

REDUCED INTERFERENCE EFFECT ON TOPOGRAPHICAL WORKING MEMORY IN MILITARY PILOTS

RÉDUCTION DE L'EFFET DE L'INTERFÉRENCE SUR LA MÉMOIRE TOPOGRAPHIQUE À COURT TERME DANS LES PILOTES

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Introduction: Spatial navigation enables humans to move through a new or familiar environment to reach a target. It requires a contribution from several processes such as memory, cognitive flexibility, mental imagery and planning. It is a very complex ability that encompasses all four stages of human information processing (sensory input, perception/cognition, selection, and execution of an action), involving both cognitive and physical requirements. During flight, the pilot uses all of these stages and one of the most critical aspect is interference. In fact, spatial tasks competing for the same cognitive resource cause greater distraction from a concurrent task than another task that uses different resource modalities.

Methods: We compared the performance of pilots and nonpilots of both genders performing increasingly complex navigational memory tasks while exposed to various forms of interference. We investigated the effects of four sources of interference: motor, spatial motor, verbal, and spatial environment.

Results: We found that flight experts perform better than controls (Pilots: 6.50 ± 1.29 ; Nonpilots: 5.45 ± 1.41). In the general population, topographical working memory is compromised only by spatial environmental interference (Nonpilots: 4.52 ± 1.50) and women were less able than men. The flight expert group showed the same interference, even if reduced (Pilots: 5.24 ± 0.92); but women and men pilots did not differ in performance.

Conclusions: Spatial environmental interference is the only interference producing a decrease in performance. Nevertheless, pilots are less affected than the general population, probably as a consequence of the need to commit substantial cognitive resources to process spatial information during flight.