Truck drivers’ turning information concept – a psychological approach

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Human factors’ approach

- **Drivers’ task**
  - steer and control with available information
  - primarily visual (ANDERSEN, 2011)
  - many decisions in short time span

- Humans make decisions very fast under uncertainty
  - by available information
  - by representative information (memory involvement) (TVERSKY & KAHNEMAN, 1974)
Truck driving – the visual field

Driver’s head and view turns in the direction of driving!
Turning information concept

→ No accident prone situation
Turning information concept

→ Driving straight ahead, blind spot detection
Turning information concept

→ Driving straight ahead, preparing turning, (direction indicator maybe activated)
Turning information concept

→ Begin turning, direction indicator **maybe** activated,
→ gaze perhaps into mirror’s direction
Turning information concept

1. Support drivers with information!
2. Make perception possible!
4. Notice recommendations of design! (e.g. EN ISO 9241 [110])
5. Take situational aspects into account! (POWELLEIT ET AL., 2015)
   (e.g. accident prone situations)
What do we need?

We need a recognizable and interference-free information concept!
Video (eye tracking)
How to avoid disturbance?

- No use of warnings in an early detection phase!

- Use of information!

- Well-balanced flashing (Baldwin & Lewis, 2013)

- 30° (around fixation) is most important for vehicle control! (Lachenmayr, 2006)
Turning information concept

The balance between recognizable and interference-free is the key!

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• ...using the periphery
• ...using human’s gaze movement

Display blind spot information!
Turning information concept

- Display blind-spot information!
  - Stamp out the blind spot!
  - Familiar for drivers (car experience)
  - Drivers expect backward information next to mirrors
  - **Benefit of 23%** regarding injury crashes (CICCHINO, 2017)
Conclusions

- Not disturbing (robustness in case of false positives)!
- Well informing (in use case)!
  - Perception increases when gaze turned!
- Information location (e.g. at A-pillar) equivalent with hazard location!
  - Information is at the right place at the right time!
- Use of mirrors is encouraged!
- Overall: Good support in complex situations!
Thank you for your attention!

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References

- ANDERSEN, G. J. (2011): Sensory and perceptual factors in the design of driving simulation displays. In: D. L. FISHER; M. RIZZO; J. K. CAIRD; J. D. LEE (Eds.): Handbook of Driving Simulation for Engineering, Medicine, and Psychology (pp. 8-1-8-11). Boca Raton, FL: CRC Press
- EN ISO 9241 [110]