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Impairments in multisensory integration after stroke

Supplementary materials

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Race model inequality violation in the patient group

The patient group consisted of patients with left sided, right sided, and subcortical/cerebellar brain damage. Depending on the lesion, some patients may have been able to integrate auditory and visual information and others not, resulting in significant RMI violation at a group level (all patients together). To more thoroughly investigate the impact of specific lesions on MSI, RMI violations were also analyzed in relation to target side (contra- vs. ipsilesional) and lesion side (left vs right hemisphere) in the patient group. Patients were divided into a left and a right cortical lesion group. There were 11 patients with cortical lesions in the left and 7 patients with cortical lesions in the right hemisphere (see Table 1, see Figure 3 for lesion overlay plots). Three patients had brainstem and/or cerebellar lesions without cortical lesions and were excluded from this analysis (N = 3).

The left cortical lesion group (N = 11) showed no RMI violations for targets that were presented in the contra- or the ipsilesional side of space (all $p > .4$). The lack of RMI violations demonstrate that multisensory response enhancement in the left hemisphere lesion group could be fully explained by independent processing of auditory and visual input and indicates a lack of MSI. In contrast, the right hemisphere lesion group (N = 7) showed RMI violation at the 40^{th} percentile for contralesional targets and at the 30^{th} and 40^{th} percentile for targets presented in the ipsilesional part of space (all $p < .05$, see Figure 2D). Although the number of quantiles at which RMI violations were observed in the right hemisphere group is smaller than in the healthy control group, these results clearly indicate that auditory and visual input was integrated in the right hemisphere lesion group. The mean amount of RMI violation was compared between the left and right hemisphere lesion group using two Mann-Whitney U tests. There was a significant difference between the left and the right hemisphere group for contra- ($U = 16.00$, $p = .044$) and ipsilesional targets ($U = 10.00$, $p = .008$), in line with reduced RMI violation in the left relative to the right hemisphere group.