Deficits of spatial and task-related attentional selection in mild cognitive impairment and Alzheimer's disease.

Visual selective attention was assessed with a partial-report task in patients with probable Alzheimer's disease (AD), amnestic mild cognitive impairment (MCI), and healthy elderly controls. Based on Bundesen's "theory of visual attention" (TVA), two parameters were derived: top-down control of attentional selection, representing task-related attentional weighting for prioritizing relevant visual objects, and spatial distribution of attentional weights across the left and the right hemifield. Compared with controls, MCI patients showed significantly reduced top-down controlled selection, which was further deteriorated in AD subjects. Moreover, attentional weighting was significantly unbalanced across hemifields in MCI and tended to be more lateralized in AD. Across MCI and AD patients, carriers of the apolipoprotein E ?4 allele (ApoE4) displayed a leftward spatial bias, which was the more pronounced the younger the ApoE4-positive patients and the earlier disease onset. These results indicate that impaired top-down control may be linked to early dysfunction of fronto-parietal networks. An early temporo-parietal interhemispheric asymmetry might cause a pathological spatial bias which is associated with ApoE4 genotype and may therefore function as early cognitive marker of upcoming AD.