Greek driver attitudes towards aggressive driving

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Presentation Outline

1. Objective
2. Scientific literature findings
4. Factor Analysis for Grouping Variables
5. Binary Logistic Regression
6. Elasticity Analysis
7. Sensitivity Analysis
8. Conclusion
9. Future Research Suggestions
Objective

- Investigation of the **characteristics of driver aggressiveness** in Greece through perceptions on their own behavior and the behavior of other drivers.
- Identification of the **factors** that cause aggressive driving.
- Clarification of the term “aggressive driving” & the **driving behaviors** they characterize it.
- Investigation of the relationship between aggressive driving and **driver involvement** in a road crash.
Scientific Literature Findings

- A significant proportion of drivers admits that driver aggressiveness is a noteworthy issue.
- Young male drivers were found to be more aggressive with a history of traffic fines and violations.
- Conflicts involving aggressive drivers are estimated to be 7-61% more severe compared to normal drivers.
- Personality has significant correlations with aberrant/deviant driving behavior.
- A critical part of aggressiveness lies in what can be termed as 'driving culture' or 'road safety culture'.
- Driving culture can vary wildly in regions that are more distanced from each other.
SafeCulture Project (2018)

The questionnaire survey conducted within the SafeCulture framework in Greece focused on **two regions:**
- Athens
- Rhodes

**Questions:**
- Regarding the driver (demographics/behavior)
- Regarding the driver’s friends
- Regarding driving in their country
- Regarding driving in their municipality

**Main Questions:**
- 5 regarding speed
- 6 regarding overtaking behaviour and aggressiveness
- 3 regarding alcohol consumption

Final sample size consisted of **503 drivers** in total:
- 302 **private car** drivers
- 201 **two-wheeler** drivers

Apostolos Ziakopoulos, Greek driver attitudes towards aggressive driving
## Factor Analysis for Grouping Variables

<table>
<thead>
<tr>
<th>Question Group</th>
<th>Question Description</th>
<th>KMO</th>
<th>Extraction</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speed</strong></td>
<td>When driving in Greece, I expect that other drivers do not respect speed limits on highways</td>
<td>0.841</td>
<td>0.698</td>
<td>0.835</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece, I expect that other drivers do not respect speed limits in urban areas</td>
<td></td>
<td>0.659</td>
<td>0.812</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece in my local municipality, I expect that other drivers do not respect speed limits on highways</td>
<td></td>
<td>0.611</td>
<td>0.788</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece in my local municipality, I expect that other drivers do not respect speed limits in urban areas</td>
<td></td>
<td>0.622</td>
<td>0.781</td>
</tr>
<tr>
<td></td>
<td>How many of your regular driving friends you believe do not respect speed limits in urban areas?</td>
<td></td>
<td>0.491</td>
<td>0.701</td>
</tr>
<tr>
<td><strong>Overtaking</strong></td>
<td>For every 10 trips: how often do you accelerate after stopping at a traffic light to overtake vehicles next to you?</td>
<td>0.731</td>
<td>0.520</td>
<td>0.798</td>
</tr>
<tr>
<td></td>
<td>For every 10 trips: how often do you overtake a slow driver from the internal (right) lane?</td>
<td></td>
<td>0.636</td>
<td>0.762</td>
</tr>
<tr>
<td></td>
<td>For every 10 trips: how often do you overtake in 2-lane roads when there is no congestion?</td>
<td></td>
<td>0.581</td>
<td>0.721</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece, I expect that other drivers overtake a slow driver from the internal (right) lane</td>
<td></td>
<td>0.313</td>
<td>0.645</td>
</tr>
<tr>
<td></td>
<td>How many of your regular driving friends you believe overtake a slow driver from the internal (right) lane</td>
<td></td>
<td>0.346</td>
<td>0.588</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece in my local municipality, I expect that other drivers overtake a slow driver from the internal (right) lane</td>
<td></td>
<td>0.416</td>
<td>0.559</td>
</tr>
<tr>
<td><strong>Alcohol</strong></td>
<td>When driving in Greece, I expect that other drivers drive while suspecting they are above allowed alcohol limits</td>
<td>0.680</td>
<td>0.608</td>
<td>0.823</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece, I expect that other drivers drive while suspecting they are above allowed alcohol limits</td>
<td></td>
<td>0.665</td>
<td>0.815</td>
</tr>
<tr>
<td></td>
<td>When driving in Greece in my local municipality, I expect that other drivers drive while suspecting they are above allowed alcohol limits</td>
<td></td>
<td>0.677</td>
<td>0.780</td>
</tr>
</tbody>
</table>
## Binary Logistic Regression

<table>
<thead>
<tr>
<th>Factor</th>
<th>Coefficient b</th>
<th>s.e.</th>
<th>Wald</th>
<th>d.f.</th>
<th>Sig.</th>
<th>Exp(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>exp(Factor: ‘Speed’)</td>
<td>-0.203</td>
<td>0.075</td>
<td>7.224</td>
<td>1</td>
<td>0.007</td>
<td>0.817</td>
</tr>
<tr>
<td>Factor: ‘Overtaking’</td>
<td>0.331</td>
<td>0.144</td>
<td>5.310</td>
<td>1</td>
<td>0.021</td>
<td>1.393</td>
</tr>
<tr>
<td>Location [Athens] (Ref. Rhodes)</td>
<td>-0.555</td>
<td>0.216</td>
<td>6.614</td>
<td>1</td>
<td>0.010</td>
<td>0.574</td>
</tr>
<tr>
<td>Driving experience [&gt;20 years] (Ref.)</td>
<td>-</td>
<td>-</td>
<td>14.099</td>
<td>2</td>
<td>0.001</td>
<td>-</td>
</tr>
<tr>
<td>Driving experience [11-20 years]</td>
<td>-0.870</td>
<td>0.245</td>
<td>12.613</td>
<td>1</td>
<td>0.000</td>
<td>0.419</td>
</tr>
<tr>
<td>Driving experience [0-10 years]</td>
<td>-0.445</td>
<td>0.218</td>
<td>4.158</td>
<td>1</td>
<td>0.041</td>
<td>0.641</td>
</tr>
<tr>
<td>Education level [up to high school] (Ref. Univ. or higher)</td>
<td>-0.409</td>
<td>0.202</td>
<td>4.089</td>
<td>1</td>
<td>0.043</td>
<td>0.664</td>
</tr>
</tbody>
</table>

According to the respondents, the factor overtaking is **positively** correlated with past crash involvement.

The majority of respondents **ignore** and do not fully understand the correlation of speed with road crashes.
### Elasticity Analysis

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>CoefficientB</th>
<th>S.E</th>
<th>Wald</th>
<th>ei</th>
<th>ei*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location [Athens]</td>
<td>-0.555</td>
<td>0.216</td>
<td>6.614</td>
<td>-0.34</td>
<td>-1.36</td>
</tr>
<tr>
<td>Education level [higher education]</td>
<td>-0.409</td>
<td>0.202</td>
<td>4.089</td>
<td>-0.25</td>
<td>-1.00</td>
</tr>
<tr>
<td>Driving experience [11-20 years]</td>
<td>-0.870</td>
<td>0.245</td>
<td>12.613</td>
<td>-0.42</td>
<td>-1.68</td>
</tr>
<tr>
<td>Driving experience [0-10 years]</td>
<td>-0.445</td>
<td>0.218</td>
<td>4.158</td>
<td>-0.27</td>
<td>-1.08</td>
</tr>
<tr>
<td><strong>Discrete Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exp(Factor: Speed)</td>
<td>-0.203</td>
<td>0.075</td>
<td>7.224</td>
<td>0.35</td>
<td>35.00</td>
</tr>
<tr>
<td>Factor: Overtaking</td>
<td>0.331</td>
<td>0.144</td>
<td>5.310</td>
<td>0.01</td>
<td>1.00</td>
</tr>
</tbody>
</table>

- The **most important factor** appears to be the speed.
- The second most important factor is **driving experience** from 11 to 20 years.

It seems that drivers, despite underestimating the dangers of speed, eventually realize the consequences indirectly. Therefore, **the danger of speeding** is not immediately perceived by road users.
For the **specific value** of exp(Factor: ‘Speed’) and Driving Experience

- Relative probability of crash involvement (%) in **Rhodes** > Relative probability of crash involvement (%) in **Athens**
- The relative probability of crash involvement shows a **downward trend** with respect to speed increases
Sensitivity Analysis (2/2)

For the specific value of Factor: ‘Overtaking’ and Education Level

- Relative probability of crash involvement (%) in Rhodes > Relative probability of crash involvement (%) in Athens
- The relative probability of crash involvement shows an upward trend with respect to overtaking increases
Conclusion

- Drivers perceive some elements of aggressiveness as more contributing to crash involvement than others, mainly the factor involving overtaking behavior.
- The capital city of Athens was found to be perceived as a more risky location than the island of Rhodes.
- The direct impacts of speed (and speeding) appear to be underestimated.
- Driver experience was found to increase crash involvement likelihood in the past two years (probably through increased exposure).
- The impacts of higher education are also disregarded in the perception of drivers.
- Alcohol was not found to be statistically significant, disregarding a lack of perception of its negative effects on road safety on behalf of drivers.
Suggestions for Further Research

- Conducting research in a larger sample of participants and in more countries

- Applying different methods of statistical analysis, such as random effects between regions

- Consider additional factors of the SafeCulture research, such as the use of mobile phone while driving

- Develop models with the same variables for Norway but also for other countries so that comparisons can be made between countries
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