

The development of visually guided locomotor planning

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Background

Motor planning uses visual information to predict endstate and select appropriate action sequences. Most investigations of such planning, including its development, have studied manual actions. Our 'river crossing' task is designed to examine the visually guided planning of locomotion.

Method

Participants have to cross a 'river' using stepping stones forming two alternative paths. The final gap is easy in one path, and of variable length and difficulty in the other. The initial movement may require either easy or difficult foot placements.

Results

For adults, and groups aged 3.5, 4.5 and 6 years, the choice of initial action shows significant effects of final gap size, age, and an age*gap interaction. The results demonstrate complex planning in the locomotor domain as early as 3.5 years, much earlier than in manual tasks

(Smyth and Mason, *J Child Psych Psychiat*, 38, 1023, 1997; Newman, UCL PhD thesis, 2001). Initial planning abilities are followed by substantial developmental refinement. Children's planning errors can be contrasted with their near-perfect performance on a control task requiring direct perceptual judgment of gap size from the starting location.

Conclusions

This task shows new evidence for complex visuomotor planning in young children. It will be extended to examine longer forward planning (more stepping stones) and the need to process further new information for avoidance (projected 'animals' that block parts of the path once movement has begun).

Keywords Development • Planning • Locomotion • Vision • Obstacles

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