SCIENTIFIC REPORTS

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K[illegible] P[illegible], A[illegible] C[illegible], C[illegible] F[illegible], N[illegible] B[illegible] [illegible] M[illegible] N[illegible]

it is irrelevant are consistent with the possibility that they rely heavily on visual information, e.g. to calibrate other sensory cues.

participants received the study information and gave their consent to participate, the experimenters measured their interpupillary distance (IPD). This measure was used to set the rendering of the virtual environment appropriately for correct stereoscopic depth perception for each participant during the study. The experimenters also asked participants to wear a pair of foam earplugs and to close their eyes until the experimenter asked them to open them again. This was done to prevent participants from using any background noise and/or the real room layout and floor markings to orient themselves during the task. Then one of the experimenters guided the participant inside the real room and the two experimenters positioned the HMD on the participant's head, ensuring that it was well fitted (i.e.,03 Tc ds hs ppariciant would wn4.5(l)11.4(u)0.5(s)57.5(oe04.5(le0.5(a)-.5(n)12.5(ay0.5(t)-6.5(h
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#ÏÎÄÉÔÉÏÎ 68 On each trial participants were positioned at the selected start point and were asked to stand still while wearing the HMD. In this condition participants did not walk but watched a pre-recorded walk of the path in the virtual room. The pre-recorded path was obtained by asking one average-height child and adult to walk along each of the four paths in the real room (all presented as one path in the virtual room). The average height for the examined age range was 1.70 m (average between female and male average heights) for adults and 1.40 m for 10- to 11-year-old children as reported by the National Institute for Care and Health Excellence[26]. The child and adult who provided these recordings did not participate in the study. The experimenter informed the participant when the recording started and ended. When the recording reached the end (i.e., the participant reached the end of the two-legged path), participants clicked a wireless mouse, which blacked out the virtual room and put participants in darkness. Then participants were asked to reproduce the path in darkness and stop when they thought that they had reached the original end point.

C[illegible] V+

changes in constant error in either single cue condition, the effect is more likely due to changes in weighting for the two cues during combined-cue trials.

Control analyses. In addition to the main analysis we carried out some control analyses. First of all, we examined whether the difference in height between the templates used during the pre-recording for the V condition and the child and adult participants affected the data. To test for this, we examined whether there was any relation between the difference in template-participant height and the length walked by each participant for the first and second leg of the path by running a series of Pearson's correlation tests (see Supplementary Figure S2). Additionally, we tested whether the difference in template-participant height correlated with the measures of turning angle and constant error in the V condition. No significant correlation was found between the difference in template-participant height and these measures for either adults (all $p \geq 0.650$) or children (all $p \geq 0.645$). Hence, the templates provided good simulations of participants' walking patterns and minor discrepancies in height did not affect the data.

Next, we checked the extent to which there were over or underestimations of length and turning angle in the different sensory conditions, for adults and children. This was done to better understand how different components of the path contributed to the overall measures of variable and constant error. To this end, we examined whether the average length walked by participants for the first and second leg of the path differed significantly from the real length and whether the average turned angle differed from the real angle (see Supplementary Figure S3). One sample t-tests showed that both adults (V: $t(17) = -6.529$, $p < 0.001$; V + SM: $t(17) = -5.413$, $p < 0.001$) and children (V: $t(14) = -6.674$, $p < 0.001$; V + SM: $t(14) = -2.626$, $p = 0.02$) significantly underestimated the length for the V and V + SM conditions when walking the first leg of the path. Only adults significantly underestimated this length in the SM condition (adults: $t(17) = -3.473$, $p = 0.003$; 10-11y: $t(14) = 1.122$, $p = 0.281$). Both adults (V: $t(17) = -6.833$, $p < 0.001$; V + SM: $t(17) = -4.664$, $p < 0.001$; M: $t(17) = -3.800$, $p = 0.001$) and children (V: $t(14) = -6.108$, $p < 0.001$; V + SM: $t(14) = -2.935$, $p = 0.011$; M: $t(17) = -2.191$, $p = 0.046$) significantly underes-

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