neuropathies vs. Healthy subjects
- CANVAS: more errors in Body (hand and foot) than in R
- Anti-MAG: more errors in Foot than in Hand
- Neuropathy: more errors in R than in body

- Healthy: slower in Body (hand and foot) than in R
- CANVAS: slower in Body (hand and foot) than in R
- Anti-MAG: slower in Foot than in Hand and R
- Neuropathy: slower in Foot than in Hand and R

Conclusions

PNS disorders do not uniformly impair spatial cognition but may selectively disrupt egocentric transformation abilities, particularly in conditions affecting proprioception and sensory feedback such as CANVAS and anti-MAG antibody neuropathy.

Lower limbs appear especially vulnerable in anti-MAG antibody neuropathy, potentially due to greater proprioceptive impairment in distal parts of the body.