Mental Rotation Performance as a function of Sex, Aging and Forgetfulness

Literature suggests that declining mental rotation ability may be associated with prodromal Alzheimer's Disease (AD) or Mild Cognitive Impairment (MCI). Moreover, screening tests for AD and MCI that focus on non-amnestic symptoms are of great interest to clinicians. Although sex differences are robust in mental rotation tasks and performance is often found to decline with age, we set out to establish how healthy older adults would perform on a fully computerized mental rotation task. Here, we report findings from a large group of aging adults (n=282; ages 56-89) who were remotely administered a mental rotation task as part of a larger California Cognitive Assessment Battery (CCAB). Participants were required to decide as quickly as possible whether a letter was in its typical (e.g., R) versus mirror-reversed (Я) orientation. Letters were presented upright (at 0 degrees) or rotated (+/-60, or +/-120 degrees). Reaction times (RT) and accuracy were captured and analyzed to determine whether the standard pattern of increased RT for increased angle of rotation could be replicated and whether any sex or age differences could be observed using this remotely administered task. Importantly, both sex and age were significantly associated with performance. Analysis also revealed a pattern of longer response times with greater rotation angle. Interestingly, females performed better overall, while males experienced smaller costs based on rotation angle. Finally, both increasing age and forgetting scores were associated with worsening performance. Longitudinal assessment at 6-month intervals is ongoing to establish further trends in mental rotation performance in healthy aging.

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