

WHEN YOU CROSS THE ROAD DEPENDS ON CAR DESIGN AND SIZE

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34th Workshop of the International School of Ethology, Erice, Sicily, Italy, 17th - 22nd June 2015



RESEARCH QUESTIONS

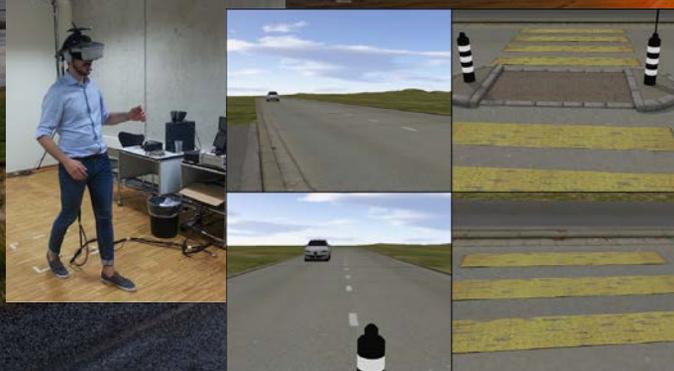
- Does car design have a bearing on the behaviour of pedestrians?
- Is the minimum accepted distance when crossing the street bigger for cars with dominant appearance than for cars with friendly appearance?
- Is the speed of dominant cars overestimated compared to friendly cars?

INTRODUCTION

- Sensitivity for facial features even in non-human and inanimate objects, such as cars¹⁾
- Both car fronts and human faces lead to comparable N170 amplitudes in EEG^{2) 3) 4)} and similar activation of the fusiform face area⁵⁾
- Car fronts elicit attributions of emotions, personality traits and attitudes¹⁾

METHOD

- Virtual reality (VR) environment with a road and a zebra crossing with centre island
- Head-mounted display
- 4 cars with high power design, 4 cars with low power design, chosen from Windhager et al. (2008)¹⁾
- Vehicles passing by individually



Block 1: Crossing time

- Cars passed by with a speed of 50 km/h without stopping
- Participant's task: Cross the road at the latest moment (starting position: Pavement or centre island)

Block 2: Speed estimations

- Cars passed by with a speed of 45, 50, or 55 km/h respectively
- Participant's task: Estimate the speed of the car (position: Pavement or centre island)

Participants

- 60 subjects (30 female), mean age 23.1 years

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Special thanks Alvin Chesham for his help with programming the virtual reality

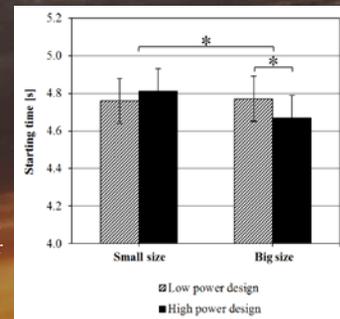
CONCLUSION

- Car design and car size seem to influence road crossing behaviour

RESULTS

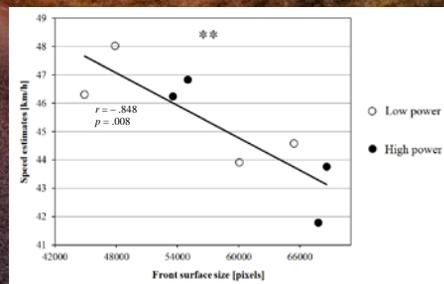
Block 1: Crossing time

- Car design: No effect for starting time, arrival time, and crossing duration (all p 's > .10)
- Car size: S's started to cross the road significantly earlier in front of big cars compared to small cars ($F(1,55) = 6.622, p = .013, \eta^2 = .107$)
- Car design \times car size interaction: S's crossed the road significantly earlier in front of big high power cars than in front of big low power cars ($F(1,55) = 6.622, p = .013, \eta^2 = .107$)



Block 2: Speed estimations

- Car design: Low power cars were perceived to be significantly faster than high power cars ($F(1,59) = 13.529, p = .001, \eta^2 = .187$)
- Car size: Cars with a small front surface were perceived to move significantly faster than cars with a big front surface ($F(1,59) = 126.512, p < .001, \eta^2 = .682$)
- Actual speed: Speed estimations differed significantly between 45, 50, and 55 km/h actual speed ($F(2,58) = 155.657, p < .001, \eta^2 = .845$)



DISCUSSION

- Car design seems to have an influence on road crossing behaviour in big cars
- Big cars compared to small cars: S's crossed the road earlier but estimated the speed to be lower?
- Decision to cross on average at a distance of 34 metres, image too small?
- Results in Block 2 can be explained by size-speed bias⁶⁾, according to which large objects seem to be moving more slowly than small objects

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