Gender differences in driver’s license theory test scores in the Netherlands

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Abstract

Introduction: Gender differences were investigated in a sample of persons (N=34,755) who completed the driver’s license theory test in the Netherlands. Results: Contrary to recent findings from Sweden, no gender differences were found. Impact of Industry: The present study signifies the importance of standardization in driver testing.

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1. Introduction

It is a well-known phenomenon that young male drivers are more involved in severe car crashes as compared to their female counterparts. To obtain better insight into gender differences among young drivers, Wiberg (2006) investigated the results of 11,862 persons who completed the Swedish driver’s license theory test in the period January 9, 2004 to February 9, 2004. Among the test-takers who took the theory test for the first time, males had a mean score of 52.70 out of a maximum of 65 as compared to 54.19 for females. The author considered that the inferior performance of males in the theory test could be a factor that explains why male drivers are overrepresented in road traffic crashes.

Inspired by the noteworthy findings of Wiberg (2006), we investigated whether gender differences in theory test results exist in the Netherlands as well. Additionally, we looked at the mediating role of age. For this purpose, we analyzed the scores of 34,775 persons who completed the Dutch driver’s license theory test in the period September 8, 2003 to November 12, 2003.

2. Theory test procedures in the Netherlands

All theory tests were taken at one of the 32 theory-testing locations of the Dutch Driving Test Organization (CBR). For the period under investigation, the Dutch theory test comprised 50 computerized questions: yes/no questions, multiple choice questions, and open questions (in which the test taker had to type in a number). The questions were asked orally based on images of traffic situations shown on large TV screens. Candidates were also able to read the questions on these TV screens. Candidates had to give answers by means of buttons on the desk. To pass the test, participants needed a minimum of 45 correct answers.

After successfully completing the theory test, a theory certificate is acquired that is valid for a period of 1 year. The learner driver must have a valid theory certificate before he/she can take the practical driving test. In the Netherlands, people are allowed to have on-road driving lessons and undertake the theory test only after turning 18 years old.

3. Sample under investigation

Results of 34,775 persons who passed the theory test in the period September 8, 2003 – November 12, 2003 were obtained from the CBR. Test results of failed tests (score 44 or lower) were not available. Note that, according to the CBR year report (CBR, 2003) of 2003, 202,680 of 410,779 candidates passed the theory test in this year.

4. Results

Table 1 shows the mean score of men and women. An independent t-test indicated that there was no statistically
significant gender difference (p=0.7). Fig. 1 shows the distribution of test scores of males and females. Again, no significant gender difference was identified.

Table 1 also shows that males had a lower mean age than females when passing the test (p<0.001 using a t-test). Note that this difference was larger than the age difference among theory test takers in Sweden (Wiberg, 2006), where mean ages of 19.64 and 19.85 years were found for males and females, respectively (overall SD 1.54 years). Fig. 2 illustrates the relationship between age and gender. It can be seen not only that the distribution of age is highly skewed, but also that those who passed the driving test at a very early age were mostly males.

### Table 1

<table>
<thead>
<tr>
<th></th>
<th>Men (n=16,627)</th>
<th></th>
<th>Women (n=18,148)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>95% CI</td>
<td>Mean</td>
</tr>
<tr>
<td>Test score [45–50]</td>
<td>46.69</td>
<td>1.394</td>
<td>46.67–46.71</td>
<td>46.70</td>
</tr>
<tr>
<td>Age [years]</td>
<td>21.12</td>
<td>5.641</td>
<td>21.03–21.21</td>
<td>22.69</td>
</tr>
</tbody>
</table>

*Note. Standard deviations (SD) and 95% confidence intervals (95% CI) were calculated assuming normal distribution. It should be noted, however, that the distribution of age was highly skewed.*

Fig. 1. Distribution of theory test scores for males and females. 95% confidence intervals were calculated for each score separately assuming binomial distribution.

Fig. 2. Proportion of females versus age when passing the theory test. The graph was created by sorting the persons according to their age and creating 100 groups of 347 of 348 persons each. Each point in the graph represents the percentage of females in the group versus the mean age of the group. The horizontal line depicts the proportion of females in the total sample (52.2%).
Conversely, persons who were involved in driver education at an older age were predominantly females.

Fig. 3 depicts the interaction between age and test score. Test score had a small significant negative correlation with age, both among men (Spearman correlation -0.0514, p < 0.001) and among women (Spearman correlation -0.0564, p < 0.001). We also calculated the mean male score and mean female score for each of the 100 groups shown in Fig. 3. A paired t-test revealed no statistically significant difference (p = 0.11), indicating that no gender differences were identified after correcting for age.

5. Discussion

In the Netherlands – contrary to the findings from Sweden – no gender differences in theory test scores existed among those who passed the test. This discrepancy could imply that gender differences in theoretical knowledge truly differed between countries at the time of taking the test, or that the theory test of one or both countries was somehow gender biased, or that the tests were measuring different aspects of theoretical knowledge. Therefore, no definite conclusions can be drawn of the supposed relationship between theory test scores and crash rate. Regardless of the explanation, the present results signify the need for improved standardization in driver training and testing procedures, so that valid comparisons become possible and valid conclusions can be drawn with respect to gender differences in traffic safety (see Baughan, Gregersen, Hendrix, & Keskinen, 2005 for further consideration).

The present study found no gender differences in theory test results for those who passed the test. Other studies have found no gender differences in the practical driving test (Wiberg, 2006; Nyberg, Gregersen, & Wiklund, 2007; both in Sweden). Conversely, others have identified considerably higher pass rates among males in the practical driving test (e.g., Crinson & Grayson, 2005, in the UK). Also, wide gender differences have been found in objectively-measured performance in driving simulators (De Winter, Wieringa, Kuipers, Mulder, & Mulder, 2007, in the Netherlands). The need for further research into gender differences in car driving was underscored by the World Health Organization (2002), which also stressed the need for standardization of data collection procedures.

A final remark is made with respect to effects of volunteer bias. Figs. 2 and 3 suggested that volunteer-bias effects can play an important role in driver statistics. It is unlikely that the decrease of test scores within a couple of months time reflects a true effect of age. It is much more likely that (predominantly male) drivers who obtained their license quickly after their 18th birthday had a very high motivation toward driving. According to Hatakka, Keskinen, Gregersen, Glad, and Hemetoski (2002), a highly car-oriented lifestyle could be particularly problematic for road safety. The present study illustrated that because of volunteer-bias effects, researchers should be cautious in interpreting driver-related statistics (e.g., in quantifying the effects of age on crash risk).

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References


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