∗ Lokka, I-E., Çöltekin, A. (2019). Age differences in attention and memory in a virtual reality route learning task. In 5th International Conference Aging & Cognition EUCAS2019. Apr 24-26

Age differences in attention and memory in a virtual reality route learning task

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We present observations from a comparative study in which older (65-75 yo., n=39) and younger (20-30 yo., n=42) participants learned a route in a virtual city. The goal of the study was to examine if we could improve participants' route recall accuracy with a virtual city by manipulating the scene content. We manipulated the scene content as informed by previous studies on visual realism, landmark theories, and cognitive load. Participants answered a series of questions that we designed to measure the recall of — what we considered— *visual*, *spatial* and *visuospatial* details, first immediately after the experiment, then a week later. Our previous findings indicate that our visualization manipulations overall facilitate better route recall (Lokka et al. 2018; Lokka and Çöltekin 2017). Here we consolidate our many observations regarding age-related and visualization-related performance differences in route recall; and explain some of the findings with the help of an eye movement analysis.

In the context of analyzing the reasons behind the performance differences, we examined how different are the best and worst performers. We found that the top 10 performers (irrespective of age, though majority of high performers are young) have an overall recall success at an impressive 99%, whereas the worst 10 performers achieve only about 47%. This difference motivates us to examine their visual strategies further, thus we include an eye movement analysis of participants' strategies in our presentation at the conference.