Key Note

# Chapter 14: Attention and awareness

## Key note 14A: Exogenous and endogenous attention: Relationship with magno- and parvo-cellular divisions of the visual pathway

The evidence above suggests that exogenous and endogenous attention may involve different neural systems, but which systems? In Chapter 3, we noted that the magno (M)- and parvo-cellular (P) divisions of the visual pathway had difference temporal characteristics (transient and sustained, respectively). Yeshurun and Sabo (2012) asked whether the two types of attention had separable effects on these two subdivisions, using so-called steady and pulsed pedestal stimuli. A steady pedestal stimulus consists of a briefly presented target on a background of unchanging luminance. In a pulsed pedestal stimulus, an increase in background luminance (a pedestal) begins and ends simultaneously with the brief target. These stimuli are thought to favour the M and P systems respectively, since, for example, contrast sensitivity for low spatial frequencies is higher for steady pedestal stimuli, a hallmark of M activity. Participants fixated in the centre of an array of four boxes on a computer screen. On each presentation, the same luminance pedestal (either steady or transient), appeared in each box, with the target appearing in only one box. On half the presentations, the target was cued by a single white disc which appeared over its box. On the other half (baseline presentations), a white disc appeared over all four boxes. Each of these brief displays which included the target was either preceded or followed by an otherwise identical display which included the luminance pedestals, but no target. The task was to report in which interval the target appeared. The difference between the cued and baseline conditions was not significant for the steady pedestal conditions (which favour the M system), but was for the pulsed pedestal conditions (which favour the P system). The authors concluded that exogenous attention modulates the P more than the M system, and suggested that P system involvement would, for example, improve spatial resolution and help the perceiver decide whether to allocate further resources to process the stimulus which had triggered exogenous attention.

Yeshurun Y, Sabo G (2012) Differential effects of transient attention on inferred parvocellular and magnocellular processing. *Vision Research* 74: 21–29.