

Exploring Space:

Dissociations and Interactions Between Neglect in Near and Far Regions of Space

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Background

Neglect is a disabling disorder that frequently occurs after right hemisphere stroke (Bowen et al., 1999; Ringman et al., 2004). Neglect refers to failure to report, respond, or orient to stimuli on the contralesional side of space that cannot be accounted for by primary sensory or motor deficits (Halligan et al., 1991; Heilman et al., 2003). Differences have been found in the severity of neglect in different regions of space (Keller et al., 2005). However, much is still unclear about the different degrees of neglect in near- as compared to far-space and its frequency in neurological populations.

Research Question

The aim of the current study is to investigate the frequency, severity, and specificity of neglect in a large group of stroke patients. In addition, dissociations and interactions between near and far space were investigated.

Methods

A group of 105 stroke patients was recruited from the Rehabilitation Centre de Hoogstraat. All had normal or corrected-to-normal acuity. Inclusion criteria: stroke, aged in between 18 and 85 years, no severe deficits in communication and/or understanding, and ability to perform at least two tests at both distances.

To test the presence and severity of neglect, a neglect screening battery was administered to all patients in Near and Far space. This battery included two target cancellation tests (star cancellation (SC), letter cancellation (LC)), and line bisection (LB).

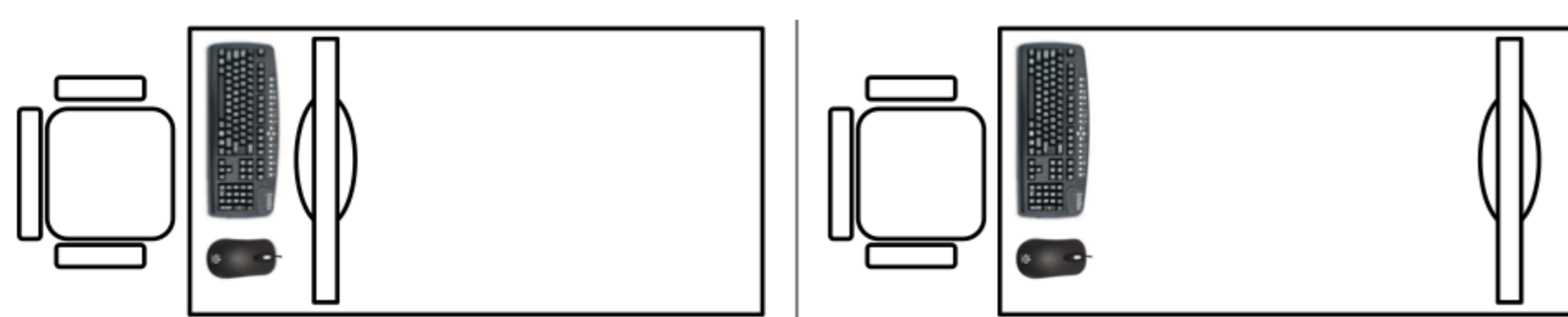


Fig. 1 Experimental setup for near (30 cm distance, left) and far space (120 cm distance, right)

Analysis

We divided patients into four groups based on their performance on each of the tests: No Neglect, Near Neglect, Far Neglect, Near and Far Neglect. For the SC and the LC we calculated the center of cancellation (CoC) for each participant in each region of space. On the LB we calculated the average deviation from the center of the line in degrees of visual angle.

Results

Using repeated measures ANOVA's, we found significant interactions between space and performance on the SC (CoC-x & y), the LC (CoC-y) and the LB.

Table 1. Percentage of patients in each group on the three tasks

Type/Test	SC	LC	LB
N-F-	58%	48%	70%
N+F-	19%	19%	14%
N-F+	6%	13%	7%
N+F+	17%	19%	9%

Results

Star Cancellation

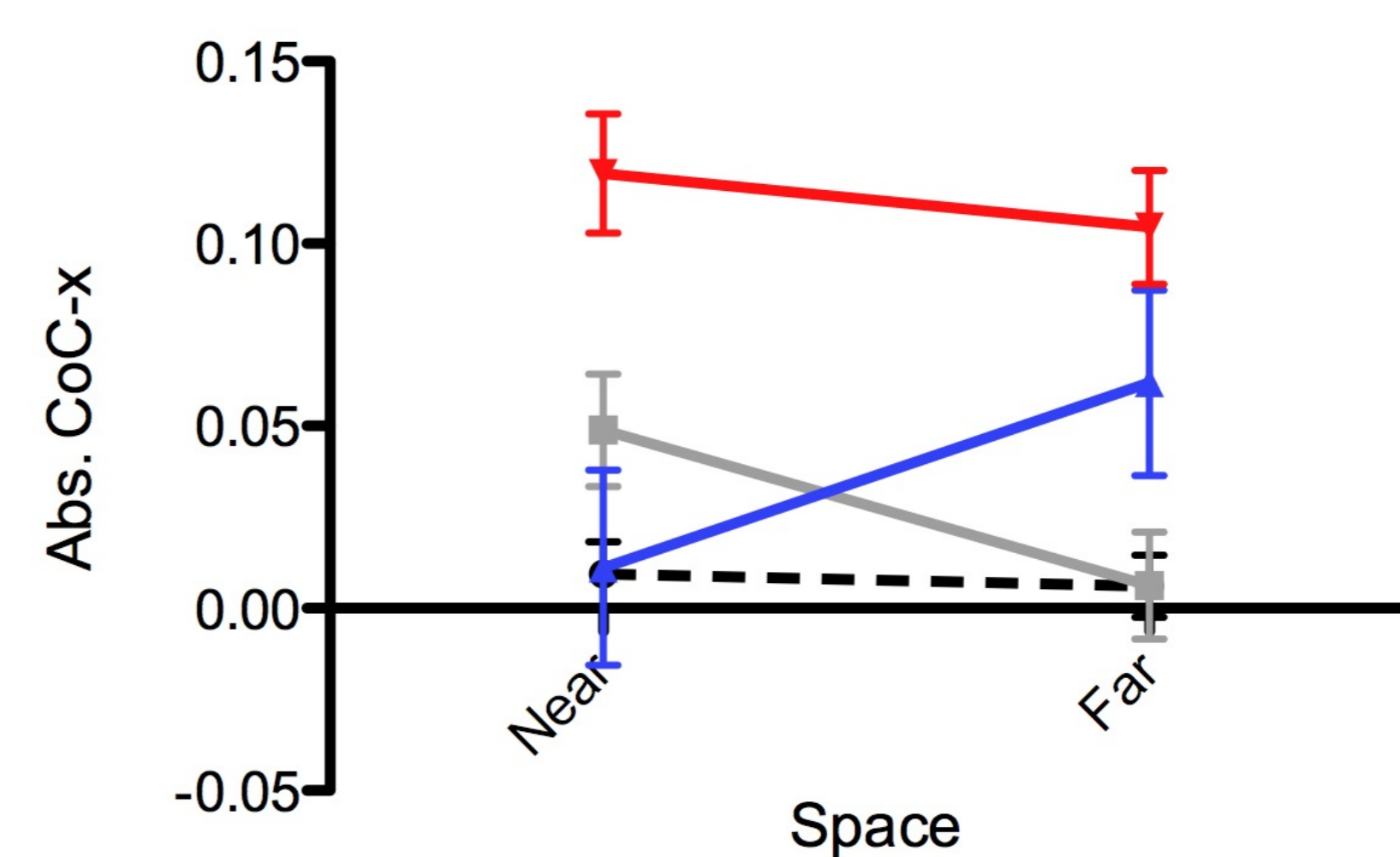


Fig. 2 Results from the SC (absolute CoC-x) for each of the patient groups.

Letter Cancellation

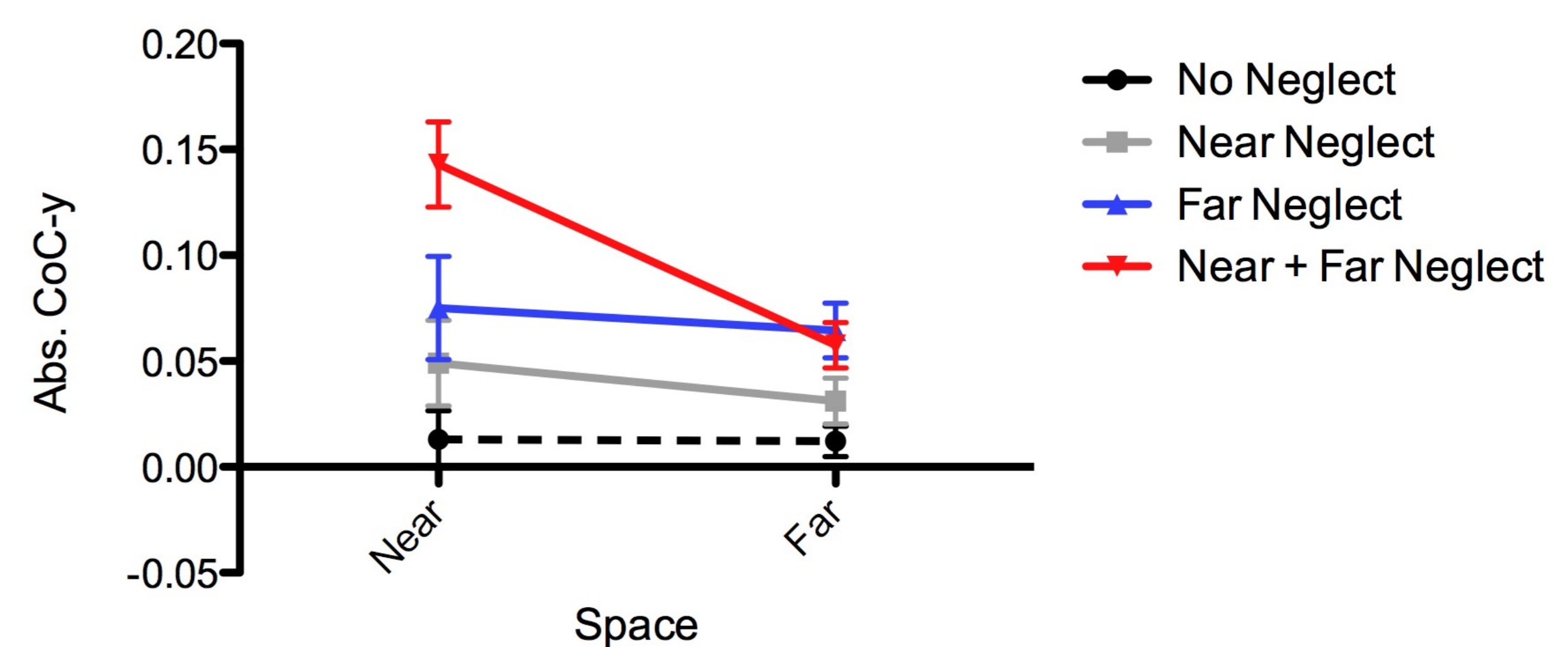


Fig. 3 Results from the LC (absolute CoC-y) for each of the patient groups.

Line Bisection

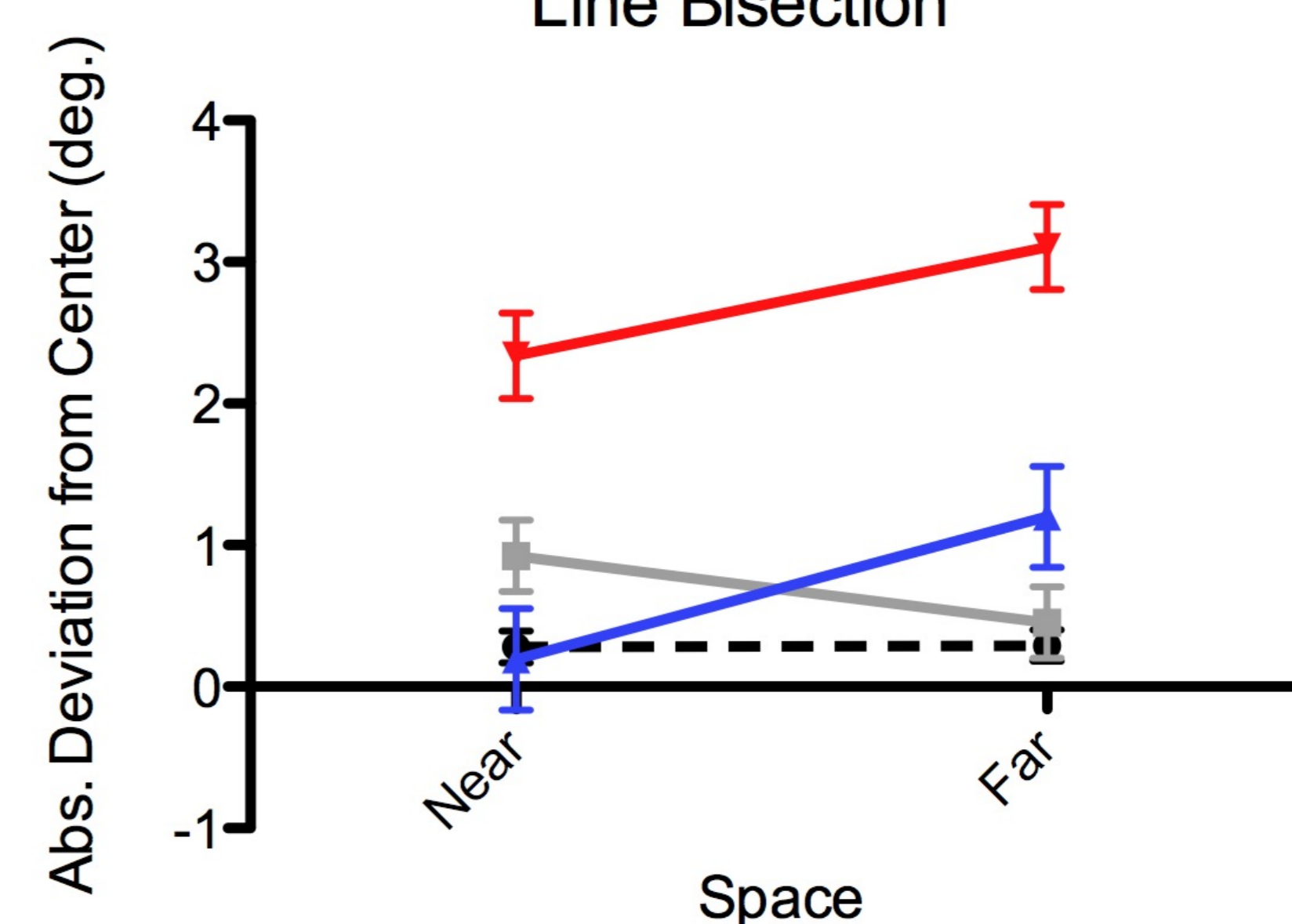


Fig. 4 Results from the LB (absolute deviation from center in degrees) for each of the patient groups.

Conclusions

- Patients can have different degrees of neglect in near- and far-space as shown by their performance on standard neuropsychological tests.
- Standard neglects tests only measure performance in near space. Because far space is often associated with orienting and navigation, detecting far space neglect will have important consequences for diagnostics and rehabilitation.
- These results give us more insight into the behavioural results of different types of neglect on various tests that are often used to measure this disorder.



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