Equally moved and not really sick from viewing 2D and 3D motion stimuli on a TV screen

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Purpose and Background: Visually induced motion sickness (VIMS) and increased postural sway are two adverse effects that may occur when viewing motion stimuli. However, whether these effects are elevated to a greater extent when viewing stereoscopic 3D motion stimuli compared to 2D stimuli, has not been investigated under controlled circumstances. Therefore this study aimed at investigating VIMS and postural sway before, during and directly after viewing 2D and 3D motion stimuli, on a commonly available TV screen.

Methods: 16 Participants were exposed to an aviation documentary, containing ample scene motion in all degrees of freedom, shown in 2D and in 3D on separate occasions. Before, during, and after exposure, VIMS was assessed using a multi-symptom questionnaire and postural sway characteristics were measured using a force platform.

Results: The multi-symptom questionnaire revealed significant, but small increases in VIMS symptom severity to both 2D and 3D exposure. VIMS was not significantly more increased in case of 3D exposure compared to 2D exposure. All postural sway characteristics increased significantly as a result of exposure, but were also not differentially affected to 3D as compared to 2D exposure.

Conclusion: Viewing 3D motion stimuli did not cause more serious VIMS symptoms, compared to viewing 2D motion stimuli. We attribute this lack of difference to the fact that the 3D-effects in this documentary were optimized for cinema viewing, the projection on the TV-screen thus causing quarantining of the visual input. The overall increase in postural sway may reflect exploratory behavior, allowing the participant to gain more information about self-orientation with respect to the virtual environment.