

The Effects of Map Format, Exposure, and Sex on Simulator Sickness in Virtual Reality

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Problem Statement

While research has illustrated the benefits of head-up displays on task performance and attention to the forward field of view over head-down displays the effect of location of information in the forward field of view on simulator sickness symptoms is unknown.

Research Question

How does the location of a navigation display within the field of view affect symptoms of simulator sickness?



Hypothesis

Head-up displays may also lead to milder simulator sickness symptoms as the participants attention may be directed to the horizon.

19 Participants

- 10 males, 9 females.
- Mean age = 19.6(1.2) years.
- Recruited from Western University.
- No prior experience using VR headsets.



Methodology

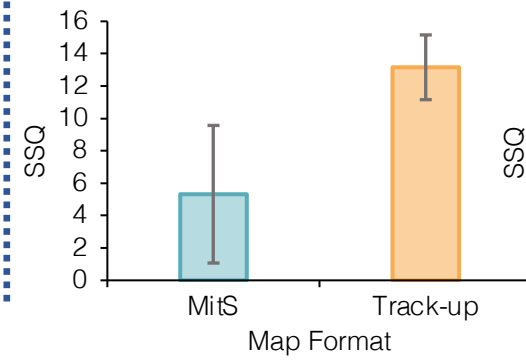
- Virtual reality navigation study.
- Two Maps: Mirror-in-the-Sky (MitS) or a track-up map.
- Followed a route to a destination.
- Completed Simulator Sickness Questionnaire (SSQ) after each trial.



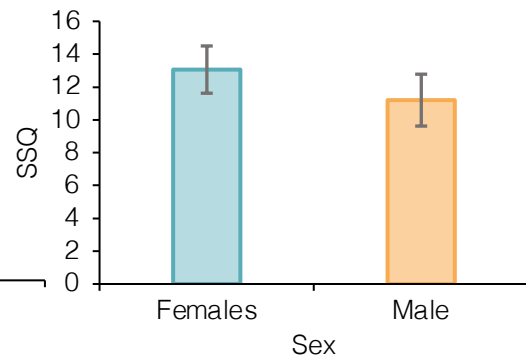
Results

- 3 (session; within) x 2 (map; between) x 2 (sex; between) mixed ANOVA.

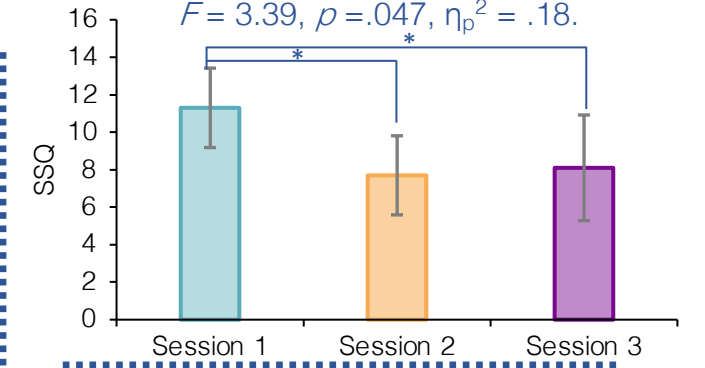
Milder symptoms for MitS
 $F = 4.91; p = .044; \eta_p^2 = .24$



Males reported fewer symptoms
 $F = 4.70; p = .046; \eta_p^2 = .24$



Symptoms decreased after the first session
 $F = 3.39, p = .047, \eta_p^2 = .18.$



Take-aways

1. The location of information within the forward field of view affects symptoms and magnitude of simulator sickness.
2. We replicated previous research findings demonstrating the effects of sex, adaptation to virtual environments across multiple sessions.



Limitations

- Alternatively, it may take longer for participants to adjust to the track-up map vs MitS.
- Additional participants needed.

