

Leaving the Third Dimension: Cognitive Aftereffects of Stereoscopic 3D Movies

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Stereoscopic 3D is becoming an increasingly important display technology. Every year, more 3D television sets, movies and games are being marketed. At the same time, the general concern about the possible detrimental cognitive effects of exposure to 3D movies has been growing. Some 3D manufacturers are using disclaimers on their TV's and DVD's that advise people to watch 3D only for a short period of time and to avoid car driving directly after exposure to stereoscopic viewing.

However, surprisingly little experimental research has been conducted on the effects of watching a 3D movie on general cognitive functioning. Therefore, we conducted an experiment to estimate the impact of viewing a stereoscopic 3D movie on visual, spatial, and general attention performance ($N = 61$). Participants watched one out of four movies of different genres in either 2D or stereoscopic 3D. Afterwards, several tests were conducted in a randomized order. Spatial cognition was measured by using a computerized version of the mental rotation task (Shepard & Metzler, 1971), and a depth perception task (Loomis et al., 1992) in which blindfolded participants were required to estimate and walk predefined distances. Visual abilities were assessed using a visual binding task (Luck & Vogel, 1997) that requires participants to detect changes in a visual display. A verbal fluency task (Basso, Burgio, & Prandoni, 1997), a measure of attention, was used as a baseline control condition for general fatigue. A Solomon pretest/posttest design was used to control for training effects and pretest sensitization.

Our results point towards some minor aftereffects of watching a movie in stereoscopic 3D, but the size of these effects is presumably too small to impact upon daily life activities such as driving a car. The type of movie had no impact as well. Results of a current follow-up experiment on the aftereffects of stereoscopic 3D movies on visual attention with the visual search paradigm will also be presented at the conference.

References

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