

**YOUNG DRIVER  
FOCUS 2019**

# **CREATING SAFER YOUNG DRIVERS**

**TRAINING, INTERVENTIONS & AN INTERNATIONAL PERSPECTIVE**

IN ASSOCIATION WITH

**ingenie**

ORGANISED BY

Road Safety GB

FIRST  
CAR

RAC  
Foundation



# Making hazard perception testing more realistic: The first steps towards VRHP



NOTTINGHAM  
TRENT UNIVERSITY 



Driver & Vehicle  
Standards  
Agency

JELLY LEARN



2002



2022?

# The reported advantages of VR

- Immersion - “The higher the immersion, the better the training and learning environment,”

Vinay Narayan, Executive Director, HTC Vive

# Examples of current VR training



UPS (2018) – VR hazard training for delivery drivers



“The world’s first VR Driving School”



VR Motion

# But is the hype justified?

- Weidner (2017) – Lane changing was similar in 2D or VR. No benefit but greater sickness in VR
- Other studies have found increased sickness (Aykent et al., 2016; Forster et al., 2015)



# The Research Project

- 24 months
- Develop 360° hazard tests and training tools
- Assess their benefits compared to traditional testing and training tools



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# The first steps

We developed two types of hazard test:  
Hazard perception vs. hazard prediction

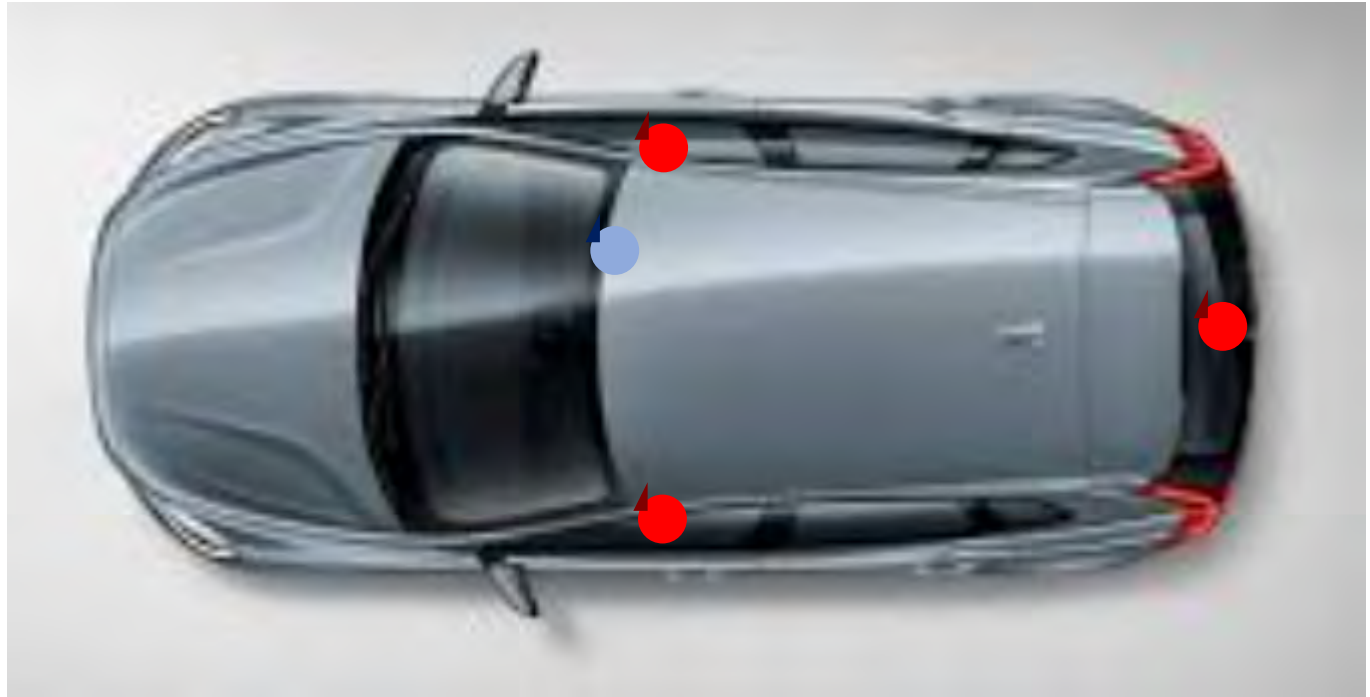
Specific Qs:

- Will Hazard Prediction clips cause more sickness?
- Will older participants be more susceptible to sickness?



# Creating the 360 clips

- 360° camera
- HD mini cameras



# Creating the 360 clips



# Creating the 360 clips



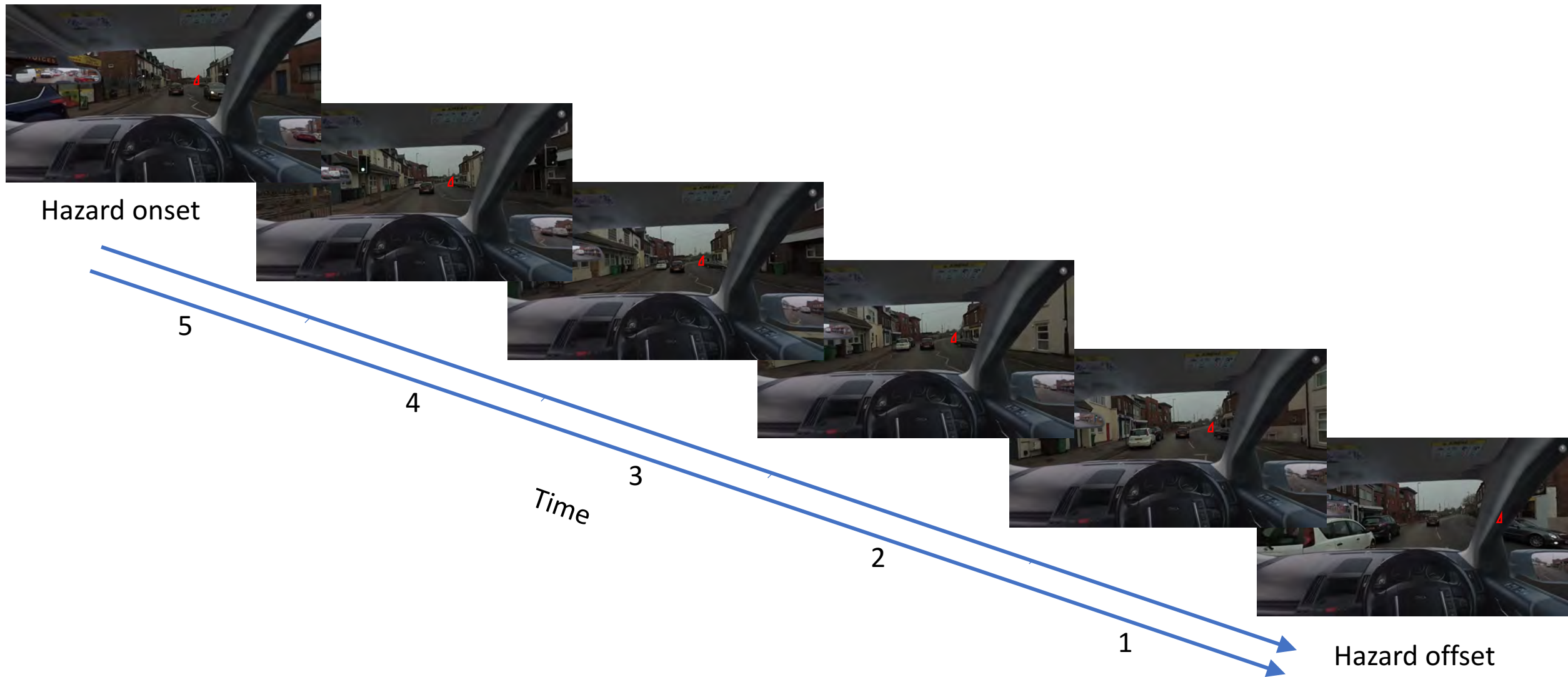
# Creating the 360 clips



# Creating the 360 clips



# Hazard Perception (HP) – 12 clips



# Hazard Prediction (What happens next?) – 12 clips



What happens next?

What happens next?

1). A car reverses out of the side road on the right.

2). The car ahead brakes suddenly.

3). A parked car on the left pulls off in front of you.

4). The driver's door of the parked car ahead opens.

Time

# Participants

	18-25	26-35	36-45	45-55	55+
Tested N	23	12	13	11	18
N after losses	21 <sup>1,2</sup>	12	13	9 <sup>1</sup>	17 <sup>1</sup>

<sup>1</sup> Four participants withdrew due to sickness (5.6%)

<sup>2</sup> One participant was removed due to data loss



# Measures - Simulator sickness

Please provide your levels of discomfort below:

	None	Slight	Moderate	Severe
General discomfort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fatigue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Headache	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eyestrain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty focusing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Salivation increased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sweating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nausea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty concentrating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
"Fullness of the head"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blurred vision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dizziness eyes open	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dizziness eyes closed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vertigo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stomach awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

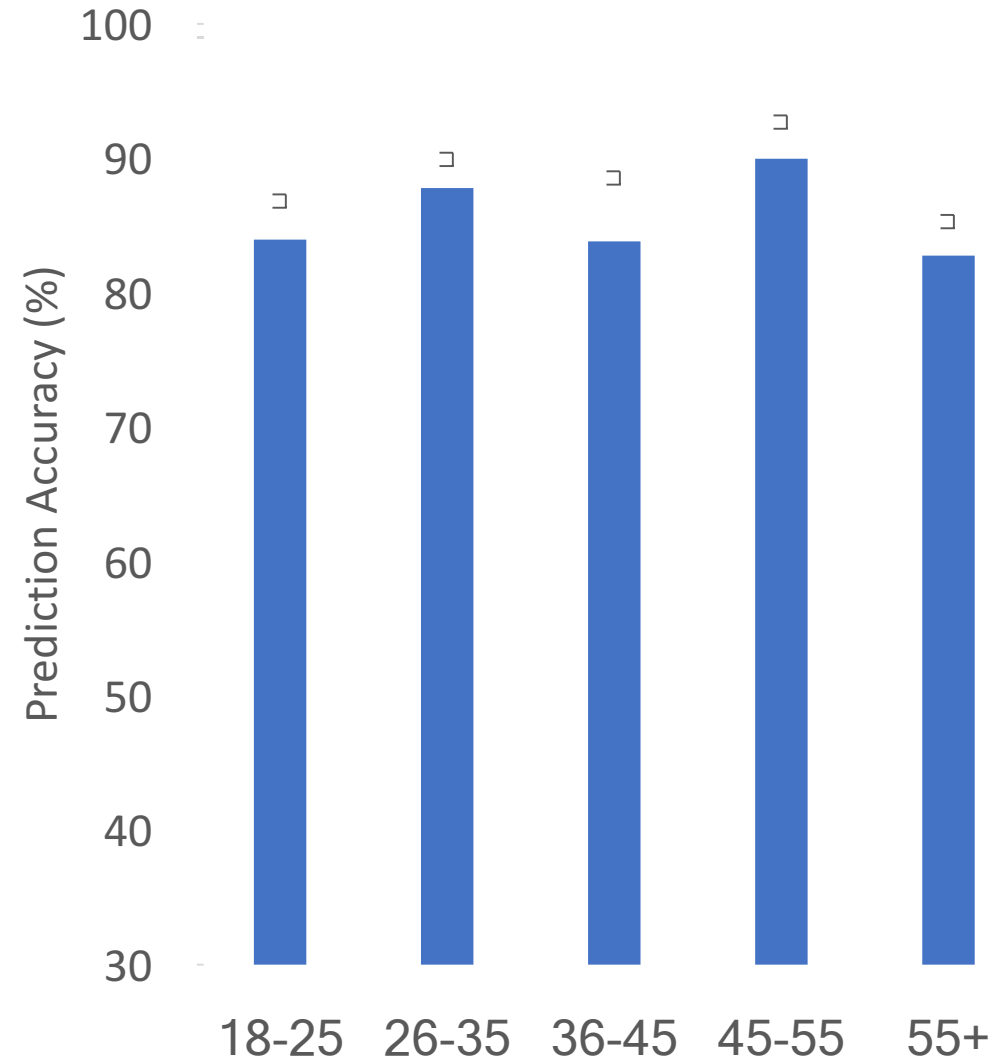
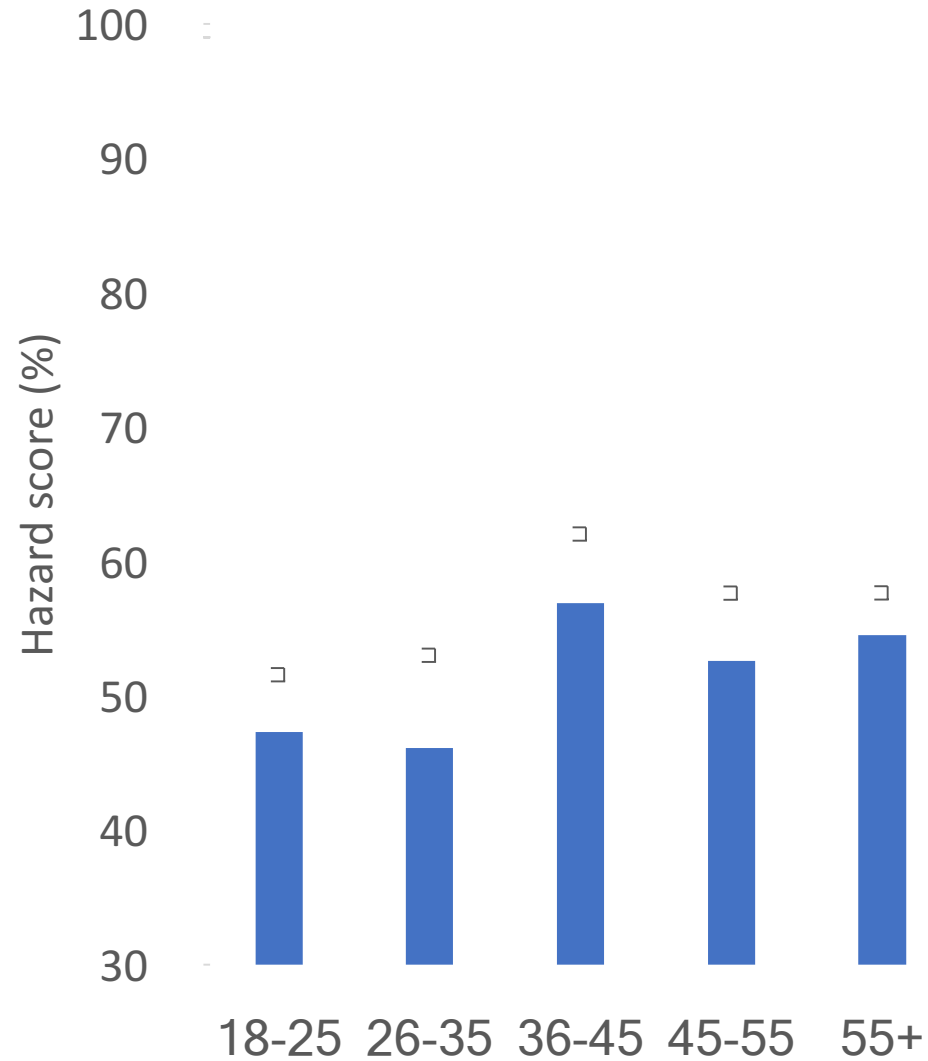
- 16 item sickness scale
- How **Comfortable?**
- How **Realistic?**
- How **Immersive?**
- How **Engaging?**

# Procedure

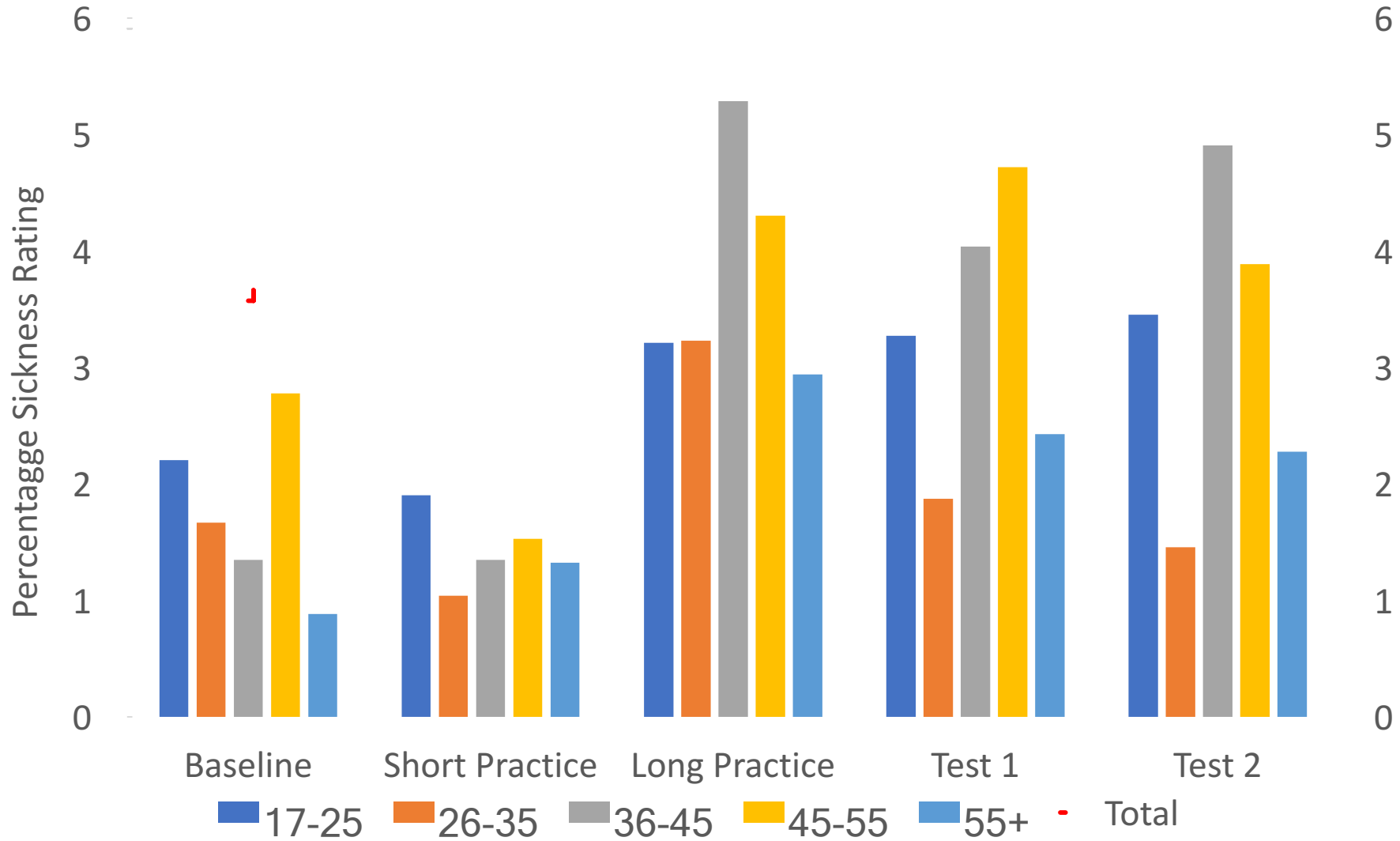
- Demographics
- Sickness Q1 (Baseline)
- Short practice (40 sec)
- Sickness Q2
- Long practice (2 mins 13 sec)
- Sickness Q3
- Hazard test 1
- Sickness Q4 / CRIE
- Hazard test 2
- Sickness Q5 / CRIE



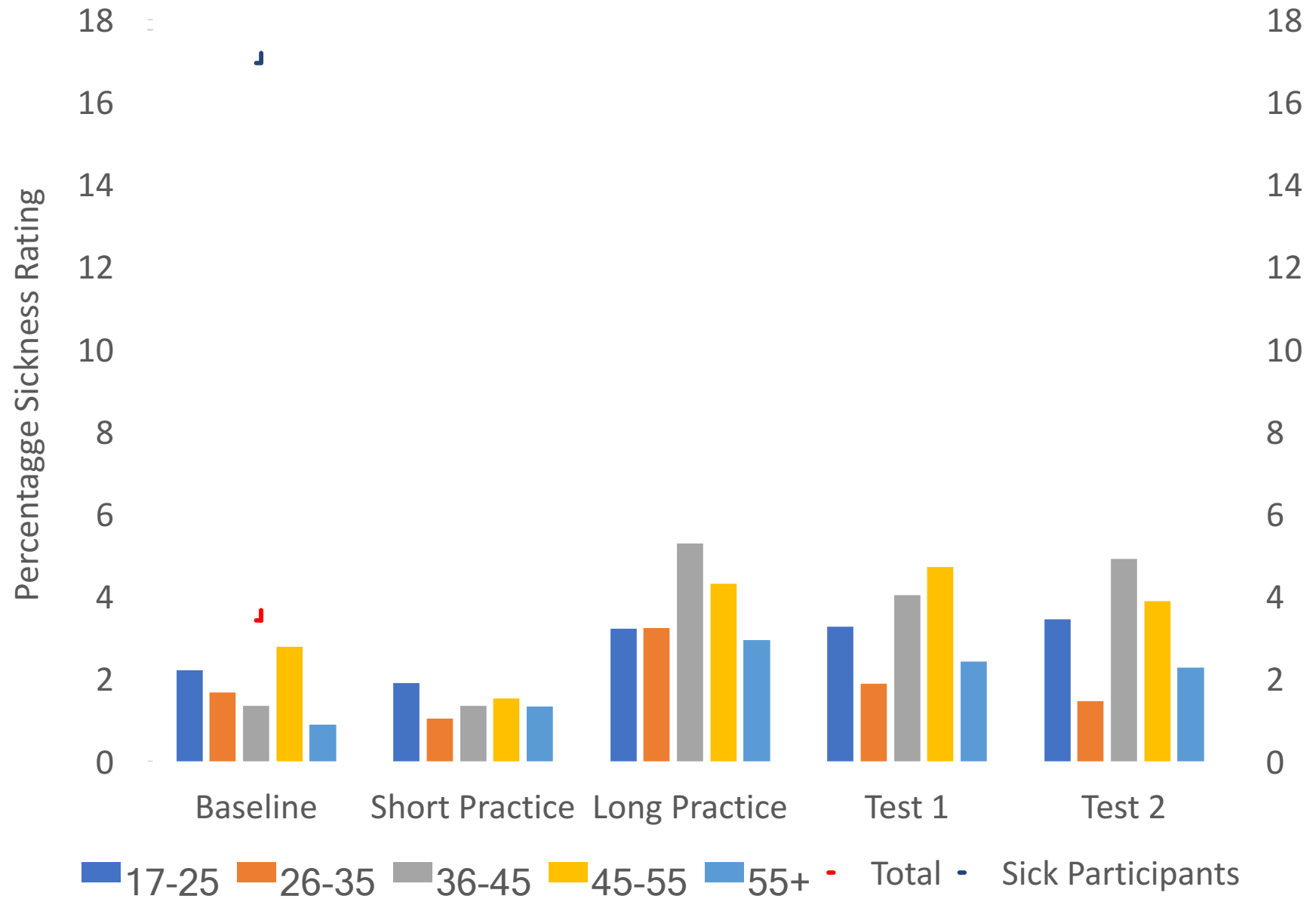
# Behavioural performance



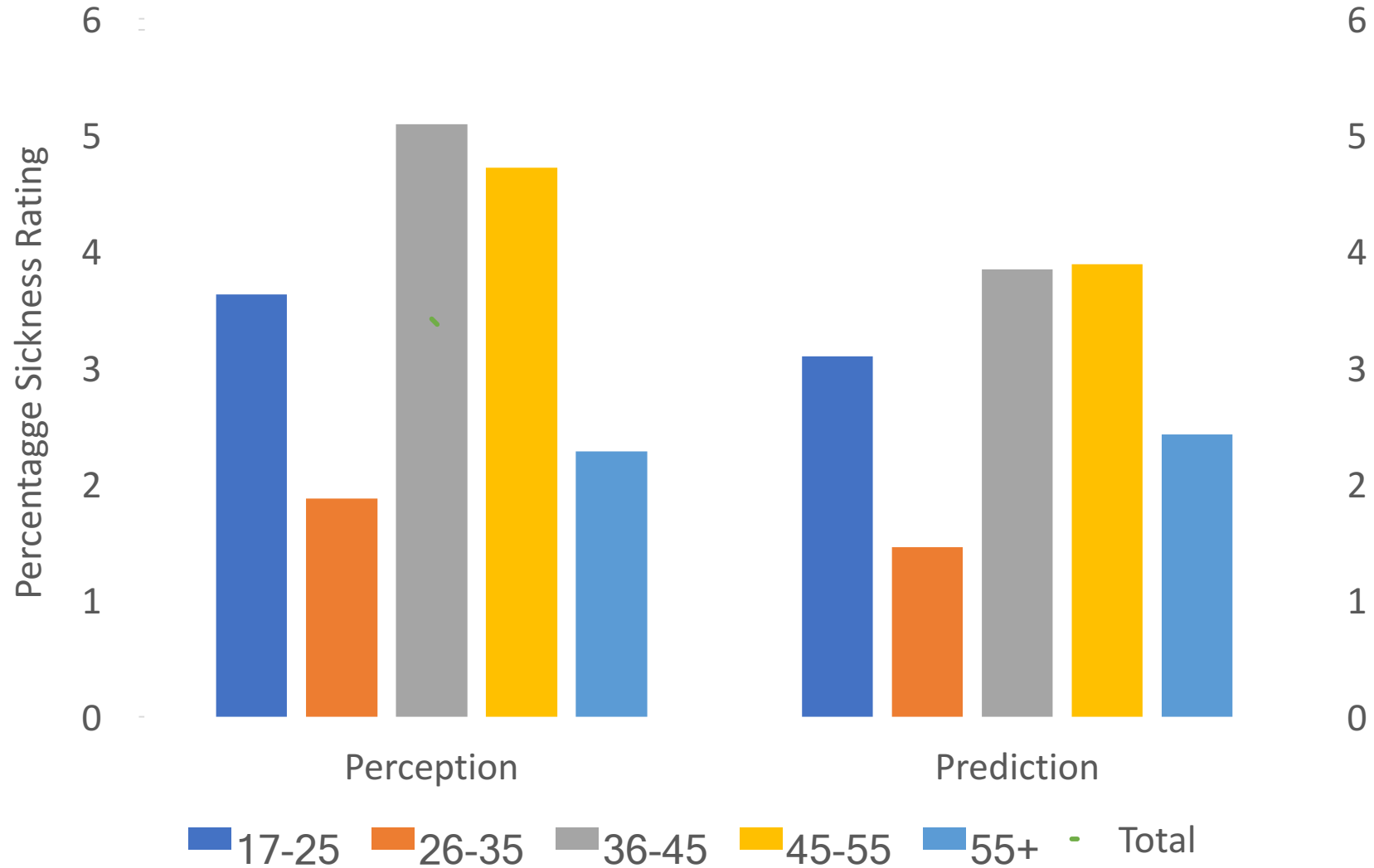
# Sickness Scores



# Sickness Scores



# Sickness Scores



- How **C**omfortable? PREDICTION > PERCEPTION ( $p < .05$ )
- How **R**ealistic? No effect of test type
- How **I**mmersive? No effect of test type
- How **E**ngaged? PREDICTION > PERCEPTION ( $p < .005$ )

# Conclusions

- Severe sickness rates were lower than expected (5.6%)
- A long practice (>2 mins) can identify sickness
- Sickness appears unaffected by age
- Our Hazard Prediction test does not create more sickness than the Hazard Perception test
- But performance on the prediction test is too good!



# What next?

- Film more clips for a 360 Hazard Prediction test
- Compare 360 and single-screen tests
- Develop CGI clips

Any questions?



@CrundallProf @ntuTRiP



Transport Research in Psychology (TRiP)



TestMyDriving.com