Using behavioural observation studies to evaluate (vulnerable) road users‘ safety

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ICTCT, 22/10/2016, Lund, Sweden
Observing observation of road user behavior

A scoping review on current practices in scientific literature
Our objectives

1. Provide an overview of conducted road user behaviour observation studies

2. Assess the usefulness of behavioural observation

3. Identify topics and behavioural indicators

4. Prevent duplicate research efforts
Studies observing road user behaviour, in which the road users are not informed (beforehand) of their participation in the research (experiment).
Our focus

Traffic Safety

Peer-reviewed journal articles

- Not uncommon
- Available resources
- Publication bias
- Study objective

English
Methodology

A 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

Databases used

- Web of Science
- ScienceDirect
- TRID
The process

Web of Science (1937)  ScienceDirect (2545)  TRID (16761)
21243 references found

12188 unique references
Selection screening
- Conference Proceedings (3616)
- Book/Book sections (329)
- No journal article (221)
- Not peer-reviewed (569)
- Not in English (381)

7072 references for first screening
Relevance screening
- Not about road traffic (35)
- No uninformed observation (6331)
- Traffic Conflict Technique (5)

701 references for second screening
Eligibility screening
- Not about safety (18)
- No behavioral observations (23)
- Aware of experiment (26)
- Traffic Conflict Technique (9)
- Literature review (2)
- Irretrievable (23)

Duplicates (9055)

600 references included
Road user focus

- 223/600 (37%) studies included at least one VRU
- 490/600 (82%) studies included at least one Driver
Their purpose

The main goal of behavioural observation studies

- Software development in certain papers a side-goal or not directly linked to behavioural observation!
Common topics

VRU studies
• Crossing (39%)
• Yielding (22%)
• Red light running (10%)

Driver studies
• Speed (16%)
• Yielding (13%)
• Crossing (13%)
Common topics & indicators

VRU studies
- Crossing (39%)
- Yielding (22%)
- Red light running (10%)

Driver studies
- Speed (16%)
- Yielding (13%)
- Crossing (13%)

VRU studies
- Red light running (33%)
- Yielding (32%)
- Looking (22%)

Driver studies
- Speed (60%)
- Yielding (16%)
- Red light running (12%)
Testing sites

Number of sites per research purpose

- Monitoring
- Effectiveness Testing
- Model Development

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Reporting

Missing information

• Heavy vehicles
• Observation period
  • Week vs weekend (18% VRU; 47% Driver)
  • Day vs night (14% VRU; 33% Driver)
  • Peak vs off-peak (22% VRU; 53% Driver)
• Sample sizes
  • 13% VRU; 25% Driver
# SWOT analysis

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
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<tbody>
<tr>
<td>Internal factors</td>
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<tr>
<td><strong>Strengths</strong></td>
<td><strong>Weaknesses</strong></td>
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<tr>
<td>Behavioural and situational processes</td>
<td>Control of traffic events</td>
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<td>Natural driving behaviour</td>
<td>Data processing</td>
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<tr>
<td>Data quality</td>
<td>Control groups</td>
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<td></td>
<td>Bias</td>
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<td>External factors</td>
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<tr>
<td><strong>Opportunities</strong></td>
<td><strong>Threats</strong></td>
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<tr>
<td>Amount of data</td>
<td>Privacy legislation</td>
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<tr>
<td>Automated video-analysis software</td>
<td>Validity</td>
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<tr>
<td>Combination with other methodologies</td>
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</table>
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Thank you very much for your attention!

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