



ANFA 2014 CONFERENCE

PRESENTER ABSTRACTS
ACADEMY OF NEUROSCIENCE FOR ARCHITECTURE

Familiar Environments Enhance Object and Spatial Memory in Both Younger and Older Adults

NIAMH MERRIMAN

*School of Psychology and Institute of Neuroscience, nmerrim@tcd.ie
Dublin, Ireland*

JAN ONDREI², EUGENIE ROUDAIA¹, CAROL O'SULLIVAN² AND FIONA N. NEWELL¹

*School of Psychology and Institute of Neuroscience¹;
Graphics, Vision and Visualisation Group, School of Computer Science and Statistics²
Dublin, Ireland*

1. EXTENDED ABSTRACT

Wayfinding and spatial navigation abilities are known to decline with ageing. Although few studies have considered the role of familiarity of the environment on object or spatial memory, some evidence suggests that older adults have preserved spatial recognition for familiar environments learned in the remote past. Here, we investigated whether familiarity with an environment affects spatial memory in younger and older adults. A realistic virtual model of a local environment (i.e., Trinity College Dublin) was used to create videos of two routes taken through the west and east end of the environment in a first-person perspective. Forty-eight younger (mean age = 23 years) and 23 older (mean age = 69 years) took part in the study. Prior to testing, all participants provided familiarity ratings for the east and west ends of the real campus environment. Based on these ratings, there were two groups of (24) younger participants: one group was familiar with both areas and the other was more familiar with the west end. The older adults all rated the west end as more familiar than the other. During the experiment, participants viewed videos of two routes and were asked to remember the route taken and the objects embedded into the environment. Following learning, spatial memory was tested using 4 separate tasks: a landmark recognition test (a measure of object memory), a direction judgement task (a measure of egocentric spatial processing), a proximity judgement task, and a landmark location task (measures of allocentric spatial processing). We found relatively worse performance for the older than younger adults across all spatial tasks, although allocentric memory was more compromised in the older than younger adult groups. Importantly, area familiarity within the environment was associated with improved landmark recognition and egocentric spatial processing in younger adults who were familiar with one area and in older adults. These results suggest an important facilitatory role of environment familiarity on object recognition and spatial memory and may have implications for enhancing spatial memory in older adults.

2. AUTHORS

Niamh Merriman is a PhD Student in School of Psychology and Institute of Neuroscience whose research interests include the study of multisensory integration and spatial cognition in healthy older adults and fall-prone older adults under ecologically valid conditions using virtual reality. The over-arching goal of this research is to inform rehabilitative interventions for those with impaired spatial cognition.

Jan Ondrei is a postdoctoral research fellow in GV2 group at Trinity College Dublin. His research interests are in computer graphics and virtual reality, especially in a realistic simulation and animation of autonomous virtual humans.

Eugenie Roudaia is a post-doctoral fellow in the Trinity College Institute of Neuroscience and is interested in visual and multisensory perception and how perceptual function changes with ageing, as well the interaction between perceptual function and balance in older age. She is also interested in perceptual learning and brain plasticity across the lifespan.

Prof. Carol O'Sullivan is the Coordinator of the VERVE project. She is the

Professor and Chair of Visual Computing in Trinity College Dublin. Her research interests encompass computer graphics, animation, perception, human and crowd simulation.

Fiona Newell is a Professor in the School of Psychology and Institute of Neuroscience, Trinity College Dublin. Her research interests are in human sensory and perceptual processes. The main goal of her research is to provide a better understanding of how information is shared across the senses and to elucidate the brain processes involved in the perception of objects, faces and places across the main human sensory systems. Her recent research has focused on a more life-span approach, particularly on how the ageing process affects multisensory perception and spatial cognition.

