PEDESTRIAN RISK TAKING WHILE ROAD CROSSING: A COMPARISON OF OBSERVED AND DECLARED BEHAVIOUR

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BACKGROUND
Two main groups of methods for the analysis of pedestrian behaviour:
(i) Field observations: video recordings (e.g. at a junction area, on a train station, etc.), following and tracking pedestrians by means of a GPS or similar device, or - more recently - experiments in a virtual environment.
(ii) Questionnaire surveys: various scenarios for pedestrians to indicate their crossing intentions, or interviews on preferences, attitudes and behaviours.

Both methods have advantages and limitations.
- Field observations are more cumbersome and often require a degree of interpretation of the observed behaviour by the researcher.
- Questionnaire surveys benefit from more control over the design of the experiment and easier recruitment of the participants, however suffer from the known limitations of self-reported data.

In only a few studies behaviour observations are combined with questionnaire surveys in order to validate the two approaches. The results suggest that pedestrian observed and declared behaviour may differ in several occasions.

OBJECTIVES
The objective of this research is the comparative analysis of observed and declared behaviour of pedestrians as regards road crossing in urban areas.
- A field survey in Athens, Greece, combining declared behaviour data through a questionnaire with actual observations of pedestrian crossing behaviour.
- Data cross-tabulated to identify cases where observed and declared behaviour are concordant or discordant, for two crossing behaviours: diagonal crossing and mid-block crossing.
- Results analysed for different road types: major urban arterials, main urban roads or minor / residential roads.
- Age and gender effects are also explored.

FIELD OBSERVATIONS
The field survey site is located in Athens, from Evangelismos metro station to Kolonaki square.
A panel of 75 young and middle-aged pedestrians (out of which 40 males) were asked to walk in different road and traffic conditions.

Three walking conditions and eight crossing scenarios (see Figure):
- Crossing a main urban road with signal controlled and uncontrolled crosswalks: scenarios 1, 8;
- Crossing a minor (residential) road with marked crosswalks: scenarios 2, 5, 6, 7;
- Crossing a major urban arterial with signal controlled crosswalks: scenarios 3, 4.

QUESTIONNAIRE
Section A: Demographics
Section B: Mobility and travel motivations
Section C: Attitudes, perceptions and preferences
Section D: Self-assessment and identity
Section E: Behaviour, compliance and risk taking
Section F: Opinion on drivers

RESULTS

<table>
<thead>
<tr>
<th>Diagonal Crossing</th>
<th>Mid-block crossing per road type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed Declared</td>
<td>Observed Declared</td>
</tr>
<tr>
<td><strong>Minor / residential roads</strong></td>
<td><strong>Major roads</strong></td>
</tr>
<tr>
<td>Never</td>
<td>2</td>
</tr>
<tr>
<td>Rarely</td>
<td>11</td>
</tr>
<tr>
<td>Sometimes</td>
<td>5</td>
</tr>
<tr>
<td>Often</td>
<td>2</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observed Declared</th>
<th>Observed Declared</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male pedestrians</strong></td>
<td><strong>Female pedestrians</strong></td>
</tr>
<tr>
<td>Never</td>
<td>19</td>
</tr>
<tr>
<td>Rarely</td>
<td>11</td>
</tr>
<tr>
<td>Sometimes</td>
<td>5</td>
</tr>
<tr>
<td>Often</td>
<td>2</td>
</tr>
<tr>
<td>Always</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>35</strong></td>
</tr>
</tbody>
</table>

Observations and declared frequency of diagonal crossing fully concordant for only 30% of participants.

- Pedestrians declared to rarely cross diagonally, but never did so (15.3%)
- Pedestrians declared to often cross diagonally, but did so only sometimes (12.5%).
- Discords are mostly among ‘neighbouring’ categories
  - On major roads 55% of the participants had fully concordant behaviour
  - Some pedestrians declared never crossing at mid-block but did so sometimes (15.5%) or even always (1.4%),
  - Others declared sometimes but never actually did so (26.8%).
- On main/secondary roads concordance of behaviour is very high
  - On minor / residential roads only 33.3% of behaviours are concordant
  - More than 98% of participants declared that they sometimes or always cross at mid-block, but 50.7% of them never actually did so.
- May be due to the lack of constraints (e.g. low or no traffic), making junctions undistinguishable from mid-block locations.

Effects of age group and gender

No significant differences between males and females on major or main roads. Females have more discordant declared and observed crossing behaviour on minor roads.

Young pedestrians have lower concordance compared to the average.

- More often declare mid-block crossing than actually observed.

CONCLUSIONS
Overall, pedestrians observed behaviour is in accordance with the declared behavior.
- A small share of pedestrians may cross at mid-block even at major roads.
- More discordance in less demanding traffic conditions.
- Weak tendency of females to overestimate their declared behaviour on minor roads, the opposite was the case for male pedestrians on major roads.
- A tendency of young pedestrians to declare more frequently crossing at mid-block than they actually did.

NEXT STEPS
- Declared frequencies (‘never’, ‘sometimes’ etc.) should be weighted to the total exposure or walking activity of pedestrians.
- Larger sample and more representative sample.
- Future implications for practitioners: a rigorous design may not prevent risk-taking intentions and behavior.

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