Risk perception assessment in young novice drivers

The role of Portuguese driving training system in the acquisition and development of this competence

Ana Milhano & Cláudia Alves

Dublin, 6 June 2014
Agenda

1. Overview of driving training and testing process in Portugal
2. The role of risk perception
3. Our research
4. Presentation of the main results and findings
5. Preliminary conclusions and next steps
Overview of driving training and testing process in Portugal

Portugal has a traditional training and assessment system

Theory, Training and/or Practice

- Previous requirements: Minimum age: 18 years; Physical, mental and psychological fitness
- Mandatory course; Licensed driving schools; Minimum number of theory and practical lessons; Certified instructors

Written Test and Driving Test

- Public and private exam centres; Certified examiners
- Curriculum regulated by Government (Driving Licence Directive)
- Theoretical test in a computer based system and a on road skills and behaviour test

Probationary License

Full License
4 processes play a role in hazard perception

Detect imminent danger
Risk assessment
Select actions to avoid danger
Implement the chosen actions

“The ability to read the road”, preventing potential hazards that develop in the road environment

Source: adapted DSA

1Horswill & Mckenna, 2004; ²Groeger, 2000
The role of risk perception

<table>
<thead>
<tr>
<th>Theoretical contents</th>
<th>Practical contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human error as the dominant factor in the accident</td>
<td>Adapting speed to traffic</td>
</tr>
<tr>
<td>Visual perception in driving performance</td>
<td>Driving self assessment – Be able to take the best decision</td>
</tr>
<tr>
<td>Strategies for anticipating and predicting the potential dangerous of the road elements</td>
<td>Commented driving</td>
</tr>
<tr>
<td>Assessment of risk and the accepted lower risk</td>
<td>Independent driving</td>
</tr>
</tbody>
</table>

---

46th CIECA Congress Dublin 4th – 7th June 2014
Goals of our research

Knowing that training and assessment system for drivers candidates in Portugal already includes topics related to risk perception skills.

But considering that this is a traditional system, with possible limitations in the acquisition and development of higher skills.

We set out to investigate the impact of certain parameters of the system, in the levels of risk perception skills in a sample of young novice drivers.
**Overall objective**

To assess risk perception skills, such as visual perception and acceptance of risk by young novice drivers, to know the role that driving schools in Portugal have in the acquisition and development of these skills.

**Specific objectives**

- Identify if certain characteristics of driver training contribute to better risk perception skills.
- Identify if patterns of behaviour influence risk perception skills.
- Identify if certain factors influence risk perception skills.
Our research

Method

Sample

✓ N=68
✓ University students, category B driving license, issued in Portugal
✓ Age: 18 to 26 years; Average (21.96 years); SD (1.32)
✓ Gender: M = 31 (46%); F = 37 (54%)
✓ 35 (51%) in the probationary period (< 3 years); 33 (49%) in the post-probationary period (> 3 to 5 years and 4 months)
Materials

1. Psychological tests to assess risk perceptions skills (Vienna Test System)

2. Questionnaire and data from exams (IMT database)

- Collect information of the training process and the impact when driving solo
- Importance given by driving schools in contents related with risk perception
- Driving experience (years of license; hours and km/week of driving)
- Driving behaviour and attitudes (traffic offenses and accidents)
Risk perception assessment in young novice drivers

Milhano & Alves

Our research

**Traffic Perception Test**

- **Tachistoscopic Traffic Perception Test (TAVTMB):** assesses visual perception performance and perceptive speed in tasks with short presentations (1 second) of traffic situations.

**How is the test?**

Variable: "Obtaining an overview"

- A high percentile rank (PR>84) indicates a well-developed ability to perceive and quickly respond.

- 22 pictures (2 training)
Variable: “Willingness to take risks in traffic situations” – A high percentile rank (PR>84) indicates a low level of subjectively accepted risk measured by the distance from the moment of danger, in hundredths of seconds. Individuals tend to accept a lower degree of objective danger.

Vienna risk-taking test traffic – WRBTV: measures the subjectively accepted level of risk in potentially dangerous driving situations in accordance with Wilde’s theory of risk homeostasis.

Our research

24 traffic situations in video format

Multiple traffic situations
Our research

**Procedure**

Participants were given standardized information about how to perform each test.

They were asked to answer truthfully and to position themselves as if they were in a natural driving environment.

Then, completed two psychological tests and the online questionnaire.

In total, the assessment lasted for about 50 minutes.
Global psychological tests results

✓ Young novice drivers have percentiles in the average (25 to 75) in both psychological tests

<table>
<thead>
<tr>
<th>Table 1. Percentiles – TAVTMB (n=68)</th>
<th>Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;16 = Below-average</td>
<td>39,61</td>
<td>22,40</td>
</tr>
<tr>
<td>16-24 = Below-average to average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-75 = Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-84 = Average to above average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;84 = Clearly above average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2. Percentiles – WRBTV (n=68)</th>
<th>Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;16 = Below-average</td>
<td>43,75</td>
<td>29,02</td>
</tr>
<tr>
<td>16-24 = Below-average to average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-75 = Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-84 = Average to above average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;84 = Clearly above average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Presentation of the main results and findings

**Training Curriculum**

- Participants who consider that driving schools give more importance to risk perception have lower willingness to take risks (> WRBTV) and less accurate overview of traffic situations (< TAVTMB).
Risk perception assessment in young novice drivers
Milhano & Alves

Presentation of the main results and findings

Success in theoretical and practical tests

- Training tends to last longer for women than men.
- Men have higher % approval in both tests at first attempt.
- Participants who approve at first attempt (T+P tests) have better performance in TAVTMB and WRBTV.
- It is not clear the relation between the duration of training and the tests results.
Specific difficulties after obtaining the driving license

- Participants who report more difficulties in driving, have higher willingness to take risks (< WRBTV) and also report difficulties in skills related to vehicle control.

Tests results according to the difficulties in driving after obtain the driving license (n=68)

- Average TAVTMB
- Average WRBTV

<table>
<thead>
<tr>
<th></th>
<th>&lt; Difficulties in driving (n=33)</th>
<th>&gt; Difficulties in driving (n=35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>Average</td>
<td>Average</td>
</tr>
<tr>
<td>1</td>
<td>39.84</td>
<td>48.45</td>
</tr>
<tr>
<td>2</td>
<td>39.40</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>39.31</td>
<td></td>
</tr>
</tbody>
</table>
Drivers that report more frequently offensive behaviours have higher ability to perceive traffic situations (> TAVTMB) and higher willingness to take risks (< WRBTV).

**Self-report behaviours of traffic offenses**

- **Most practiced traffic offenses**:
  - Speeding: 55
  - Abandonment of the right of way: 48
  - Do not give way to pedestrians in crosswalks: 45

- **Less practiced traffic offenses**:
  - Driving while talking on the phone: 60
  - Driving under the influence of alcohol: 66

**Tests results according to the frequency of offense behaviours (n=68)**

- Average TAVTMB: 42.56 (25th percentile), 46.61 (50th percentile)
- Average WRBTV: 40.53 (25th percentile), 60 (75th percentile)

**Presentation of the main results and findings**
Register and report traffic offenses

- 16% (n=11) of the sample were involved in 23 traffic offenses (19 men; 4 women).

Traffic offenses are mainly committed by men and specially after the probationary period.
Presentation of the main results and findings

Involvement in self-reported road accidents

- Drivers with accidents (44%) have a less accurate overview of traffic situations (< TAVTMB)
- Accidents were due to collisions

Risk perception assessment in young novice drivers
Milhano & Alves

Tests results according to accidents (n=68)
Driving experience

The higher the driving experience (measured in years of driving license, driving hours/week; km driving/week) the higher the performance in both tests (TAVTMB and WRBTV)
Drivers age range 18.87 to 21.86 years (n=34) shows higher performance in both tests (TAVTMB and WRVTB). Younger's have more accurate overview of traffic situations and less willingness to take risks, compared to the age group from 21.87 to 26.13 years.
Gender

✓ Gender shows an ability to forecast Vienna risk-taking test traffic – WRBTV of 22.3% (Analysis of Categorical Regression – CATREG)

✓ Men have higher willingness to take risks, while they have better performance in TAVTMB – more accurate overview of traffic situations

✓ The performance in WRBTV test was significantly lower in men than in women
Results show that

Participants have average levels in risk perception skills and, in general, feel that driving schools give importance to areas related to risk perception. However, after obtaining the license, most of them indicate difficulties in driving related to the acquisition and development of these higher skills.

The results do not permit to establish the influence of the training process on the acquisition and development of risk perception skills.

The results show that as the driving experience increases, the risk perception skills also increases, both in the ability to perceive a traffic situation accurately and quickly, or in the decrease of the accepted level of risk. The same is not true for the variable age.
Results show that

The results suggest that there is a bias in driving training, which benefits men, but does not seem to promote the acquisition and development of the higher skills of risk perception.

Male drivers, having more developed skills of visual perception and perceptive speed, may feel a sense of self control and self-confidence. This may explain a significant higher willingness to take risks in traffic situations, when compared to female drivers.
Next steps

Increase the sample to determine or confirm eventual correlations between independent variables and the psychological tests applied

Study other populations and age groups

Specific training and assessment of hazard perception in Portugal may be an asset
Acknowledgements

- University students that participated and professors who took available academic time for this research
- To IMT, for all the support in the study
- Universities that supported the study:
  - University of Lisbon
    School of Economics & Management (ISEG)
    School of Social and Political Sciences (ISCSP)
  - ISCTE/IUL - Lisbon University Institute
- Professors Ricardo Ramos Pinto (ISCSP) and Maria Ana Vitorino (Carlson School of Management, University of Minnesota) for their collaboration in the statistical analysis
- Susana Paulino (Driving Training Department, IMT), for having challenged us to investigate this area, Elsa Caldes and Flávia Campos, who assisted in the sample collection, and all the colleagues from IMT, for their support and review
Thank you for your attention

Ana Milhano – aiantunes@imt-ip.pt
Cláudia Alves – mcalves@imt-ip.pt