Observing the observation of (vulnerable) road user behavior: a scoping review into current practices

Wouter van Haperen
(Transportation Research Institute – IMOB, Hasselt University)

RSS2017, 19-10-2017, Scheveningen
In-depth understanding of Accident Causation for vulnerable road users
Objectives

1. Summarizing scientific peer-reviewed publications
2. Investigating purposes and use
3. Identifying topics and behavioral indicators
4. Examining study characteristics
5. Preventing duplicate research efforts
Our focus

- Traffic safety
- Peer-reviewed journal articles
- English language
- Up to and including 2015
Studies observing the behavior of road users, in which the road users are not informed (beforehand) of their participation into the research project

<table>
<thead>
<tr>
<th>Observational</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revealed</strong></td>
<td><strong>Simulated</strong></td>
</tr>
<tr>
<td>Crash data</td>
<td>Behavioral Observation</td>
</tr>
<tr>
<td></td>
<td>Traffic conflict observation</td>
</tr>
<tr>
<td></td>
<td>Naturalistic Driving</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Our method

Scoping review

- To “map rapidly the key concepts underpinning a research area and the main sources and types of evidence available” (Mays et al, 2001)
- A systematic literature retrieval process, but not a meta-analysis or quality assessment

Databases used

- Web of Science
- ScienceDirect
- TRID
21243 references found

12188 unique references

Selection screening

7072 references for first screening

Relevance screening

701 references for second screening

Eligibility screening

600 references included
Road user focus

Cumulative Number of publications per year [#]

- Pedestrian
- Cyclist
- PTW
- Car
Purpose

- Monitoring
- Evaluation
- Model development
- Software development
Purpose

Number of published studies [#]

- PEDESTRIAN
- CYCLIST
- MOTORCYCLIST
- CAR DRIVER

- Monitoring
- Evaluation
- Model Development
- Software Development
Common data collection tools

Main data collection tools [#]

- Human Observer (Driver)
- Static camera (Driver)
- Human Observer (VRU)
- Static camera (VRU)
Topics

Categorization into 27 topics

Main Topics Driver-Studies

Main Topics VRU-studies

- Speeding
- Yielding
- Crossing
- Seatbelt use
- Overtaking
- Crossing
- Yielding
- Red-Light Running
Indicators

Categorization into 41 behavioral indicators

Main Indicators Driver-Studies

Main Indicators VRU-studies

- Speed
- Headway
- Yielding
- Red-Light Running
- Looking
- Seatbelt usage
- Red-Light Running
- Speed
- Crossing Path
- Looking
- Evasive Action
- Gap Acceptance

Publications [#]

1970s 1980s 1990s 2000s 2010s
Our reflection

- Meta-analysis of efforts on road user behavioral observation
- Focus on peer-reviewed journal articles
  - Grey literature?
- Reporting issues
  - Transferability and transparency of results
- Possible research gaps
  - E.g. railroad crossings, mobile phone while driving and motorcyclists
  - Other means of safety evaluation?
- Automated video analysis software tools
  - Publications in other journals?
Thank you very much for your attention!