

Treating Temporal Disorders in Spatial Neglect Using Virtual Reality and Prismatic Adaptation

Saturday, September 13, 2025 2:10 PM (20 minutes)

Introduction: The Mental Time Line model suggests that temporal intervals are represented along a left-to-right oriented line. Patients with right brain damage, especially those with neglect (N+), underestimate time durations. This distortion can be reduced by manipulating visuospatial attention, such as through Prismatic Adaptation. Also, a link between the motor system and time perception exists: when individuals perform an action, their temporal encoding becomes more accurate. Based on this evidence, we hypothesized that actively performing movements in a first-person perspective within a Virtual Reality (VR) environment could help reduce the temporal disorders observed in neglect patients.

Methods: N+ patients underwent 10 daily-sessions over 2-weeks of treatment. In the first week, patients completed 5 sessions of PA inducing a leftward after-effect and 5 VR sessions. In the VR scenario, patients performed actions and reproduced or estimated their duration. During second week, neutral PA lenses were combined with VR. To assess temporal deficit, N+ patients performed a Time Reproduction and a Time Estimation Task before, after, and at follow-up (1 week). The performance at baseline was compared with N-patients and healthy controls (HC).

Results: At the baseline, the N+ group reproduced longer temporal intervals and show an underestimation compare with HC and N- patients. Crucially, both manipulations (leftPA+VR; neutralPA+VR) significantly improved N+ patients' performance at each task. These effects were maintained at follow-up.

Conclusion: Our results confirm PA's effectiveness in ameliorating temporal deficits and demonstrate that a VR-based treatment may be used to rehabilitate temporal disorders, offering an engaging rehabilitative context.

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