MOTORCYCLISTS’ RISKY BEHAVIOR AT T-JUNCTION: AN EXPLORATORY STUDY

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Analysis of the relationship between behavioral variables and conflicts according to the Swedish Traffic Conflict Technique

BACKGROUND/MOTIVATION
- Motorcycle crashes in Malaysia – 60%
- Unsignalised urban T-Junction are crash prone sites.

AIM
To explore the BEHAVIOR of motorcyclists and the contribution of the observed behavioral variables to traffic conflicts.

METHOD
Behavioral observations and registering conflicts according to the Swedish Traffic Conflict Technique with the aid of software analysis (T-Analyst).

1. Site
   - T-Junction (Collector)
   - Location: Kuala Lumpur

2. Video recording
   - 3 consecutive months
   - 7 a.m. – 7 p.m. (Daylight)

3. Analyses
   - Observing motorcyclists’ behavior (e.g. gap)
   - Identifying conflicts
   - Analysing relationship: Behaviour vs conflict

STATISTICAL ANALYSIS
With help of logistic distribution it is possible to link the probability p of observed covariates to conflicts

\[
\logit(p) = \log\left(\frac{p}{1 - p}\right) = \alpha + \sum \beta_i \cdot x_i
\]

\(\alpha\) and \(\beta_i\) are regression terms; and \(x_i\) are the covariates included into the models.

RESULTS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>DF</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>Pr &gt; ChiS</th>
<th>Exp(Est)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1</td>
<td>2.0508</td>
<td>0.5714</td>
<td>12.8815</td>
<td>0.0003</td>
<td>7.774</td>
</tr>
<tr>
<td>Eagerness to enter the T-Junction</td>
<td>0</td>
<td>1.1583</td>
<td>0.3266</td>
<td>12.5781</td>
<td>0.0004</td>
<td>3.184</td>
</tr>
<tr>
<td>Gap on the major road</td>
<td>0</td>
<td>1.4286</td>
<td>0.3525</td>
<td>16.4268</td>
<td>&lt;.0001</td>
<td>4.173</td>
</tr>
<tr>
<td>Hesitancy to enter the T-Junction</td>
<td>0</td>
<td>1.7294</td>
<td>0.4437</td>
<td>15.608</td>
<td>&lt;.0001</td>
<td>0.177</td>
</tr>
<tr>
<td>Slowing down while approaching the T-Junction</td>
<td>0</td>
<td>1.6304</td>
<td>0.4435</td>
<td>13.5136</td>
<td>0.0002</td>
<td>5.106</td>
</tr>
<tr>
<td>Stop at the stop line</td>
<td>0</td>
<td>-0.854</td>
<td>0.3497</td>
<td>5.9632</td>
<td>0.0146</td>
<td>0.426</td>
</tr>
</tbody>
</table>

When the gap is limited, the probability of conflict could occur is around 0.9 whereas 0.6 when the gap is ample.

CONCLUSIONS
- After a stepwise variables-selection starting with 19 variables, only 5 were found statistically significant with a p-value < 0.05.
- To test the contribution of each single variable in the logit model the elasticity of variable has to be computed.
- Speed of the motorcycles while approaching the junction has the highest influence on the probability to be involved in a conflict.

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