Who goes first? What cues do drivers rely on to evaluate a pedestrian’s intention at an intersection?

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Introduction

- We rely on cues provided by body language and facial expressions to navigate social interactions.
- There is little research on how these cues influence interactions between pedestrians and drivers at intersections.
- Eye-tracking data allows better understanding of how drivers detect and evaluate pedestrians.
- Hypothesis: Participants believe it is safe to proceed if the pedestrian is perceived to be aware of the car.

Method

Participants

- 10 university students (2 males, 8 females)
  - Age:
    - 19 – 43 yrs old (μ = 24.2 yrs; SD = 6.94 yrs)
  - Driving experience:
    - 0.5 – 27 yrs (μ = 8.2 yrs; SD = 7.17 yrs)

Procedure

- Vision Screening
  - Acuity test: Snellen Eye Chart
  - Color Vision Test: Ishihara Test
- Calibrated to Tobii 2 Pro Eye Tracking Glasses
- Participants given scenario asking them to imagine they were driving a car and to evaluate whether it was safe to proceed through the intersection
- Participants watched 18 driving videos, some contained pedestrians with different characteristics:
  - Body position (facing toward or away from the road)
  - Actions (walking or standing)
  - Eye contact or no eye contact
- After each video, participants were asked:
  1. If it was safe to continue driving straight
  2. If there was a pedestrian in the scene
  3. Their confidence rating the pedestrian's awareness of the car
- Demographics survey
  - Acquired gender, age, and driving experience

Next Steps

Data Analysis

- Import eye-tracking recordings into Tobii software
- Define pedestrians as Areas of Interest (AOIs) for each participant's eye-tracking recording
- Analyze collected data (Table 1)

Table 1. Data logged during study

<table>
<thead>
<tr>
<th>Data source</th>
<th>Parameter</th>
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</thead>
<tbody>
<tr>
<td>Eye-tracking</td>
<td>Time to first fixation (AOI)</td>
</tr>
<tr>
<td></td>
<td>Visit count (AOI)</td>
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<tr>
<td></td>
<td>Total fixation duration (AOI)</td>
</tr>
<tr>
<td></td>
<td>Fixation count (AOI)</td>
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<tr>
<td>Questions</td>
<td>Q1 – safe or unsafe</td>
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<td></td>
<td>Q2 – pedestrian detection</td>
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<td>Q3 – awareness rating</td>
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</tbody>
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Results

Results will show how participants’ judgments of “safe or unsafe” to proceed are related to a pedestrian’s body position (facing toward or away from the road), actions (walking or standing), and eye contact.

References

