

Is there a relationship between perseverations and spatial short-term memory deficits in unilateral neglect?

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INTRODUCTION

Spatial neglect is a multicomponent syndrome characterized by an inability to orient or to respond to stimuli arising in the hemispace contralateral to a brain lesion.

It has been proposed that a **spatial short-term memory** deficit may contribute to neglect: a failure to retain previously searched locations might lead to pathological recursive searches towards ipsilesional locations (Husain et al., 2001), and accordingly exacerbate neglect (omissions).

This hypothesis is supported by studies in which the absence of visual feedback in a cancellation task is considered as involving more spatial short-term memory than a condition with visual feedback.

However, the link between perseveration in invisible cancellation and spatial short-term memory has not been directly investigated.

AIM

The aim of this study was to test the hypothesis of a spatial short-term memory deficit being an explanatory factor of perseverations in unilateral neglect.

METHOD

PARTICIPANTS

- 20 right-damaged patients suffering from left neglect
- Control group: healthy adults matched for age and profession

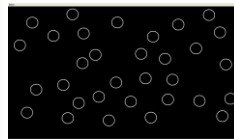
MATERIAL & PROCEDURE

- Computerized version of the Corsi test



- 1 square / second
- Spatial span = the longest sequence in which at least three out of four sequences were correctly reproduced

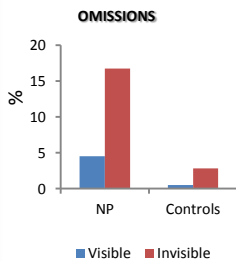
- Cancellation tasks



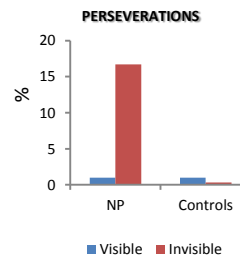
- Condition with visual feedback: targets were marked by increasing visual salience.
- Condition without visual feedback: no marks were left.

RESULTS

CANCELLATION TASKS



Main effect of Group: $F(1,38)=8.34, p<.001, \eta^2=.18$
 Main effect of Condition: $F(1,38)=28.46, p<.001, \eta^2=.43$
 Significant interaction effect: $F(1,38) = 11.12, p=.002, \eta^2=.23$



Main effect of Group: $F(1,38)=18.51, p=.00, \eta^2=.31$
 Main effect of Condition: $F(1,38)=17.48, p=.00, \eta^2=.32$
 Significant interaction effect: $F(1,38) = 16.16, p=.00, \eta^2=.30$

SPATIAL SHORT-TERM MEMORY

- Can spatial short-term memory deficit **explain** perseveration behavior in the invisible condition ? $R^2 = .17, F(1,18) = 3.66, p = .07$

DISCUSSION

- As expected, perseverations and omissions were greater in the invisible condition. However, a spatial short-term memory deficit cannot be considered as an explanatory factor for the perseveration behavior in unilateral neglect.
- In the neglect patients' group, the visual feedback decreases, and even **eliminates** the neglect symptoms (omissions and perseverations) compared to the invisible condition. In other words, the presence of visual feedback can help patients to explore their visual environment.
- We propose that, in the invisible condition, difficulties to plan a visual search could exacerbate both omissions and perseverations, leading to recursive search towards the right side of space and thus promoting failure to explore left space (Mark et al., 2004).