



Emotion in Motion

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DDI – Gothenburg, Sept 2011



Agenda

1 Why simulation?

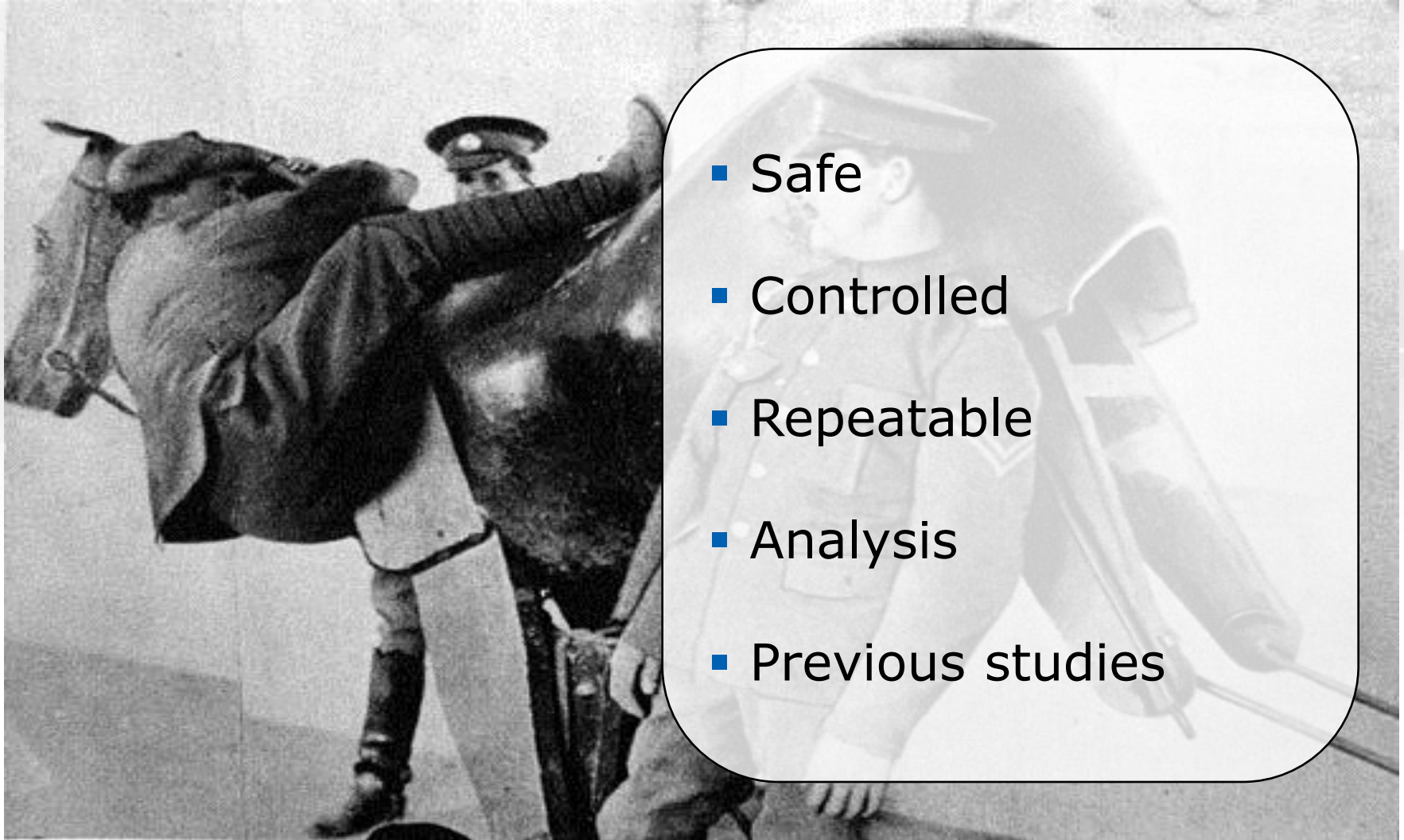
2 Tests

3 Driver 'perturbations'

4 Results

5 Implications

Why simulation?



- Safe
- Controlled
- Repeatable
- Analysis
- Previous studies

TRL DigiCar



Test conditions

- Repeated measures crossover design
- Baseline control drive
- Participants from TRL database
- Car following
- Highway
- Curve following
- Reaction time tests
- Completed in around 12 minutes

Car following



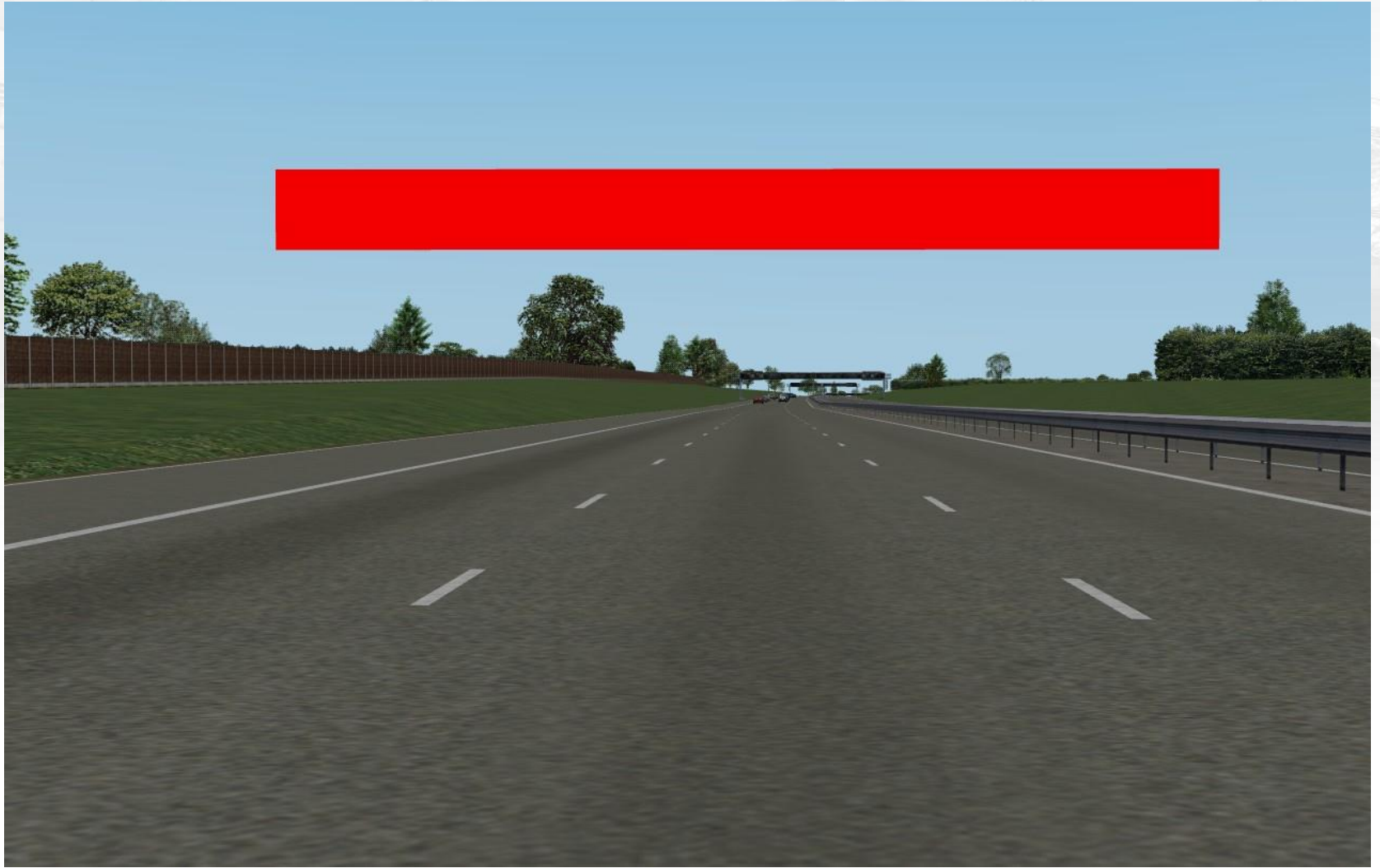
Highway



Curve following



Reaction time stimulus



Study 1 – Auditory distraction

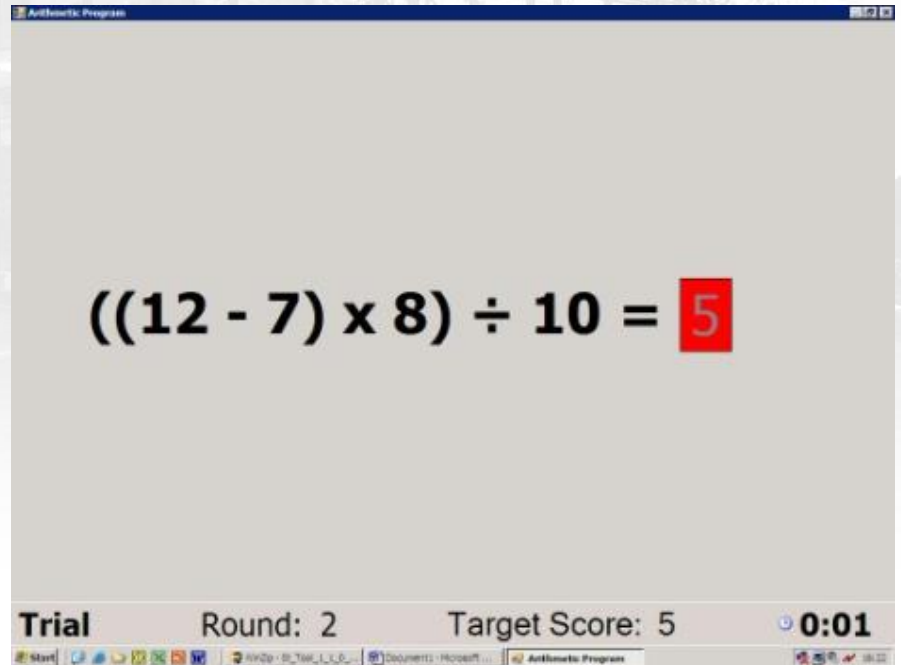
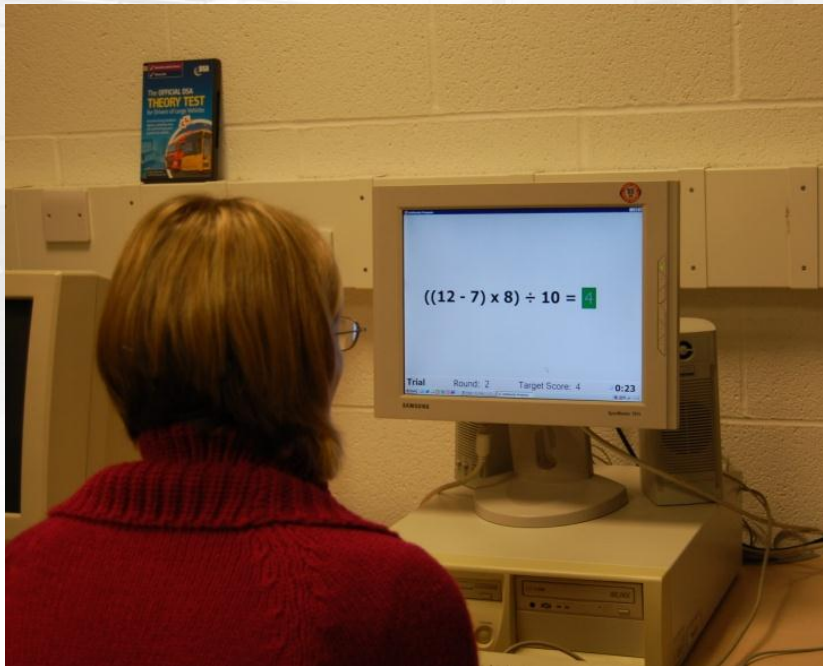
- N = 18; 9M/9F; age 25-45
- Arguing kids
 - Auditory track of arguing children played during drive
 - One child repeatedly utters 'No!'
 - Participant required to count number of times 'No' is uttered
- Sports commentary
 - Commentary track from three Australian horse races
 - Participants made a sham bet in each race

Study 2 – Relaxation state – relaxed state

- N = 18; 9M/9F; age 25-45



Study 2 – Relaxation state – stressed state

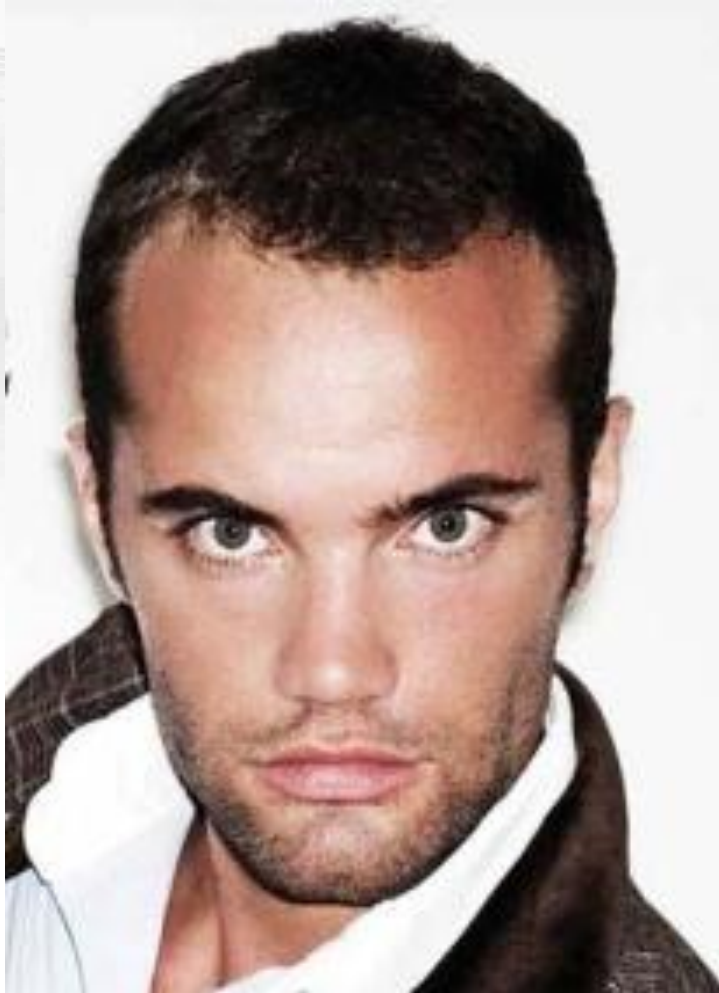


- SACL questionnaire confirmed significant stress effects

Study 3 – Music

- N = 18; 9M/9F; age 25-45
- Preferred music
 - Participant selected four favourite 'upbeat' songs
- Non-preferred music
 - Participant selected four songs that they really disliked
 - Or
 - Selected genre of music that they strongly disliked
 - Selected artist that they strongly disliked

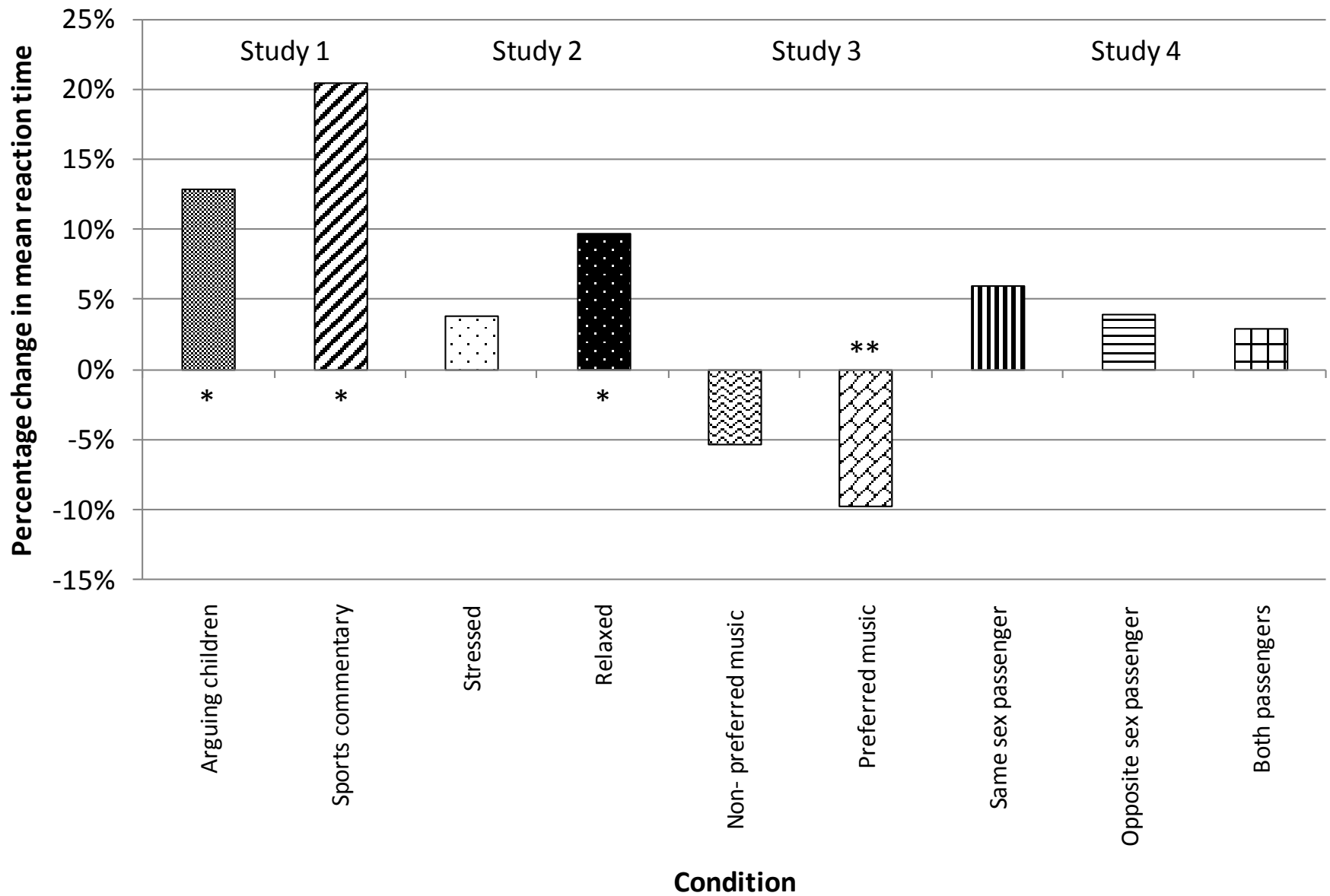
Study 4 – Passengers – James & Holly



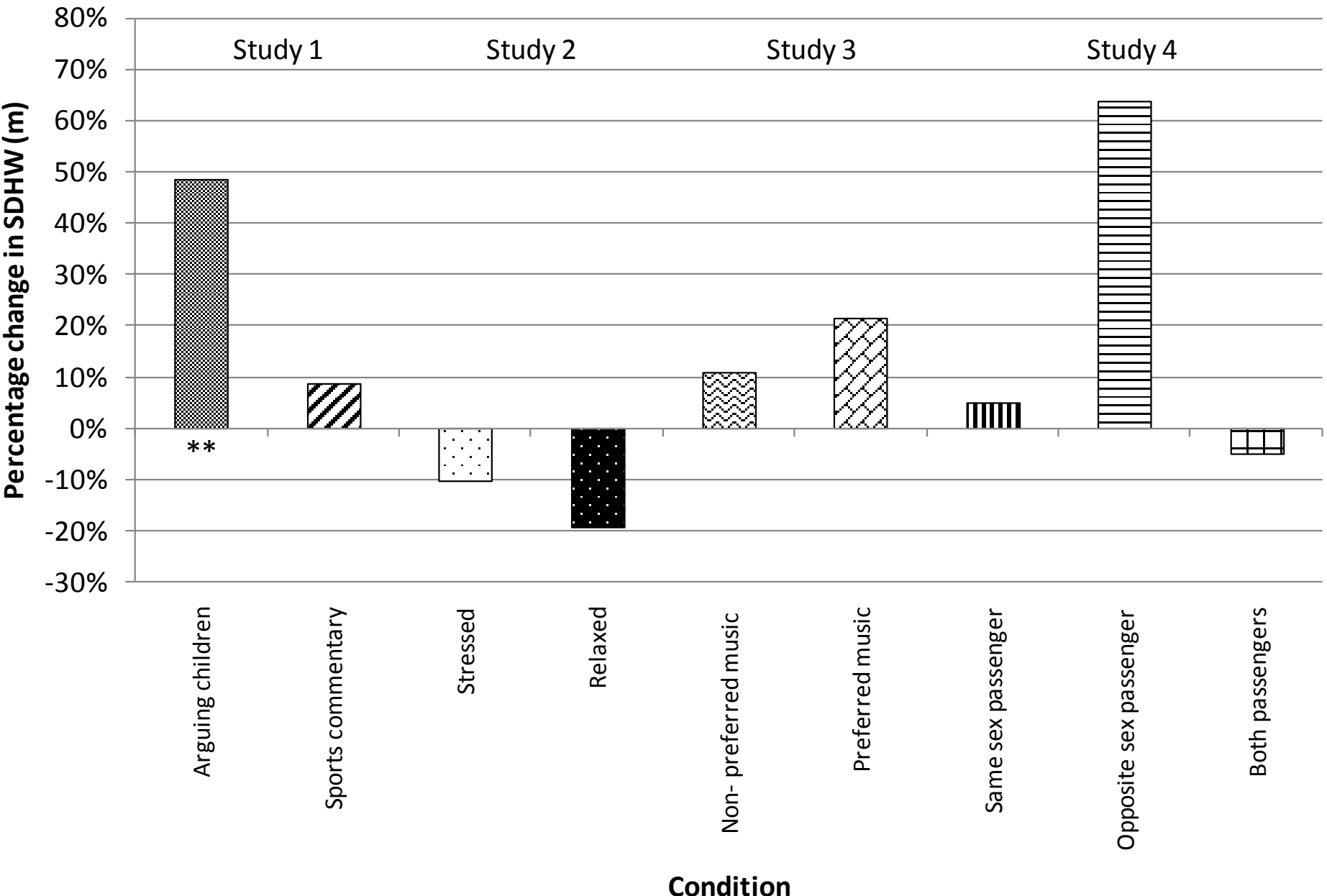
Study 4 – Passengers

- N = 20; 10M/10F; age 17-24
- Conditions
 - M passenger
 - F passenger
 - M+F passenger
- Passenger(s) engaged with participant throughout drive

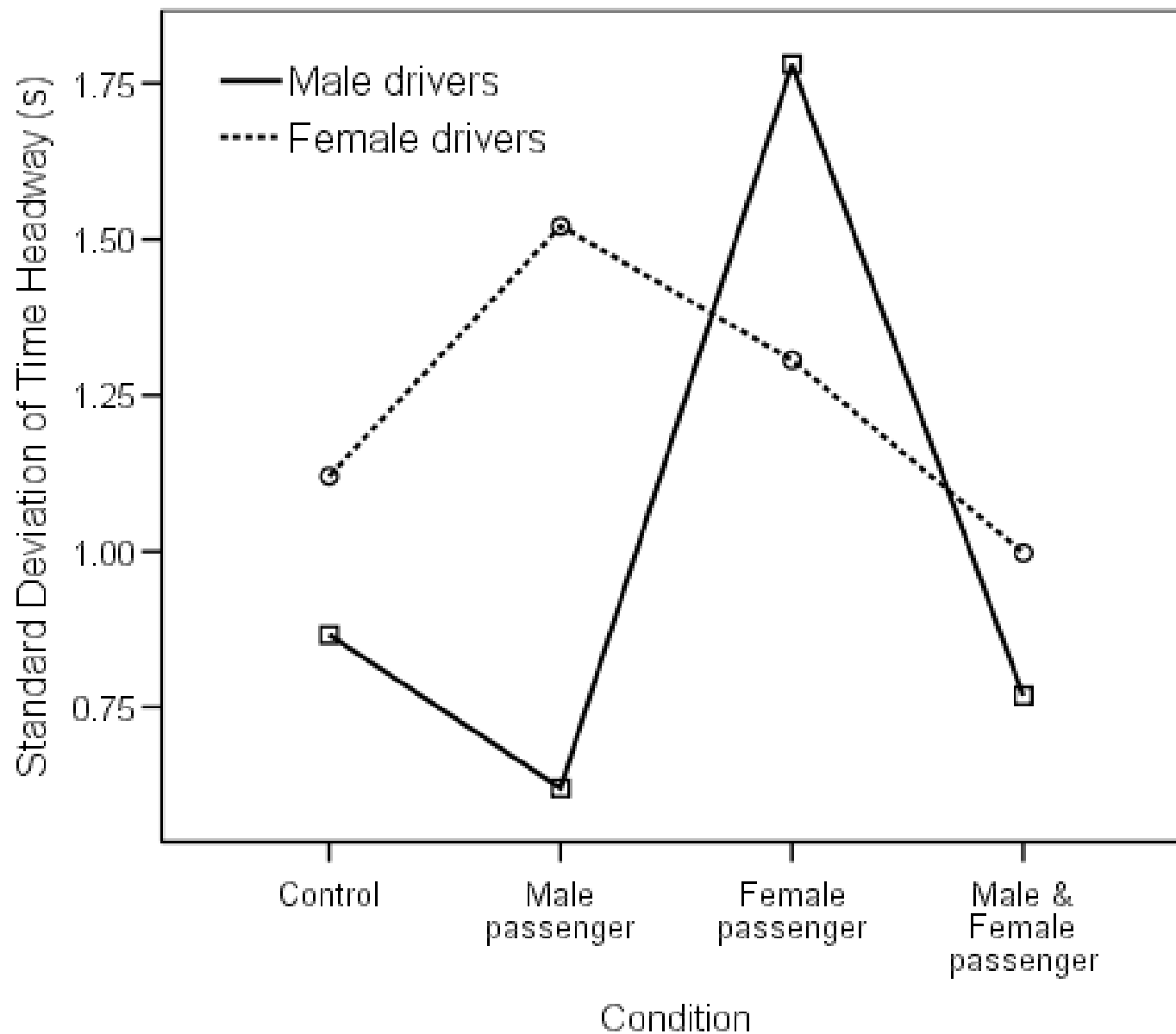
Results – Reaction times



Results – Variation in time headway



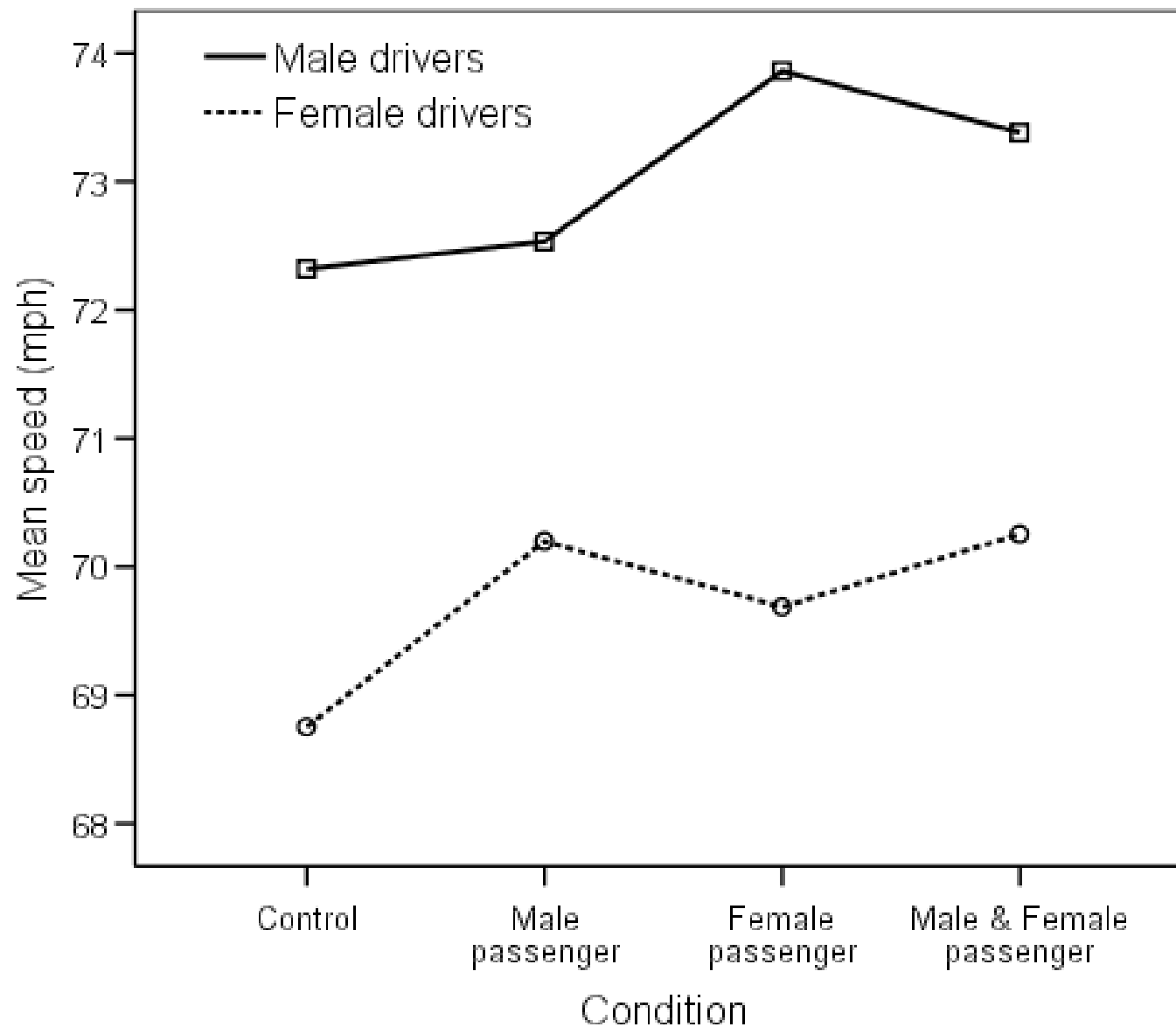
Study 4 – Variation in time headway



Speed

- Study 1: Drivers significantly slower in curve following when listening to sports commentary cf control and arguing children ($p < 0.05$ in each case)
- Study 2: Drivers significantly faster on motorway in stressed cf relaxed state ($p = 0.016$)
- Study 3: Tendency to drive faster with music (NS)

Study 4 - Speed



Study 4 – Speed – additional result

- Also took NEO-PI R personality measures
- Modesty facet (Agreeableness domain)
- Strong significant –ve correlation with speed
 - Only present when carrying passengers (either gender)

Implications

- Driving tasks sensitive to a range of competing stimuli
- All studies constrained
- Detecting driver/vehicle state – increased vehicle automation

Implications

- Highly desirable to develop standardised simulator impairment test(s)
 - Hardware
 - Scenarios
 - Data analyses
 - Participant demographics
 - ...
- Or do we use naturalistic driving data?



**Any
Questions?**

Emotion in Motion

Driver Distraction & Inattention conference
Gothenburg, Sweden – Sept 2011

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