Drivers‘ task management of their in-vehicle activities

Markus Schumacher

Federal Highway Research Institute (BASt)

Germany

Bundesanstalt für Straßenwesen

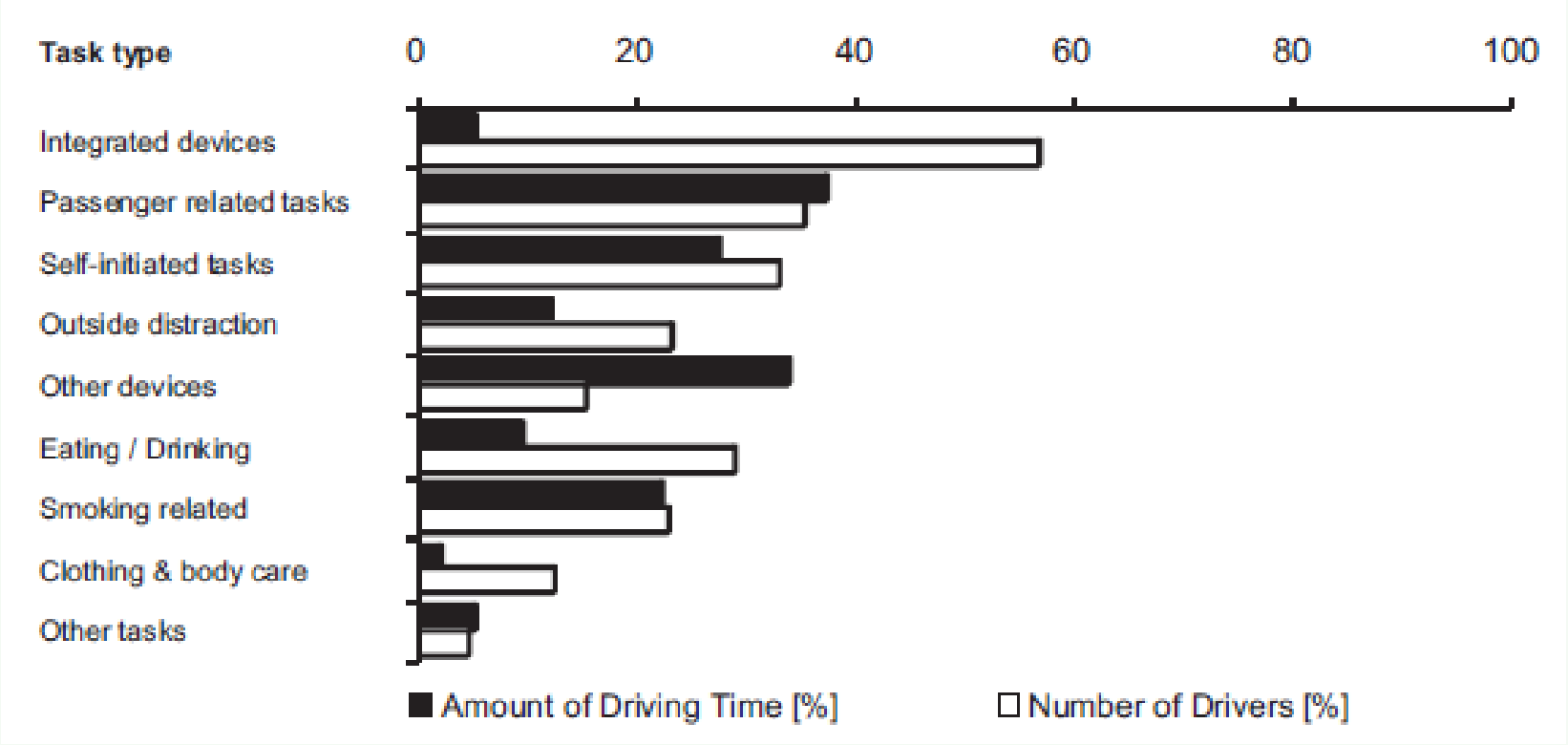
Outline

- What are drivers doing while driving?
- Are drivers able to adjust their secondary task engagement to traffic conditions?
- Which countermeasures are promising to enhance road safety?

Prevalence of distracting activities
(Huemer & Vollrath, 2011)

- 289 drivers
- Face-to-face interviews
- Braunschweig (Germany)
  - Motorway service areas
  - City
- Assessment of
  - Frequency
  - Duration
  - Subjective risk

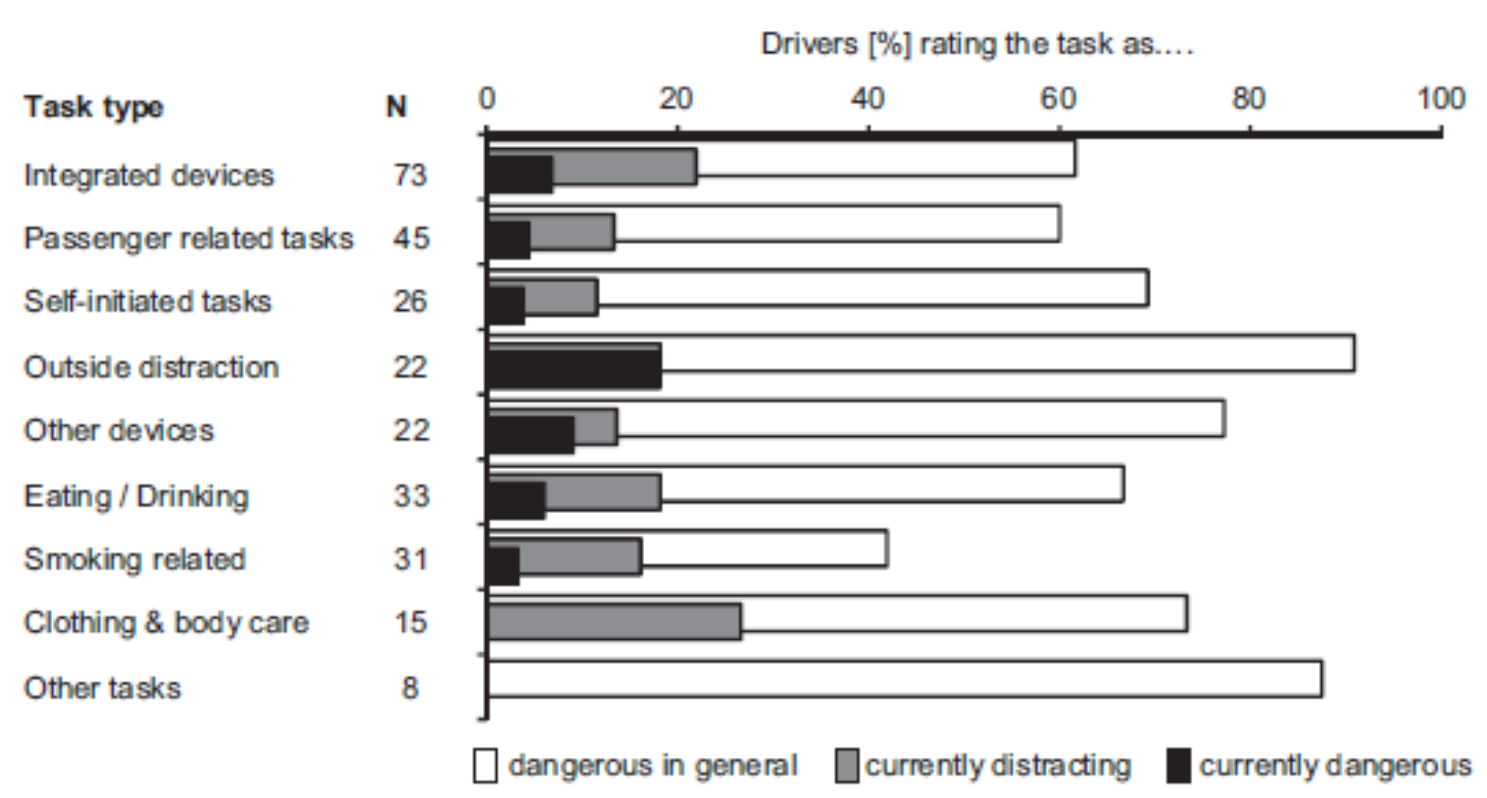
Prevalence of distracting activities



(Huemer & Vollrath, 2011, p. 1708)

- Tasks differ in terms of frequency and duration
- A ban is not suitable for all distracting tasks

Subjective estimation of risk

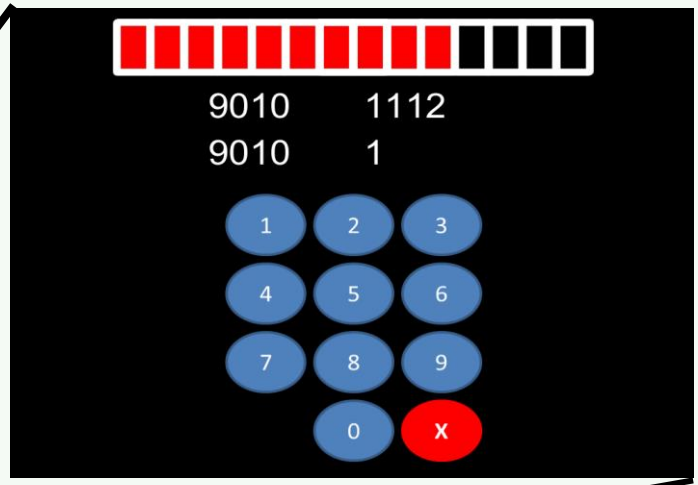


(Huemer & Vollrath, 2011, p. 1710)

- Most tasks are rated potentially dangerous
- No endangerment in the specific situation

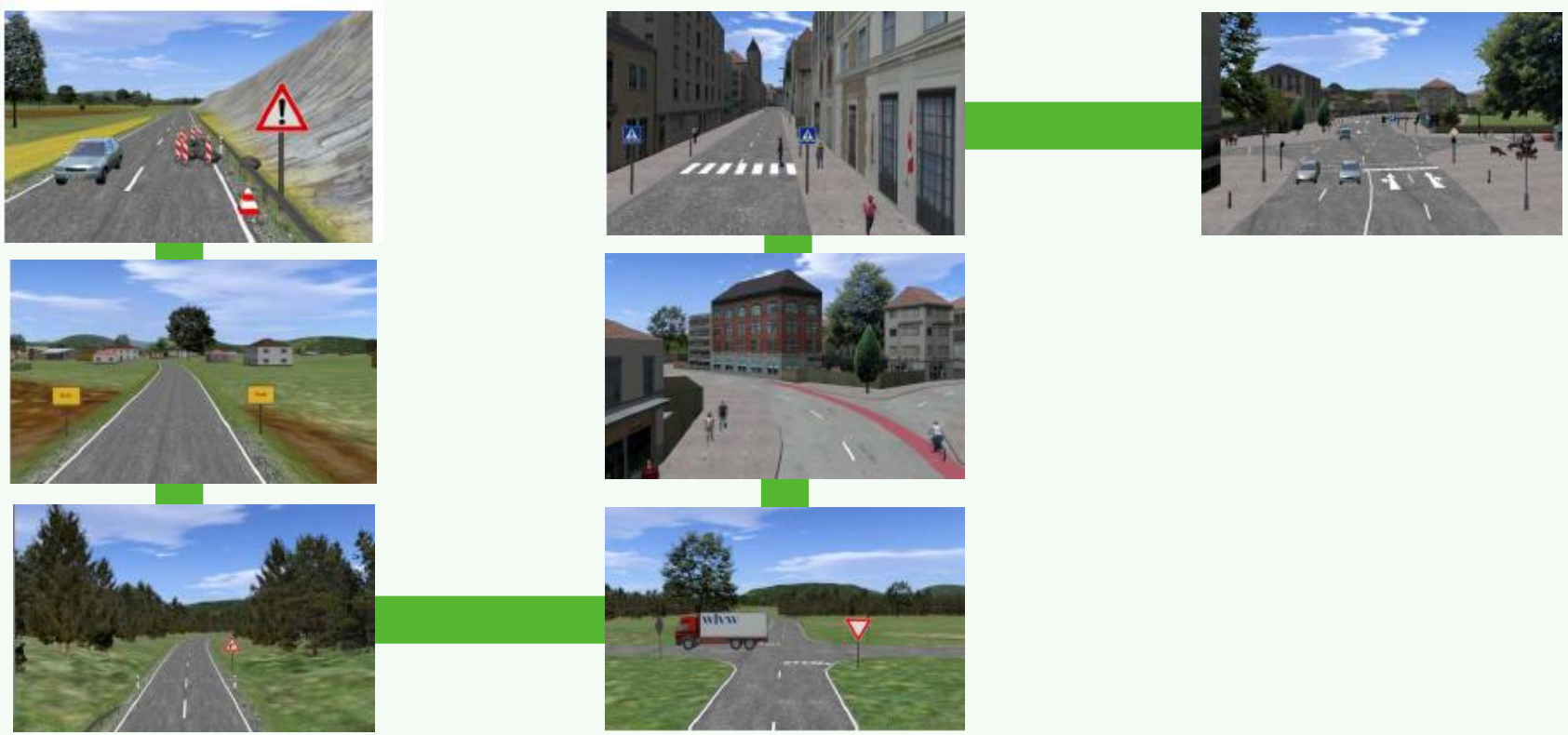
Simulator study: Drivers‘ task management

Secondary task



BASt Driving Simulator

Track and conditions



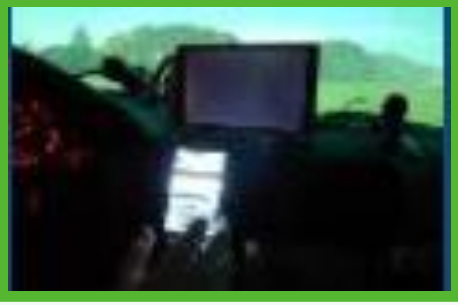
- Group 1: **had to** do the secondary task (time pressure)
- Group 2: **could** do the secondary task (self-paced)
- Group 3: **no distracting task** (control group)

Results

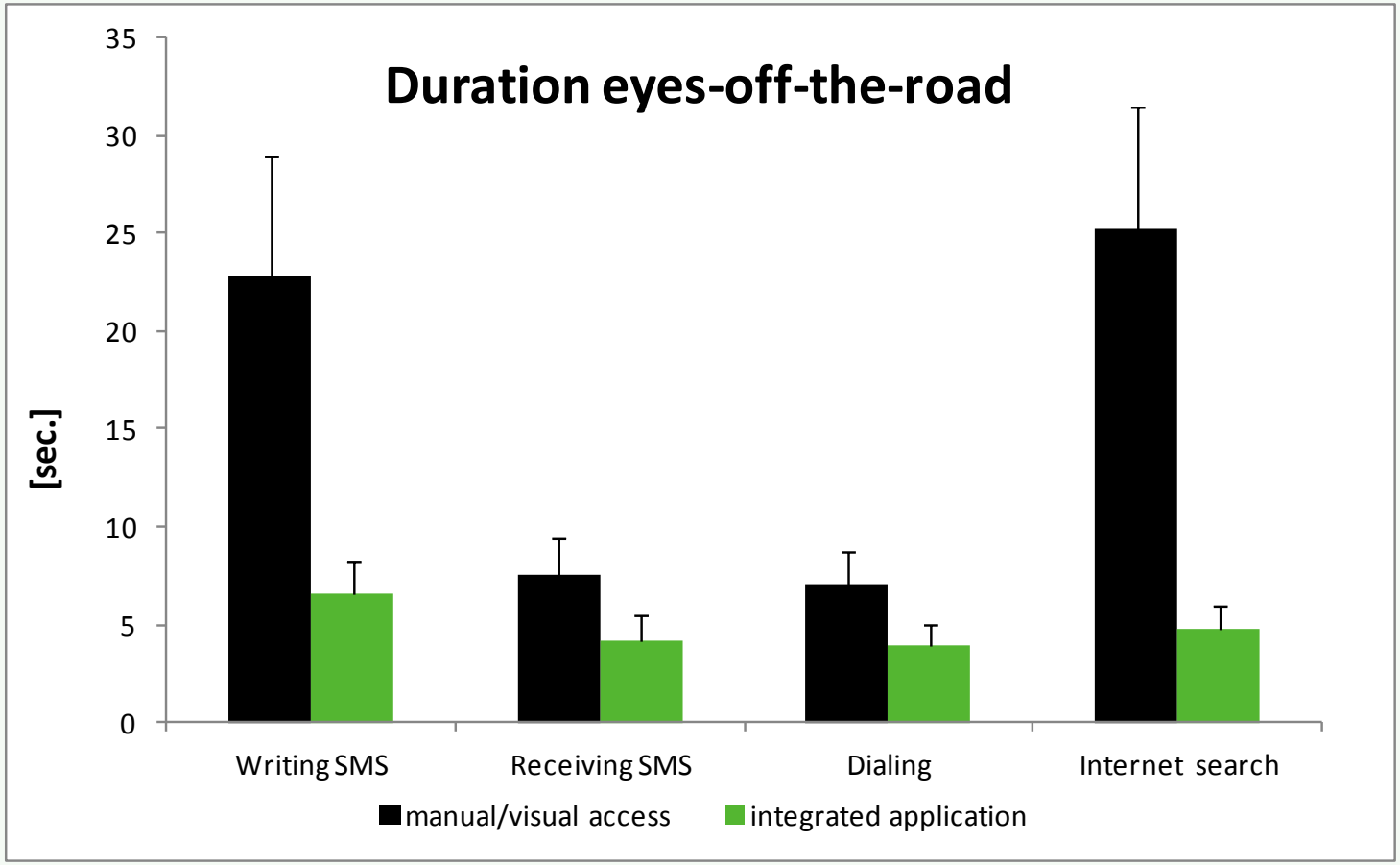
- **If task management was not possible**
  - SDLP increased
  - Varying time headway
  - Prolongued brake reaction time
  - Driving errors

- **If task management was possible**
  - Secondary task engangement in critical traffic situations was reduced
  - SDLP, time headway & brake reaction time was comparable to driving without distraction

Simulator study: Distracting potential of smart phone use

manual / visual access	speech access
	
Writing SMS	Speech-to-text
Reading SMS	Text-to-speech
Dialing a number	Speech-to-text
Searching the internet	Internet access restricted

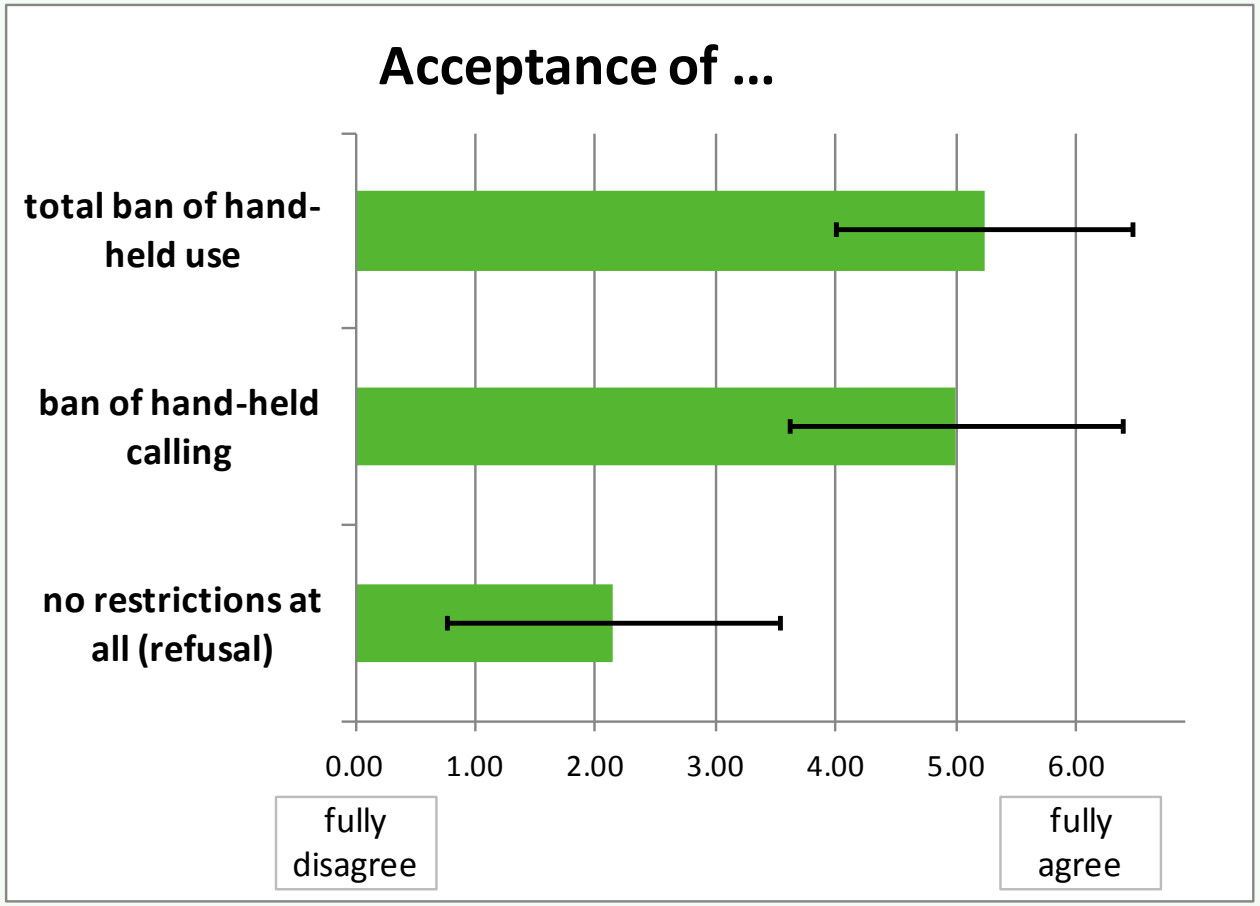
Preliminary results (1)



N = 48

Integrated systems: eyes-off-the-road time reduced

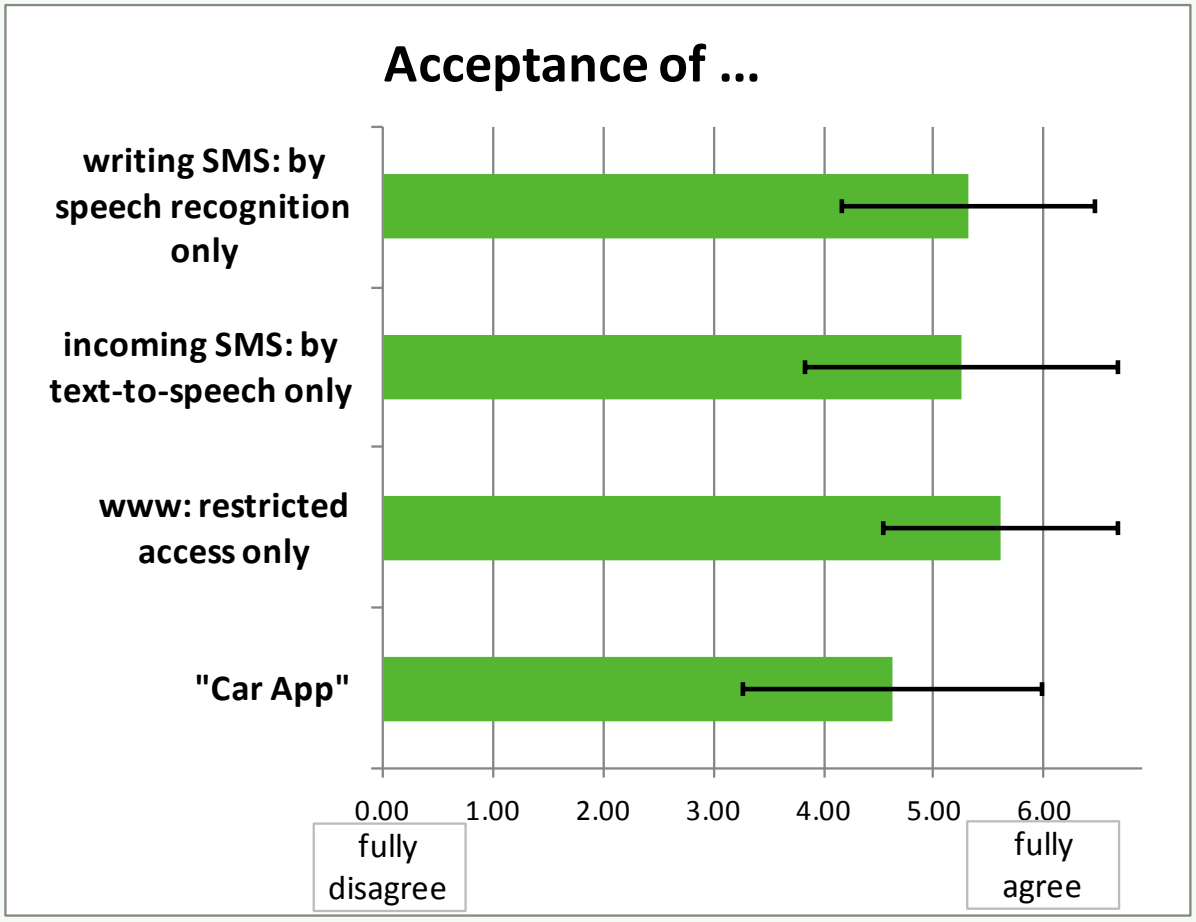
Preliminary results (2)



N = 48

High acceptance of restrictions on cell phone use while driving

Preliminary results (3)



N = 48

High acceptance of integrated systems

Conclusions

- Drivers are engaged in secondary activities
- Ban is not suitable for all distracting activities
- Drivers are aware of the risks associated with distracting activities
- Drivers are able to adjust their engagement in distracting activities to the requirements of different traffic situations
- Technical solution instead of ban of mobile phone use
- More research on limits of drivers' resource allocation strategies

Thank you for your attention!

Markus Schumacher
Federal Highway Research Institute (BAST)
Germany
schumacher@bast.de