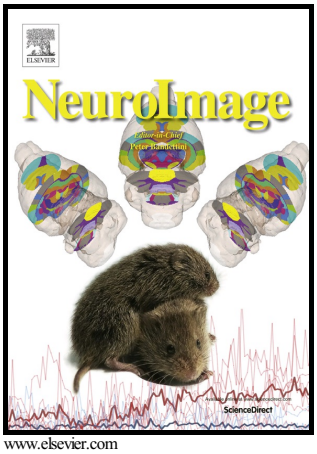

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A Virtual Water Maze Revisited: Two-Year Changes in Navigation Performance and their Neural Correlates in Healthy Adults

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Abstract

Age-related declines in spatial navigation are associated with deficits in procedural and episodic memory and deterioration of their neural substrates. For the lack of longitudinal evidence, the pace and magnitude of these declines and their neural mediators remain unclear. Here we examined virtual navigation in healthy adults (N=213, age 18-77 years) tested twice, two years apart, with complementary indices of navigation performance (path length and complexity) measured over six learning trials at each occasion. Slopes of skill acquisition curves and longitudinal change therein were estimated in structural equation modeling, together with change in regional brain volumes and iron content (R2* relaxometry). Although performance on the first trial did not differ between occasions separated by two years, the slope of path length improvement over trials was shallower and end-of-session performance worse at follow-up. Advanced age, higher pulse pressure, smaller cerebellar and caudate volumes, and greater