



Contribution ID: 68

Type: **Talk**

## Development and Validation of Virtual Reality Tasks for Measuring Planning Ability

*Wednesday, 11 September 2024 14:30 (20 minutes)*

Planning is a high-order executive function typically assessed by problem-solving tasks. Traditional assessments often lack ecological validity due to their simplicity and decontextualization. To address this, assessment based on immersive technology has been developing. In this study, we adapted a planning task from the serious computer game CCRacer for virtual reality. Participants had to navigate an intersection grid to collect objects (apples) and deliver them to a final point, with measures of inefficiency, initial time, total time, and time ratio.

We gathered data from 62 emerging adults (37% male) and administered four cognitive tests: CCRacer-planning, VR CCRacer-planning, Tower of London, and Traveling Salesman Problem. Participants reported their interest, motivation, task difficulty, and immersion for each. We evaluated symptoms induced by virtual reality equipment (nausea, disorientation, dizziness, fatigue, instability). Test-retest reliability of VR CCRacer-planning scores was examined with 24 participants.

Results indicated that time-related measures were reliable indicators of planning ability, while inefficiency lacked structural validity and reliability, likely due to insufficient task difficulty. All measures demonstrated satisfactory test-retest reliability and appropriate correlations with related cognitive tests. Compared to other tasks, participants were more immersed, found the VR task more interesting, and were more motivated to participate. Reports of VR sickness symptoms were minimal, indicating no significant health or psychological risks.

Based on the findings, increasing the task difficulty is advisable. To gain more comprehensive insights, the task should be administered to a broader sample. This research provides a foundation for developing methods to measure cognitive functions in virtual reality.

### Are you currently an Early Career Researcher?

Yes, I am still a student or have not yet received my Ph.D.

**Primary author:** VIDONJA, Taja

**Co-author:** Dr KOMIDAR, Luka (University of Ljubljana)

**Presenter:** VIDONJA, Taja

**Session Classification:** Talk Session 4

**Track Classification:** Methods & Evaluation