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## Comparison of immersive and non-immersive driving task environments

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To provide reliable and valid findings while prospective evaluations in the automotive context highly realistic driving environments are recommended. Nowadays, in-car devices are mainly evaluated with driving simulator experiments followed by real car driving studies. Driving simulators are characterized by high internal validity but lack regarding ecological validity. Real car driving experiments are ecologically valid but difficult to standardize, more time consuming and expensive. One economizing suggestion is to implement more immersive driving environment when applying driving simulator experiments. This paper discusses research investigating the influence of immersive and non-immersive experimental set ups while performing the Lane Change Task (LCT; ISO, 2008). The task consists of a sequence of lane change maneuvers while driving with a fixed speed of 60 km/h on a three-lane road. Hereby, the immersive mode of visualization (Oculus Rift®) was characterized by stereoscopic 3D view, stereo car sound, 360° head tracking and approximately 100° field of view. The non-immersive mode of visualization (Laptop) was characterized by 2D view, stereo car sound, no head tracking and a 75° field of view. Twenty participants took part in the comparative study. Subjective data show advantages regarding presence experience when performing the LCT with the Oculus Rift® but affect adversely cognitive workload, situation awareness and simulator sickness compared to a non-immersive PC set up. To sum up, findings of the comparative study lead us to conclude that immersive driving environments are useful to ensure a more realistic impression of the situation but need to be improved regarding technical issues.

### Biography

Diana Reich has completed her Bachelor's degree in Psychology at the TU Chemnitz and her Master's degree in Human Factors at the TU Berlin in Germany. She has received a Doctoral scholarship from the DFG and is part of the research training group "Prometei". Because of her supervisor, she is also related to the TU Berlin and Fraunhofer IPK, where she is working as a team member on the Digital Cube Test Center (DCTC).

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