

Risk Awareness and Perception Training Using VR Headsets: The Validation of VR Headsets to Measure Hazard Anticipation Behaviors Dataset

Dataset available at: <https://doi.org/10.7910/DVN/F9THUH>

(This dataset supports report **Risk Awareness and Perception Training Using VR Headsets: The Validation of VR Headsets to Measure Hazard Anticipation Behaviors**, http://safersim.nads-sc.uiowa.edu/final_reports/UM%201%20Y2_Final%20Report.pdf)

This U.S. Department of Transportation-funded dataset is preserved by the SAFER-SIM University Transportation Center in the Harvard Dataverse Repository (<https://dataverse.harvard.edu/>), and is available at <https://doi.org/10.7910/DVN/F9THUH>

The related final report **Risk Awareness and Perception Training Using VR Headsets: The Validation of VR Headsets to Measure Hazard Anticipation Behaviors**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/42279>

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Title: Risk Awareness and Perception Training using VR Headsets: The Validation of VR Headsets to Measure Hazard Anticipation Behaviors

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Description: The objective of the current study is to evaluate the use of virtual reality (VR) headsets to measure driving performance for driving simulation studies and training. This is desirable because they are several orders of magnitude less expensive and, if validated, could greatly extend the powers of simulation. Out of several possible measures of performance that could be considered for evaluating VR headsets, the current study specifically examines drivers' latent hazard anticipation behavior both because it has been linked to crashes and because it has been shown to be significantly poorer in young drivers compared to their experienced counterparts in traditional driving simulators and in open road studies. The total time middle-

aged drivers spend glancing at a latent hazard and the average duration of each glance were also compared to these same times for younger drivers using a VR headset and fixed-base driving simulator. In a between-subjects design, 48 participants were equally and randomly assigned to one of four experimental conditions: two young driver cohorts (18-21 years) and two middle-aged driver cohorts (30-55 years) navigating either a fixed-base driving simulator or a VR-headset-based simulator. All participants navigated six unique scenarios while their eyes were continually tracked. The proportion of latent hazards anticipated by participants, which constituted the primary dependent measure, was found to be greater for middle-aged drivers than for young drivers across both platforms. Results also indicate that the middle-aged participants glanced longer than their younger counterparts on both platforms at latent hazards, as measured by the total glance duration; however, there was no difference when measured by the average glance duration. Moreover, the magnitude of the difference between middle-aged and younger drivers was the same across the two platforms. The study provides some justification for the use of VR headsets as a way of understanding drivers' hazard anticipation behavior and using this understanding to create a risk awareness training program.

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Dataset description:

This dataset contains 1 .zip file collection described below.

TrainingBehaviors_VR.zip:

This collection contains five .xlsx files titled:

- Demographics and Post-Study Questionnaire.xlsx
- Driver Behavior Questionnaire.xlsx
- Glance Duration.xlsx
- Hazard Anticipation Scores.xlsx
- Simulator Sickness Questionnaire.xlsx

The .xlsx file is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine

National Transportation Library (NTL) Curation Note:

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://ntl.bts.gov/public-access>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at <https://doi.org/10.7910/DVN/F9THUH> on 2019-09-04. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.