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

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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, according to predefined contents (EU Driving Licence Directive)
- Theoretical test in a computer based system and a on road skills and behaviour test
Overview of driving training and testing process in Portugal

Portugal has a traditional training and assessment system

**Probationary License**
- Probationary period (3 years) – License revoked if newly drivers commit serious traffic offenses
- Blood alcohol limit allowed decreased to 0.2 g/l

**Full License**
- After probationary period without practicing traffic offenses
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The role of risk perception

Hazard perception (HP)

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

4 processes play a role in hazard perception

1. Detect imminent danger
2. Risk assessment
3. Select actions to avoid danger
4. Implement the chosen actions

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>

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Our research

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.
Identify if certain characteristics of driver training contribute to better risk perception skills

- Training curriculum
- Duration of training
- Success in tests (T+P)

Identify if patterns of behaviour influence risk perception skills

- Specific difficulties after obtaining the driving licence
- Practice of traffic offenses
- Involvement in road accidents

Identify if certain factors influence risk perception skills

- Driving experience
- Age
- Gender

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Our research
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)
Our research

Materials

1. 2 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)
Tachistoscopic Traffic Perception Test – TAVTMB: assesses visual perception performance and perceptive speed in tasks with short presentations (1 second) of traffic situations

Variable: “Obtaining an overview” – A high percentile rank (PR>84) indicates a well-developed ability to perceive a situation accurately and quickly – 22 pictures (2 training)
How is the test?

Tachistoscopic Traffic Perception Test – TAVTMB

Our research

Pedestrian, children
Motor vehicle
Bicycle, motorcycle, scooter
Road sign
Traffic light

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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.

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

- 24 traffic situations in video format
- Multiple traffic situations

Our research
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>Table 2. Percentiles – WRBTV (n=68)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average</strong></td>
<td><strong>Average</strong></td>
</tr>
<tr>
<td>39,61</td>
<td>43,75</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td><strong>SD</strong></td>
</tr>
<tr>
<td>22,40</td>
<td>29,02</td>
</tr>
</tbody>
</table>

**PERCENTILE RANK**

≤16 = Below-average
16-24 = Below-average to average
25-75 = Average
75-84 = Average to above average
>84 = Clearly above average
Training Curriculum

✓ Driving schools seem to give importance to contents related to risk perception

![Importance given to the contents of the curriculum (n=68)](chart.png)

- Rules and road signs: 68
- Behaviors to adopt towards other road users: 67
- Defensive driving: 65
- Traffic offenses: 65
- Attitudes and behaviors in safe driving: 64
- Evaluation of the driving distances: 64
- Eco-driving: 54
- Driving route: 52
- Vehicle maintenance: 45
- Emotional state of the driver: 37

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Training Curriculum

✓ Participants who consider that driving schools give more importance to the overall curriculum have lower willingness to take risks (> WRBTV) and less accurate overview of traffic situations (< TAVTMB)

Presentation of the main results and findings
Duration of training

- Training tend to last longer for women than men.
- It is not clear the relation between the duration of training and the tests results.
Success in theoretical and practical tests

- 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
Specific difficulties after obtaining the driving license

- Most difficulties are related to risk perception

<table>
<thead>
<tr>
<th>Difficulties in driving after obtain the driving license (n=68)</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predict the behavior of other drivers</td>
<td>60</td>
</tr>
<tr>
<td>Rate speed and distance between vehicles</td>
<td>56</td>
</tr>
<tr>
<td>Perceive danger in traffic</td>
<td>55</td>
</tr>
<tr>
<td>Perform the overtaking maneuver</td>
<td>54</td>
</tr>
<tr>
<td>Driving with the seat belt</td>
<td>66</td>
</tr>
<tr>
<td>Do not drive after consuming alcohol or other drugs</td>
<td>58</td>
</tr>
<tr>
<td>Recognize traffic signs</td>
<td>45</td>
</tr>
<tr>
<td>Break to avoid dangerous situations</td>
<td>39</td>
</tr>
</tbody>
</table>
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.
### Presentation of the main results and findings

**Self-report behaviours of traffic offenses**

<table>
<thead>
<tr>
<th>Behaviors of traffic offenses</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding</td>
<td>55</td>
</tr>
<tr>
<td>Not keep the safe distance from the vehicle ahead</td>
<td>48</td>
</tr>
<tr>
<td>Do not give way to pedestrians in crosswalks</td>
<td>45</td>
</tr>
<tr>
<td>Improper use mobile phone</td>
<td>39</td>
</tr>
<tr>
<td>Do not stop at the STOP sign</td>
<td>39</td>
</tr>
<tr>
<td>Abandonment of the site of the accident if was intervenor</td>
<td>67</td>
</tr>
<tr>
<td>Disobedience police order</td>
<td>67</td>
</tr>
<tr>
<td>Driving under the influence of other drugs</td>
<td>66</td>
</tr>
<tr>
<td>No overtaking</td>
<td>60</td>
</tr>
<tr>
<td>Driving without the use of seat belts</td>
<td>60</td>
</tr>
</tbody>
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Self-report behaviours of traffic offenses

- Drivers that report more frequently offensive behaviours have higher ability to perceive traffic situations (> TAVTMB) and higher willingness to take risks (< WRBTV)
Register and report traffic offenses

✔ 16% (n=11) of the sample were involved in 23 traffic offenses (19 men; 4 women)
Register and report traffic offenses

✓ Traffic offenses are mainly committed by men and specially after the probationary period
Involvement in self-reported road accidents

✓ Drivers with accidents (44%) are evenly distributed by gender and age groups and most accidents were due to collisions
Involvement in self-reported road accidents

✓ Drivers with accidents have less accurate overview of traffic situations (< TAVTMB)
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).
Age

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)

✓ The performance in WRBTV test was significantly lower in men than in women
Men have higher willingness to take risks, while they have better performance in TAVTMB – more accurate overview of traffic situations.
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 increase, 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.
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