

Eye gaze preference to objects or locations in a virtual hallway ?

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In the field of spatial cognition the notion of landmarks plays an important role. It is not clear, however, which objects in the world are actually used in a navigation task. Two factors influencing landmark selection are (i) the physical property of an object compared to its surrounding (its “contrast to the environment”) and (ii) the location of the object. As a behavioral approach to landmark selection, we recorded eye movements during a navigation task and examined the gaze on certain objects and locations. From eye movement studies during sequential tasks in natural environments (i.e. *Land & Hayhoe (2002): In what ways do eye movements contribute to everyday activities? Vision Research, 41, 3559-3566*) it is known that task-relevant objects are fixated preferential and only just a few milliseconds in advance of an action.



In our experiment subjects have to drive through a virtual hallway, navigating with a joystick. The virtual world is projected onto a curved, tilted, conical screen, with a field-of-view of 150° in horizontal and 70° in vertical direction (Fig. to the left). Every subject performed two experiments. The first was a control condition, where subjects had to reproduce a certain route through the hallway. In the second experiment the positions of 21 (out of 90) objects in this hallway have been changed, the subjects again are asked to drive the same route. The new object locations have

been chosen with respect to formerly measured gaze frequency: objects which are fixated more frequently are changed with objects which are rarely fixated.

In the evaluation the frequency of gazes to the same objects in different locations are compared. Furthermore we analysed fixations to the same locations, now filled with different objects.

Our data show a correlation of the gaze frequency between experiment 1 and experiment 2 for the objects as well as for the locations ($r = 0.89$; $r = 0.88$) if this correlation is computed for all objects in the hallway. When the correlation is rendered only for the 21 changed objects, the correlation is reduced ($r = 0.23$; $r = 0.20$). From this result we can conclude that neither the physical property of an object nor the location alone could explain the eye gaze pattern.