

useful to extend to a broader population including elderly participants. Spatial ability assessment provides the potential to act as an early stage diagnostic tool for Alzheimer's dementia (AD), because spatial disorientation is one of the earliest symptoms [24, 44–48]. Currently there is no standardized test for navigation deficits with AD patients, as diagnostics measures are still focused on episodic memory deficits, despite their low sensitivity and specificity for identifying at-risk individuals [26]. Sea Hero Quest wayfinding task having real-world ecological validity holds future promise for controllable, sensitive, safe, low-cost, and easy to administer digital cognitive assessment.

Supporting information

S1 Fig. Wayfinding virtual task. Maps of wayfinding Sea Hero Quest levels 1, 6, 11, 16 and 43. Starting position and facing direction are indicated by a pale blue arrow, ordered goals by red flags. Participants must memorize the map, and then navigate towards the goals in the right order as quick as possible.

(PDF)

S2 Fig. Wayfinding real-world task in London (UK). Maps of real-world wayfinding routes (top). Starting position and facing direction are indicated by a yellow arrow, ordered goals by red dots. Participants must memorize the map, and then walk towards the goals in the right order as quick as possible. Goals are materialized by remarkable doors (bottom).

(PDF)

S3 Fig. Wayfinding real-world task in Paris (France). Maps of real-world wayfinding routes (top). Starting position and facing direction are indicated by a green arrow, ordered goals by yellow dots. Participants must memorize the map, and then walk towards the goals in the right order as quick as possible. Goals are materialized by remarkable facade (bottom).

(PDF)

S4 Fig. Path integration task in the virtual and real-world environments. **A**—Maps of Sea Hero Quest path integration levels 14, 34, 44, 54 and 74. **B**—Itineraries of the path integration task in Paris (France). Each color corresponds to a different itinerary.

(PDF)

S5 Fig. Path integration gender effect. Gender differences for the path integration task in the video game (right) and in the real world (left) in Paris. In the real world, path integration performance is the opposite of the average error angle. In the video game, path integration performance is the average number of stars. Both measures have been standardized for comparison. Black dots represent individual data points. Error bars represent standard errors.

(PDF)

S1 Video. Visualization of the wayfinding task in London and in the video game. Credits to OpenStreetMap contributors.

(MP4)

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Author Contributions

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