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POSSIBLE RECODING OF VISUAL SPACE IN COVERT ORIENTING TASKS

G. BERLUCCHI*, S. AGLIOTI, L. CHELAZZI, A. PERU AND G. TASSINARI

Dipartimento di Scienze Neurologiche e della Visione, Sezione di Fisiologia umana, Università di Verona, Strada Le Grazie 8, I-37134 Verona, Italy

INTRODUCTION

Experimental evidence and everyday experience about visual cognition and action indicate that observers tend to partition the visual field in relation to its main meridians passing through the fixation point. The central vertical meridian normally provides the distinction between left and right, and the central horizontal meridian normally provides the distinction between up and down. This oculocentric frame of reference is open to influences not only from headcentric and bodycentric components of spatial coding (5), but also from the momentary deployment of attention in the visual field. The focus of visuospatial attention can be voluntarily dissociated from the line of sight (14), and in some cases at least it is this focus, rather than the fixation point, that functions as the nodal point of the reference system for segmenting space into its lateral or altitudinal halves. Cases of visuospatial recoding based on the direction of the attentional focus have been described, for example, in spatial stimulus-response compatibility tasks, where compatibility effects have been determined by the right or left positions of the stimuli relative to the attentional focus rather than the fixation point (e.g. 11, 12).

In previous papers we have described a visuomotor reaction time (RT) task which produces different effects on different sides of the vertical meridian. Simple manual RT for detecting a light target, henceforth called S2, at an extrafoveal location is increased if that location has recently received another light stimulus, henceforth called S1. Following Posner et al. (16), this effect has been called inhibition of return (e.g. 1, 17, 22), and attributed by Posner and Cohen (15) to a local inhibition that serves to redirect attention to other locations, thus favoring a balanced exploration of the entire visual field. We have additionally described a smaller but very robust inhibitory effect from extrafoveal S1s remote from extrafoveal S2s, but occurring on the same side of the vertical or horizontal meridians (ipsilateral inhibition). More precisely, RT to S2s preceded by S1s in the same hemifield is systematically longer than RT to S2s preceded by contralateral S1s at stimulus-onset-asynchronies (SOAs) that vary from 0 to over 3 sec (2, 23-28). Ipsilateral inhibition is usually demonstrated with S1s that do not predict the

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