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Explaining Simulator Sickness

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Abstract

Subjects who participate in driving simulation experiments often experience symptoms similar to motion sickness, called "simulator sickness." However, the exact cause of these symptoms is unknown, which makes it difficult to predict whether a subject will experience them, or to warn them of the likelihood of experiencing those symptoms. A possible relationship between motion sickness and simulator sickness has been conjectured, based on the similarity of the symptoms, but not proven. In this study, we examined whether subjects in CSU simulator experiments who reported a history of motion sickness were more likely to experience the symptoms of simulator sickness. We performed a meta-study of 6 CSU driving simulation experiments and compared subjects' reports of past experiences with motion sickness to their symptoms of simulator sickness before and after the tests. We found that the subjects who reported having experienced motion sickness in the past were more likely to experience an increase in simulator sickness symptoms during the test, and to report these symptoms to a greater degree after it was over, particularly if they reported having experienced motion sickness while being a passenger in a car or small boat, or while riding a bus. This knowledge will allow researchers to more accurately predict whether a subject is likely to experience simulator sickness during this type of experiment, and to forewarn subjects about their personal risk of experiencing those symptoms.