

Improving safety in young drivers: in search of possible solutions

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Drs. D.A.M. Twisk

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Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV

SWOV Institute for Road Safety Research
P.O. Box 170
2260 AD Leidschendam
The Netherlands
Telephone 31703209323
Telefax 317032012612

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Divera A. M. Twisk
SWOV Institute for Road Safety Research, The Netherlands

Introduction

What's wrong with young drivers? What factors contribute to their high accident rate? In this presentation I will be putting forward the following thesis:

"There is possibly something wrong with young drivers, but there is definitely something wrong with how they are trained".

I will begin by introducing data from Dutch research on novice driver performance. How expertly do they drive?.

Next, I shall be discussing young driver accident analyses in comparison to performance data. Can novice drivers be held responsible for their high accident involvement?

Thirdly, on the basis of performance and accident data, missing but essential components of any driver training are described. Finally, in order to empirically evaluate the effectiveness of the postulated components, a one-day course was developed and tested.

At the end of this presentation, I shall therefore be discussing the evaluation results with respect to attitudes and driving performance. In other words: Does it really work?

All the data are based on research on the Dutch training system. The research was commissioned by SWOV and carried out in conjunction with other research institutes. Although, this thesis will be presented, using the Dutch driving system as an example, the insights obtained are also valid for training systems in other countries.

Driver training in the Netherlands

The Netherlands operates a highly comprehensive training and examination system for candidate drivers. Candidate drivers have to take a test of practical driving skills and they also have to pass an examination of traffic knowledge. In order to reach the required standards they need approximately 30 hours of practical training. After passing the test there are no restrictions on driving. The novice driver has the same privileges as any more experienced driver.

Driving performance

However research indicates, this training is not enough to reach adequate standards. In a study carried out by the Traffic Research Center in Holland, novice drivers and more expert drivers were compared. This study showed that novice drivers drove too fast for prevailing conditions (De Velde Harsenhorst & Lourens, 1988). This does not mean that they were speeding, but that the speed chosen was too fast to be safe. Moreover, their choice of speed to take account of the particular driving conditions.

Similar patterns were observed in young novice drivers who had held a driving licence for less than 3 months. These drivers were taken to drive in an unfamiliar town, and an official examiner assessed their driving performance. Their driving was also found to be too fast, or more accurately, appeared to be too fast to the observers (Vissers, 1990).

A comparable pattern was observed in a case study in which a young female candidate driver was observed during driver training and also a few months after she had acquired her driving licence. According to her driving instructor she drove much faster a few months after she passed her exam (De Velde Harsenhorst & Lourens, 1989).

Speed therefore appears to be a fundamental problem for novice drivers, even in conditions in which they attempt to perform optimally, and in which they are not being encouraged to show off .

Faulty speed choice is not the only characteristic of young novice drivers. Research shows that novice drivers are error prone. They tend to overlook important information, or "forget" essential components of a safety routine, such as looking over the right shoulder at a right hand turn, to check for cyclists and checking mirrors (De Velde Harsenhorst & Lourens, 1989).

Their driving routine is not stable, and errors seem to appear or disappear in an unsystematic way. Even if a driver has been faultless in certain routines for some time, a serious error may occur, almost unexpectedly.

How are we to interpret these observations? What is going wrong? Is there a general pattern? We believe there is. The pattern is that the task of driving is extremely complex. It is not complex in terms of vehicle control, in that novices know how to steer, they tend to respect speed limits, and have a good knowledge of traffic regulations. The complexity is of a more cognitive nature. It involves the ability to detect and evaluate dangers and to foresee that an apparently "normal" traffic condition, may change in seconds into a "dangerous" one. This cognitive ability needs to be developed. Moreover its application should also be more or less automatic (De Velde Harsenhorst & Lourens, 1990; Milech et al., 1989). Otherwise, the task of driving may exceed the resources of human attention and awareness. As a result drivers will become exhausted after only half an hour of standard driving.

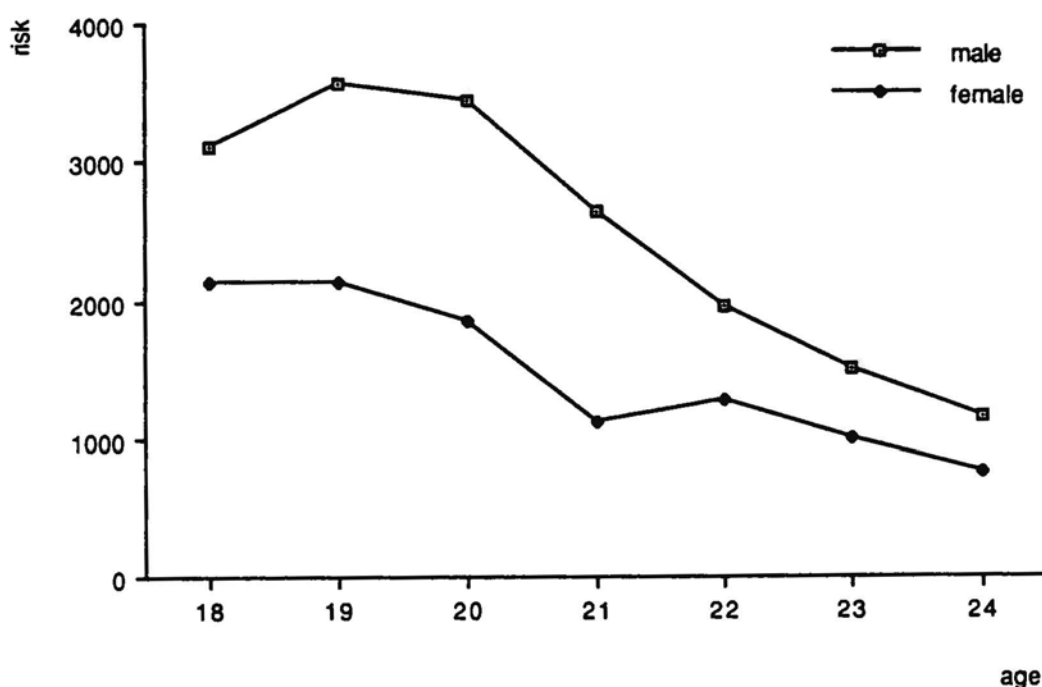
As a result, behaviour that is not automatic is prone to errors. This proneness to errors is intensified by stress factors. Stress factors negatively affect driver performance, especially the performance of inexperienced drivers. Examples of stress factors with known effects include haste, tiredness, but also alcohol in low doses.

We may conclude from this that even in a country such as the Netherlands in which a "comprehensive" driver training program has been developed, and relatively many lessons are taken, novice drivers are in general still very error prone and tend to make inappropriate speed choices.

Accidents

Does this show in accidents? At SWOV an accident analysis was carried out on young driver accident statistics (Van Kampen, 1988).

A comparison between younger and older drivers showed that young drivers are more at risk than their older counterparts (Figure 1). The accident risk among young drivers is about twice as high.



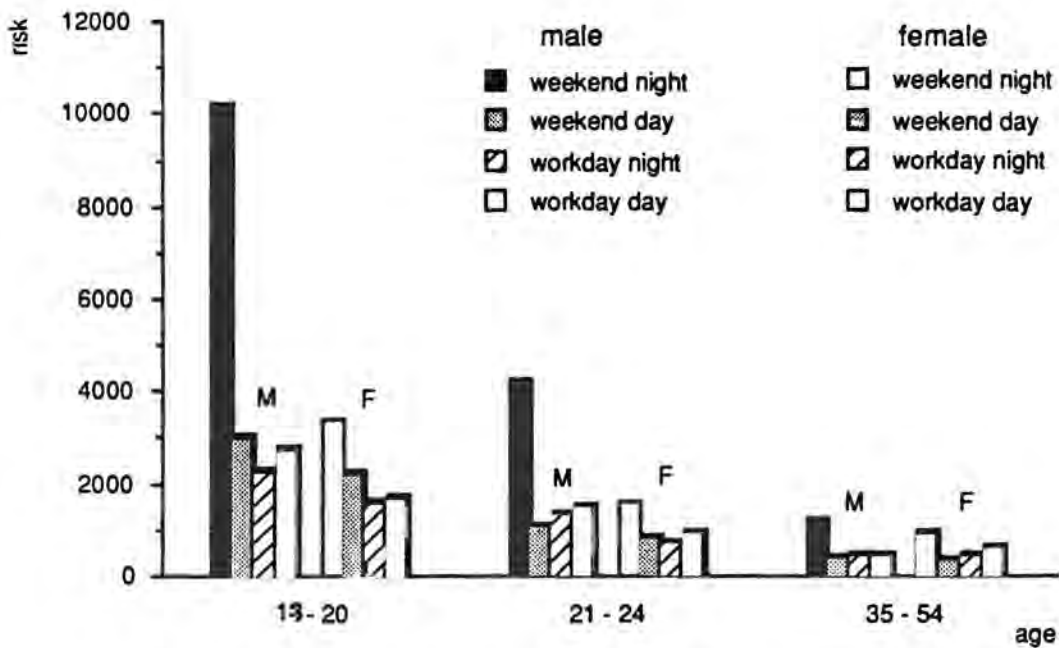
Accident risk by sex and age for car drivers.

Moreover, the analysis showed that young male drivers are more at risk than young female drivers. What can we conclude from this? Basically, that novice drivers are badly prepared for the task in hand.

On the other hand, four years of obtaining their licence, young drivers experience dramatically fewer accidents, and in terms of accident levers, are not very different from older drivers. It would therefore appear that young drivers do learn to drive safely, probably by trial and error.

A more detailed analysis of accident conditions showed large differences between age and sex groups (Figure 2). As you can see weekend nights are the most dangerous nights for all groups, but mostly for young male drivers.

These accident graphs - which are almost universal in nature - are often interpreted as being evidence of risk-taking.



Risk of car drivers by age, sex, day of the week, and time of day.

However in the light of the research on driving performance, lack of experience appears to be as important a factor. For example, the high accident rate during the weekend nights is often interpreted as being the result of risk-taking. Yet, in the light of the performance data, an alternative explanation is found. During weekend nights, the driver is often tired and carrying passengers. As a consequence the driving characteristics of the car may have changed. The driver may be easily distracted by social interaction with his passengers. Most likely, he has not experienced any of these conditions in driver training. Now he has to cope on his own, and sometimes he fails.

Countermeasures

Only when correct driving routines have become more or less automatic, can we expect that safety standards to have been achieved. However, this is only attained after hours and hours of practice (Milech et al, 1989). Throughout this stage, the novice driver should be protected, and allowed to train in a safe environment.

We could for example create such a safe environment by the introduction of accompanied driving or restrictions, such as a night curfew. In addition, the novice driver should drive more defensively and balance his own capabilities and the demands of traffic. He should be dissuaded from thinking that he is an expert driver. He should be made aware of the fact that he isn't yet able to cope with every driving condition.

A wide range of countermeasures could feasibly be applied. I will limit myself here to discussing a countermeasure aimed at the training stage. In traditional driver training young drivers learn to control their vehicle. Even at high speeds they learn to feel comfortable and confident. They experience feelings of control, which, looking at the

accident and performance data they clearly don't possess. There is reason to believe that novice drivers get desensitized to danger as a result of training (McDonald, 1985). An important last phase in driving instruction should therefore aim to increase the driver's awareness of his limitations. This might motivate the novice driver, to search for "safe conditions" under which to practice and to gain experience.

Experiment

With the assistance of driving instructors a one-day course was developed aimed to "re-sensitize" novice drivers. During one half of the day, young drivers trained on a traffic range and during the other half they drove in real traffic situations.

On the range the drivers were taken into a skid and experienced the difficulty, or rather the impossibility of controlling such a skid. They also experienced the effect of speed on skidding and emergency manoeuvring, such as braking. The practice session was limited to a few trials, in order to avoid habituation to the fear provoking experience, to avoid the development of false confidence and to keep experienced control at low levels.

On the road, youngsters drove in an unfamiliar town, and took their own decisions with respect to speed and choice of route. The instructor was non-directive in his commences and only reflected upon the driving decisions taken by the driver.

Evaluation results

This then is how it was meant to work and how it was implemented. But did it result in any changes?

Questionnaire:

In comparison to a control group, the drivers who participated in the one-day course had a more positive attitude with respect to safety related behaviour.

After the course more youngsters were reported to be willing to wear safety belts than before. They had a better understanding of the technique involved in emergency stops, without an increase in perceived control of dangerous situations. On the contrary: their intention to drive defensively was strengthened.

Driving performance:

Driving performance in both the course and control group was poor. If we assume the test to have been a driving exam, only 25% would have passed. Nevertheless, the course group performed significantly better than the control group. About 40% of the course group would have passed, while only 12% of the control group of the drivers would have passed.

Disappointingly, adequate speed choice did not differ between the two groups. The course group was no better than the control group (Vissers, 1990).

On the whole, however, the course appears to work, in the desired direction. There is yet no evidence of the effect of such courses on accident involvement. Only, if the experiment is carried out in a larger scale will such studies become feasible.

Conclusions

What then can we learn from this? The following conclusions can, I believe, be drawn:

1. Driving performance measures do indicate that novice drivers are ill prepared and smooth/ error free performance is not achieved after formal driver training
2. Accident patterns are often incorrectly interpreted as evidence of risk-taking;
3. In the light of poor-performance data, accidents may well be explained as indications of inadequate skills;
4. Courses may be effective in raising awareness of risks, and are an essential part of the final phase of driver training.

Further developments

We can therefore concluded that we need the following:

- an approach or method directed at a safe choice of speeds;
- a training approach, as a result of which self-imposed task requirements are voluntarily brought in line with limited ability;
- a safe driving environment in which risky conditions in the initial years after obtaining a licence are reduced by:
 - restrictions e.g. night curfews
 - supervision: accompanied driving.

In conclusion, I would like to point out that we cannot blame the young for being inadequate, if we refuse them the means to become more adequate.

Literature

De Velde Harsenhorst, J.J. & Lourens, P.F. (1988). Het onderwijsleerproces bij een leerling-automobiliste en specifiek rijgedrag van jonge automobilisten. VK 88-25. Verkeerskundig Studiecentrum, R.U. Groningen, Haren, 1988.

De Velde Harsenhorst, J.J. & Lourens, P.F. (1989). Het onderwijsleerproces bij een leerling-automobiliste; Enkele extra analyses en eindverslag. VK 89-23. Verkeerskundig Studiecentrum, R.U. Groningen, Haren, 1989.

De Velde Harsenhorst, J.J. & Lourens, P.F. (1990). Rijtaakuitvoering van onervaren automobilisten: Een grondslagenonderzoek. VK 90-17. Verkeerskundig Studiecentrum, R.U. Groningen, Haren.

McDonald, W.A. (1985). The human factor in driving accidents: A review of their relationship. Department of Transport, Federal Office of Road Safety, Canberra, 1985.

Milech, D.; Glencross, D. & Hartley, L. (1989). Skills acquisition by young drivers: Perceiving, interpreting and responding to the driver environment. Report MR 4. Federal Office of Road Safety, Canberra, 1989.

Twisk, D.A.M. & Wittink, R.D. (1990). Aanvullende componenten van de basisopleiding; Nota bij het onderzoek ten behoeve van een procesevaluatie van een cursus van jonge, beginnende automobilisten uitgevoerd door Traffic Test bv te Veenendaal. R-90-12. SWOV, Leidschendam, 1990.

Van Kampen, L.T.B. (1988). Analyse van de verkeersonveiligheid van jonge onervaren automobilisten; Een probleemanalyse. R-88-45. SWOV, Leidschendam, 1988.

Vissers, J.A.M.M. (1990). Aanvullende componenten voor de basisopleiding; Een praktijkbeproeving; Deel II: Productevaluatie. Traffic Test bv, Veenendaal, 1990.

Wittink, R.D. & Twisk, D.A.M. (1990). Een cursus voor beginnende automobilisten in aanvulling op de rijopleiding; Een experiment om het gedrag beter af te stemmen op veiligheidseisen en gebrek aan ervaring. R-90-33. SWOV, Leidschendam, 1990.