

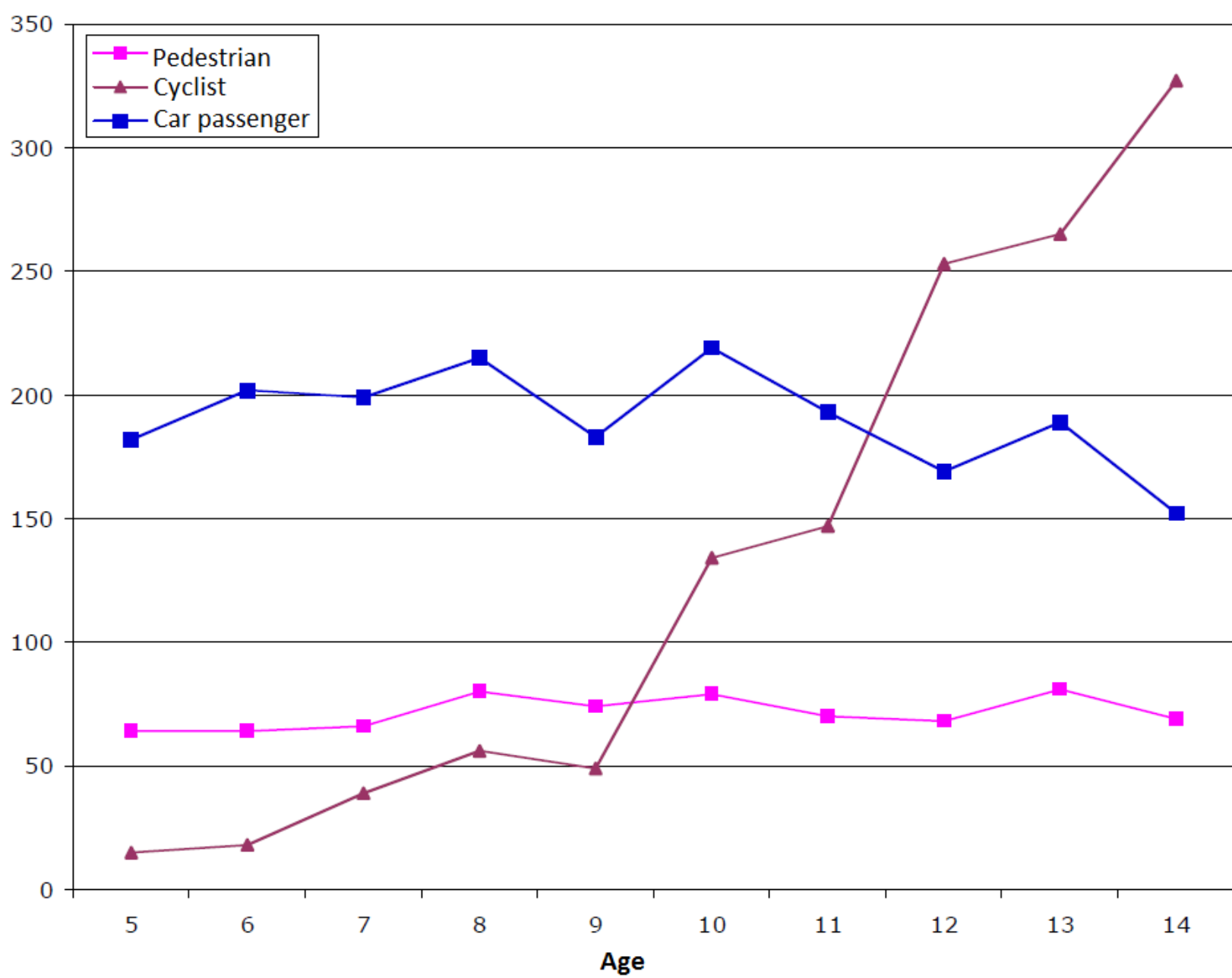
A hazard perception test for cycling children : an exploratory study

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Introduction

Figure 1 : Number of victims aged 5 to 14 in 2001



→ Causes ?

- increasing usage of bicycle
- Lack of cycling skills
- **Lack of cognitive skills**
- ...



→ Traffic related cognitive skills have been tested for young car drivers with a **Hazard Perception test** but not for children, although they might benefit even more from it than young drivers. Therefore : *An exploratory study to the use of a HP-test for testing the cognitive / traffic skills of young cyclists*

Methods

A convenience sample of **27 adults and 21 children** (16 females, 21,67±1,94y of age; 10 girls, 8,28 ± 0,46y of age respectively) completed a newly developed Hazard Perception test.



Figure 2 : A child performing the HP-test

Children were tested in an empty classroom in their school, adults were tested in a laboratory at Ghent University.

The HP-test consisted of **33 video-clips of 20 à 30 seconds**, shot from the point of view of a cyclist. Videos were presented on a 22" computer screen and Eye-movements were recorded using the Remote Eye-Tracking Device of SMI, operating at 120Hz.

The HP-test consisted three parts :

- 1) **Gaze behavior** : only watch the video, pretending they were cycling in the shown traffic situation (10 clips)
- 2) **Environmental awareness** : answer a question about video afterwards, example : what animal did you see, did you have priority, ... (10 clips)
- 3) **Hazard judgment** : click when you see a hazard on which you would pay extra attention + judge how dangerous you think this situation was on a scale from one to five.

Results

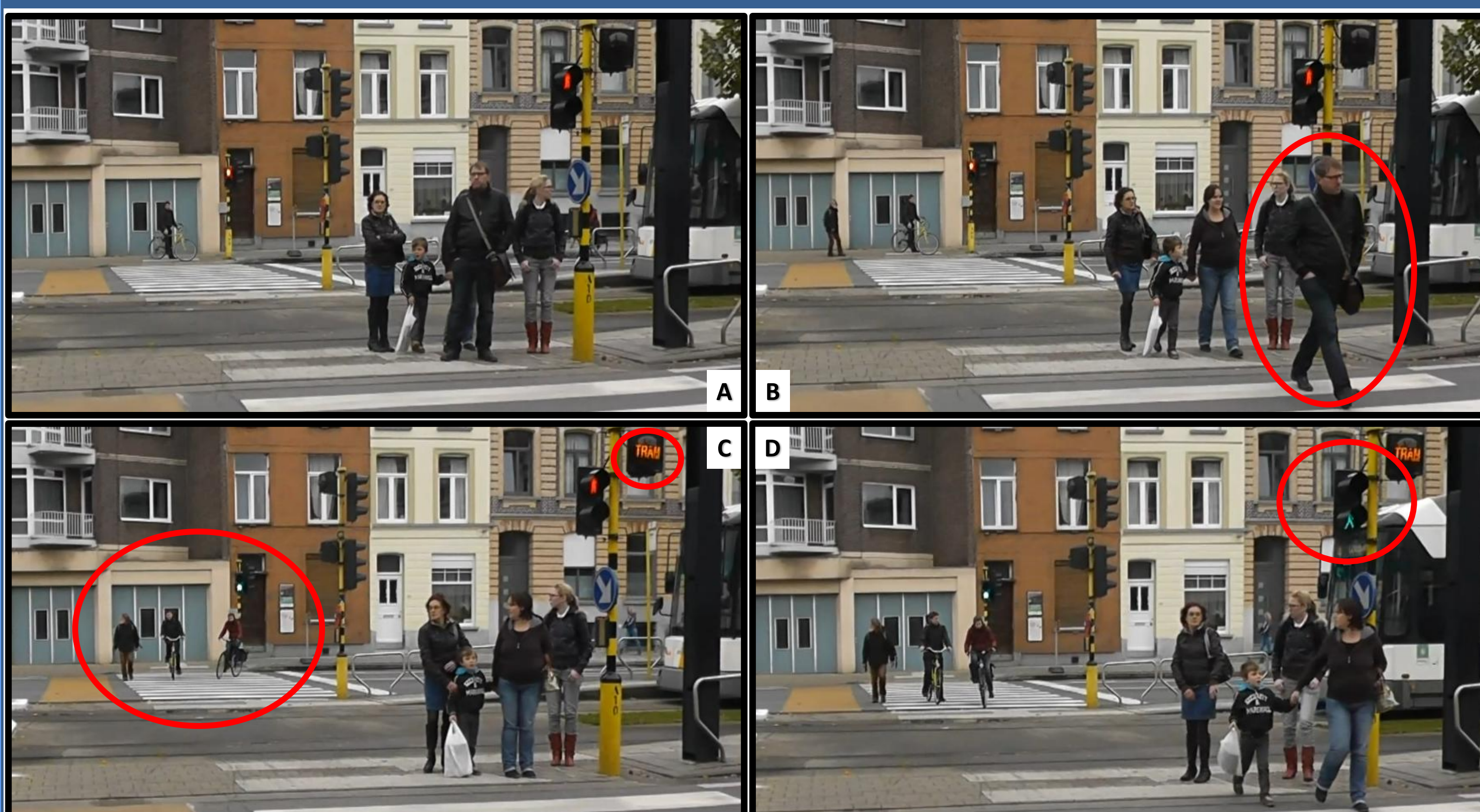


Figure 3: Case study – Pedestrian crossing

48% of the children and 4% of the adults indicated that they would cross the road before the right light turned green ($p < 0.001$).



Summary of results of each part of the HP test and QR-code of 3 of the videos

1) Gaze Behavior



- In general : few differences in dwell time towards different regions
- Children look more towards traffic signs
Bias : children had traffic school the week before the experiment
- Adults look more towards Cars
Adults are more aware of the hazardousness of cars

2) Environmental awareness



- Adults scored better on some videos
Adults possibly have a bigger useful field of view
- largest difference in video with distractions
Children are more easily distracted

3) Hazard Judgment



- Adults react more and faster to hazards
Children need more time to process information
→ Did not test basic reaction time
- Children judged most videos more dangerous
Children are not able to judge hazards adequately

Figure 4: Three filmstrips of videos shown in the hazard perception test. Full videos can be watched by scanning the QR-codes above.



Conclusions

Results show that **children do not yet have sufficient traffic experience to efficiently judge and react to hazardous situations**. These poor hazard perception abilities might be a cause for children's over-representation in accident statistics.

Future research

- improvement of hazard perception tests for children and adults
 - Better videos with more specific hazards
 - Multiple videos for same type of hazard
 - Automate data process to have quick access to results
- examine effectiveness of a hazard perception training
- Test the validity of the test : does a good score represent a good cyclist?
- Test effect of alcohol, music, fatigue, ... on hazard perception of cyclists

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