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Learning to Drive: The Evidence

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EXECUTIVE SUMMARY

In 2007, the Department for Transport announced that a fundamental overhaul of how people learn to drive was required in order to address key gaps in driver training and testing and to improve safety on British roads. In response to this, the Driving Standards Agency (DSA) produced a summary of proposals in their consultation: **Learning to Drive**. This report sets out the evidence on why there is a need to transform the training and testing of drivers, illustrating the Department for Transport and the Driving Standards Agency's assessment of the current problem.

The evidence has been grouped into three key (but related) issues:

- issues with **how** people are learning to drive;
- weaknesses in **what** people learn during driver training and testing; and
- the **ability**, **attitudes** and **behaviours** of new drivers.

Requirements for the training and testing of drivers in Britain

In contrast to some other countries (for example, Denmark and Germany), there is no compulsory theoretical or practical driver training for those wanting to drive in Britain. In Britain the driving test represents that main tool for *inducing* learner drivers to build up training and experience before passing the test and driving independently; ultimately, the test influences how people learn to drive. At present, there is huge variation in how people prepare for the driving tests and future driving.

In Britain, the driving test was established in 1935. Changes to vehicles, traffic levels and road designs that have taken place subsequently represent major changes to the *skills* that have to be demonstrated in order to pass the driving test and to drive safely. As a result of the changing driving environment, some adjustments have been made to the driving test; however, these changes have really represented *tweaks* to the driver testing system rather than significant differences. The evidence presented in this report suggests that these changes have not been sufficient to ensure that all new drivers are trained and tested in a manner to prepare them for a safe and competent driving career.

Learning to drive and preparation for the driving tests

Learning to drive is not undertaken in an effective, integrated or systematic way

There is evidence that learners are not effectively engaging with the current training and testing system. They have an unstructured approach to learning to drive, which divorces the theory and the practice: a number of learners study for the theory test in

isolation rather than adopting an integrated approach to their learning; others demonstrate an over reliance upon instructors; monitoring progress appears to be inadequate for learners; and many learners are not complementing professional training with informal practice to increase their total driving experience prior to testing. These patterns are not ideal, especially since more driving experience (either through more lessons or practice) prior to testing is widely accepted by road safety researchers and practitioners to result in a number of benefits, including improved safety.

Many learners lack a clear understanding of what is involved in becoming a safe and competent driver, and are presenting for the practical test unprepared with poor driving ability

Many driving test candidates apply for the test before they have sufficient competence in the requisite skills because they believe that they have some probability of passing. As a result, there are low pass rates and candidates do not pass for serious and dangerous driving behaviour in test conditions. The latest data from the DSA show that the national pass rate for the practical test is only 44% (Road Safety Information System (RSIS) database 2007/08). Furthermore, a sizeable proportion demonstrates that they are nowhere near test standard. Among those who do not pass the test, few recognise their own role in the outcome, preferring instead to blame external factors.

Weaknesses in the education, training and testing of drivers

Education and training

Although there is considerable flexibility regarding the manner in which learner drivers learn to drive, current arrangements for their training, including what is taught and how, do not provide them with the right skills and experience to be safe drivers. For example, risky behaviours which can lead to accidents are not being sufficiently addressed through driver education; learner drivers are not currently being educated about attitude and motivation, which represent key road safety issues for drivers; and various training tools and schemes need to be improved to achieve their full potential.

Testing

In terms of testing, there are issues about the coverage and validity of the practical test: it does not assess key components of the driving task which are necessary for safe and competent independent driving. These aspects include independent driving skills, self-evaluation, and recognising and dealing with the effects which personal and journey-related factors can have on driving safety, including speed choice.

Perversely, people who find it easiest to pass the test tend to be those who will go on to have a high accident rate. While the accident liability of new drivers is high immediately after the test, it falls sharply as they gain post-test experience, which shows that they still have a lot to learn after passing the test. Many people believe that passing the practical test does not make you a safe driver.

The ability, attitudes and behaviours of new drivers

Some new drivers have a poor understanding of good driving

The way some drivers think about driving represents a significant problem which needs to be addressed: some young drivers have a poor conceptualisation of good driving; for others, learning to drive is thought to inevitably involve accidents, while others demonstrate little awareness that driving involves the shared use of space on the roads; and some new drivers believe that they really learn to drive after passing the practical test.

New drivers have significant gaps in driving experience or ability when they qualify for a licence

New drivers are expected to be safe and competent drivers, but many pass the practical test without having been exposed to a wide range of driving conditions or without being consistent in their driving ability. From a road safety perspective, it is worrying that one in twenty (5%) respondents who passed the test had no experience on country roads, given that a high proportion of casualties occur on rural roads. One in eight (12%) respondents who actually passed their practical test admitted that they had no experience at all of driving in darkness.

Although new drivers emerge from the practical test with high levels of confidence in their driving ability, they can identify gaps in their skills but seek no further training

For many new drivers, initial confidence in their ability to drive, which is validated by passing the test, starts to wane when they realise the complexity of the driving task and diversity of the situations they will encounter on the roads. After passing the test new drivers can identify their weaknesses, but few resort to further training: only one in five (22%) respondents in the Cohort II study (Wells et al., 2008) took any form of further instruction or training in the first year after passing their practical driving test.

Young and new drivers exhibit a range of unsafe driving attitudes and behaviour

Some young and new drivers exhibit speeding behaviour, they admit to drink-driving and driving after taking drugs, and believe that that their peers' driving is

unsafe. They are generally over-represented in the proportion of accidents involving contributory factors which are attributable to the driver.

Many young and new drivers are involved in road accidents and they are over-represented in road casualty statistics

Many young and new drivers are involved in near misses and road accidents – a number of these result in casualties. The Government's road safety strategy has been less effective in reducing death and injury among young drivers than other groups. In 2006, 145 young car drivers aged 17 to 19 were killed compared with an average of 125 in 1994–98. Young drivers are over-represented in road casualties. Car drivers aged 17 to 19 account for approximately 2% of the total driving population represent 12% of all car drivers who were killed and seriously injured, and 14% of all driver deaths in Britain. Finally, as a result of high accident rates, young and new drivers have relatively high insurance premiums.

Key conclusions

The evidence suggests that the reform of driver training and testing has both learning and testing challenges.

The learning challenges

- The right quantity and type of driving experience.
- Systematic learning around explicit goals and ownership of those goals.
- Creating a culture of lifelong learning and driver development.

The testing challenge

- Creating an overall driving test that gives a more realistic and rounded assessment of whether someone is fit to drive alone.

1 INTRODUCTION

In February 2007, the Department for Transport published a review of the Government's Road Safety Strategy, Tomorrow's Roads – Safer for Everyone*. It announced that a fundamental overhaul of how people learn to drive was required in order to address key gaps in driver training and testing and to improve safety on British roads. Proposals for how to do this are presented in the Driving Standards Agency's (DSA)* Learning to Drive *consultation (DSA, 2008a). This report, which complements the consultation, sets out the evidence for why there is a need to transform driver training and testing.*

The evidence in this report suggests that there fundamental weaknesses with the learning to drive process and how people learn to drive. As a result, many new drivers are ill prepared for safe driving when they pass their practical test and start to drive independently. The evidence has been grouped into three key (but related) issues which reflect the structure of this report:

- issues with **how** people are learning to drive – for example, learning is carried out inefficiently;
- gaps in **what** people learn during driver training and testing – for example, the driving test focuses too narrowly on vehicle control; and,
- the **ability**, **attitudes** and **behaviours** of new drivers – for example, new drivers are overconfident and overestimate their own ability; they view the practical test as the end point of the formal learning process.

This report has been prepared by the Department for Transport, with the Driving Standards Agency, to illustrate our assessment of the problem. It does not represent a systematic review of all the evidence on driver education, training and testing.

The report also focuses solely on learning to drive for **car** drivers rather the drivers of other vehicles.

1.1 Why do people drive?

There are many different reasons to drive and to learn to drive (see Department for Transport, 2006a). For many young people, learning to drive represents a significant event in the transition to adulthood. It can bring independence and flexibility but also increased access to opportunities for education, employment and leisure (Cartmel and Furlong, 2000). Drivers are also vital to many kinds of business and public services. Many people in rural areas regard being able to drive as a necessity (Derek Halden Consultancy, 2003; Martin et al., 2004). For example, in one survey, one in nine (11%) car drivers claimed that they could not use alternative transport modes for any of their journeys (Stradling, 2005; cited in Department for Transport,

2006a). Another survey found that two-fifths (41%) of the car journeys reported by adults could not have been made by public transport (Barker and Connolly, 2005; cited in Department for Transport, 2006a). The desire to drive is widespread, to that extent that children aspire to be drivers when they get older (Kingham and Donohoe, 2002).

1.2 What are the experiences of the new driver?

Over three-quarters of a million people acquired a licence to drive on Britain's roads in 2006/07, marking a shift in their status from accompanied learner drivers to independent, newly qualified drivers.

Box 1.1: Definitions

The terms 'young', 'new', 'newly qualified' and 'novice' drivers are prevalent in the literature. Their use and definitions vary, and they have often been used interchangeably.

The term '**new driver**' will be used in this document and, unless stated otherwise, refers to a driver who has had a full licence for two or three years. Not all new drivers are young drivers, although all young drivers under 19 years of age are relatively inexperienced and therefore new drivers. Many new drivers are from older age groups; however, half (50%) of drivers who passed the test in 2006/07 were 17 to 19 years old; a quarter (25%) were aged 25 or over (Road Safety Information System (RSIS) database, 2006/07).[1]

1.2.1 Driving behaviour and involvement in accidents

Once they have passed the practical test new drivers (see Box 1.1 for definition) tend to drive **frequently**. The recently published Cohort II study (Wells et al., 2008)[2] found that around four out of five respondents (79%) reported driving on four or more days per week within six months of passing the test. Data from the National Travel Survey from 2002–06 indicate that drivers with a licence for up to three years, on average, take 12 car trips per week and drive over 4,700 miles each year.[3]

Unfortunately, many new drivers are likely to be involved in an accident within a few years of passing the driving test. One in five (19%) drivers reported having an accident in the first six months after passing the test, while seven in ten (70%) reported having a 'near accident' in the same time period (Wells et al., 2008). The number of reported casualty accidents involving young drivers is higher today than

1 Refer to Notes section for more information on this data source.

2 Refer to Notes section for more information on this data source.

3 This data has been specially extracted from the 2006 National Travel Survey. Refer to Notes section for more information on the data.

in 1994–98. Based on 2006 data, it has been estimated that over 300 inexperienced and new drivers and their passengers were killed on Britain's roads, representing around one in five car deaths (DSA, 2008b).

The causes of accidents and of poor driving are complex; however, research has identified a number of factors which are associated with such a high accident risk for young and new drivers. These factors include age and driving experience (which is explained in more detail in Box 1.2.), overconfidence in their own driving ability, underestimation of risk, poor hazard perception, poor attitudes to driving, gender, peer pressure, parental influence (see, for example, reviews in Baughan et al., 2005a; ECMT, 2006; Parker and Stradling, 2001; RoSPA, 2002; Waylen and McKenna, 2002). Detailed analysis of road accidents involving young drivers found that driving errors and unsafe behaviour contributed to accidents; for example, loss of control, being careless, reckless or in a hurry, travelling too fast for the conditions, managing slippery roads, speeding, drink-driving and aggressive driving. In some cases, these factors represent a lack of skill or poor decision-making, but it also reflects that some drivers actually **choose** to drive in a dangerous manner.

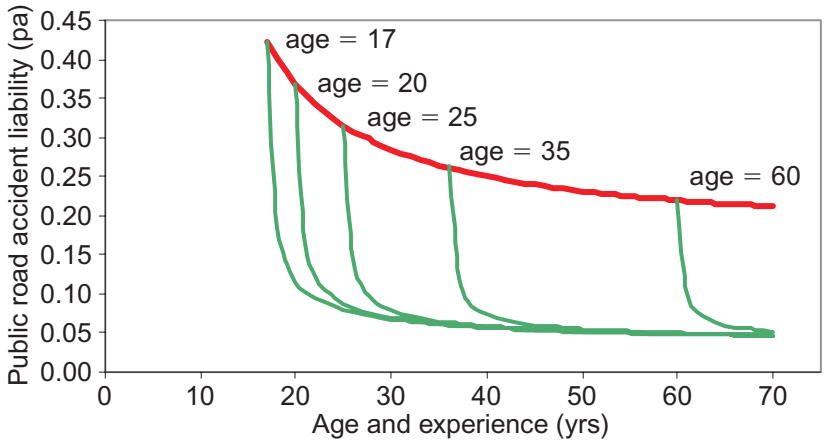
Box 1.2: How does age and experience influence the accident rates of new drivers?

In 2007, the Transport Select Committee asked to what extent novice (new) drivers are more at risk of being involved in a collision than other drivers, and whether this is primarily a consequence of age, inexperience or a combination of both (see House of Commons, 2007a and 2007b). Research in a number of countries shows that accident liability can be affected by both age and experience, and that the risk of being involved in a road traffic accident within the first year of driving **decreases substantially** as a result of maturation (i.e. increased age) and more driving experience (for example, ECMT, 2006; Wells et al., 2008). This means that while the accident risk for all new drivers is considerable, the risk is lower the older a new driver is. This relationship is illustrated in Figure 1.1, which shows that the effect of experience is stronger than the effects of age.

The sex of the driver is an important factor. Wells et al. (2008) found that male respondents reported more public road accidents than female respondents at 6, 12, 24 and 36 months after passing the test. Statistical modelling shows that accident liability changed more sharply with the age of passing the test for male drivers than for female drivers – after controlling for the effects of differences in driving exposure. For very low levels of exposure, or for those who passed their test after the age of 22, the accident liability for females was estimated to be higher than that for males.

During the first six months of independent driving after passing the practical test, the accident liability of drivers decreased sharply (see Maycock et al., 1991,

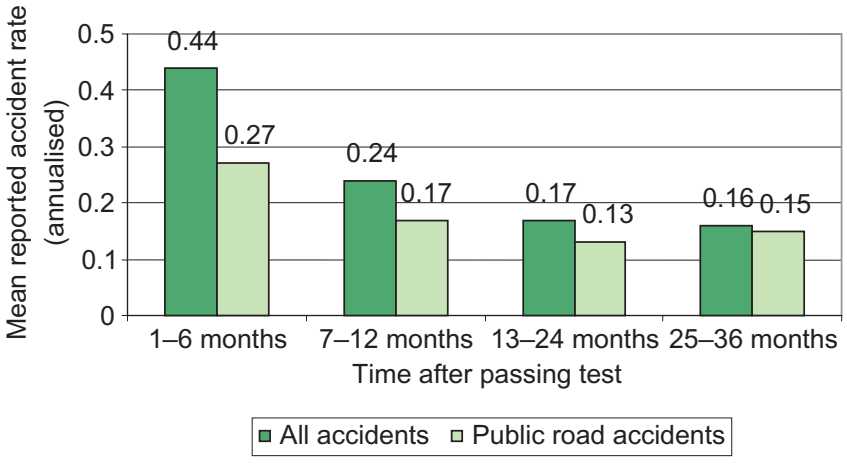
Figure 1.1: The effects of age (maturation) and experience on accident liability



Note, these data are presented for respondents with an average of 7,500 miles per annum.
(Source: unpublished data from Cohort II (Wells et al., 2008))

2002; Wells et al., 2008). The likelihood of having any accident fell for respondents to Cohort II by approximately 45% between the first and second six-month periods after passing the test; for reported accidents specifically on public roads, the rate fell by 37% over the same period (Figure 1.2) (Wells et al., 2008).

Figure 1.2: Reported accident rate for all and public road accidents by period after passing the practical test



(Source: Cohort II (Wells et al., 2008))

This evidence suggests that the **age of a driver is a less significant factor** in accidents involving new drivers than the amount of driving experience, and drivers of all ages are particularly at risk during the six months after passing the test.

A number of new drivers emerge from the training and testing system **insufficiently prepared** for the driving tasks they face. Although those who pass the practical test today have more hours of driving experience under their belts than 20 years ago, this increase in experience is not reflected by any major improvement in the pass rate or in the accident rate of young drivers over this time period. Many qualify with little or no exposure to some typical driving conditions; many have not reached a consistent standard of driving. They have driven well enough to pass the test, but might very well fail another test if they were to take it. While confidence in their driving ability is initially high, they can identify gaps in their driving ability and skills. Yet, only a small proportion of new drivers take further training after passing their test to improve their driving, sometimes even in spite of incentives.

1.2.2 Attitudes and understanding

The value attached to passing the test is not as high as it could be among new drivers: in a recent poll, the majority of drivers with a licence for up to three years agreed that passing the test does not make you a safe driver (Angle et al., 2007). Some think that passing the driving test is not even based on driving ability. Furthermore, many young drivers have opted out of the licensing system in Britain altogether and are driving illegally without a licence.

Qualitative research indicates that some young and new drivers have a poor understanding of good driving; they understand emotional[4] and physical[5] aspects, but tend to be less aware of social etiquette in the use of shared road space. Some think that they learn 'real driving' **after** passing the practical test, and that the test is merely a barrier to doing this. In this context, it appears that a number of new drivers expect to teach themselves how to drive in an unsupervised and ad-hoc fashion, learning from mistakes. They regard road accidents as a **normal** part of the post-test learning process and young drivers readily agree that the driving of their peers is unsafe. There is, however, little evidence on the prevalence of these views.

1.3 What are the problems with the learning, training and testing of drivers?

In addition to high accident levels, there are a number of indications that the way in which learner drivers are educated and trained to drive is failing to provide them with the necessary knowledge, skills and competencies to be safe, competent and responsible independent drivers. There are problems, for example, with how people are learning to drive. Many learners appear to have an unstructured and poorly integrated approach to learning to drive. They lack experience of driving in certain conditions, particularly driving in darkness and on country roads. They do not use progress documentation to structure and monitor their learning; they are poor at

4 Driving as an emotional activity is about preserving an appropriate frame of mind to drive well in the face of distractions and annoyances (Christmas, 2007: p. 4).

5 Driving as a physical activity is about safely controlling and guiding the vehicle, a physical object, through a complex physical environment (Christmas, 2007).

assessing their own readiness and ability to drive safety. Many do not complement professional training with informal practice, which more closely reflects independent driving. They attempt the practical test when they feel that they have a moderate probability of passing. When presenting for the test learner drivers are able to identify significant gaps in their driving skills. Many demonstrate such poor driving ability that they make serious or dangerous faults under test conditions and ultimately do not pass the test. It also appears that learners do not take responsibility for their own learning, relying heavily upon driving instructors and often blaming external factors for unsuccessful practical test results.

There are also fundamental weaknesses in current arrangements in preparing new drivers for safe, responsible driving on the roads. In terms of education and training, attitude and motivation, and certain forms of risky behaviour, which represent key safety issues for drivers, are not being sufficiently addressed. Although hazard perception testing among learners seems to have delivered some safety benefits, it may not have achieved its full potential. To date, there is limited evidence on the effectiveness of the schemes and products designed to aid learning to drive and improve the safety of new drivers. While the limited evidence available suggests that the opportunity for systematic driver record-keeping might not have been effective in influencing the driving experience of learners prior to taking the practical test, although there has been no robust evaluation of these effects. Similarly, the only available evidence to date on learning schemes targeted at pre-drivers and those for new drivers appears to have limited safety benefits.

In terms of testing, there are issues about the coverage and validity of the practical test: it does not assess key components of the driving task which are necessary for safe and competent independent driving and, perversely, people who find it easiest to pass the test tend to be those who will go on to have a high accident rate.

Ultimately, for many, the approach to learning to drive, described in this section, is **unstructured** and **incomplete**. The learning, training and testing of drivers therefore has the potential to be substantially improved to benefit the learner, the new driver, road users and wider society.

1.4 Structure of this report

Chapter 2 presents an overview of the requirements for training and testing. **Chapter 3** presents evidence on how people in Britain learn to drive and prepare for the driving test. **Chapter 4** looks at how some basic attitudes, behaviour and skills, which are thought to lead to increased risks for new drivers are being neglected in current training and testing arrangements. **Chapter 5** puts the need for effective driver training in the wider context by focusing on the behaviour and experiences of new drivers. **Chapter 6** outlines key conclusions and the policy response to this evidence.

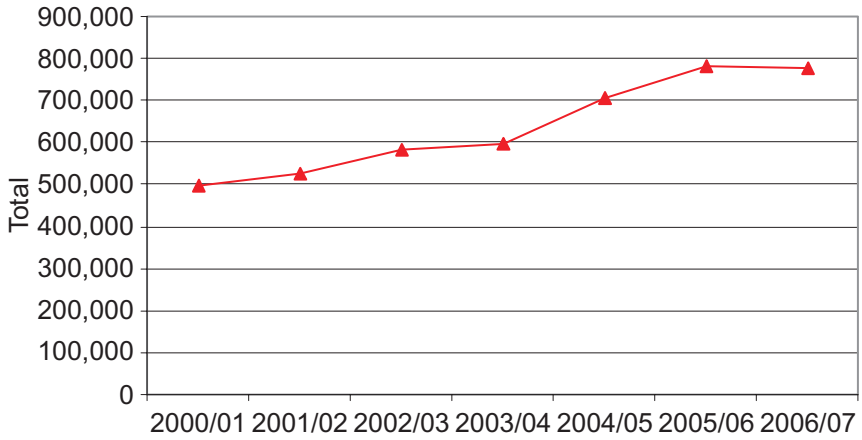
2 REQUIREMENTS FOR THE TRAINING AND TESTING OF DRIVERS IN BRITAIN

This chapter sets out evidence on trends in driver training and testing. It also describes the system within which people currently learn to drive in Britain.

2.1 Introduction

Road traffic in Great Britain has grown by 84% since 1980. Latest estimates from the National Travel Survey (2006) suggest that there are 33.7 million driving licence holders (DfT, 2007c: p. 22) and that three in four households have access to a car (ONS, 2007). In general, there has been a steady increase in the absolute number of newly qualified drivers on the roads since 2000/01 – although 2006/07 saw a small relative fall (Figure 2.1).

Figure 2.1: Trends in the number of newly qualified drivers by year, from 2000/01 to 2006/07

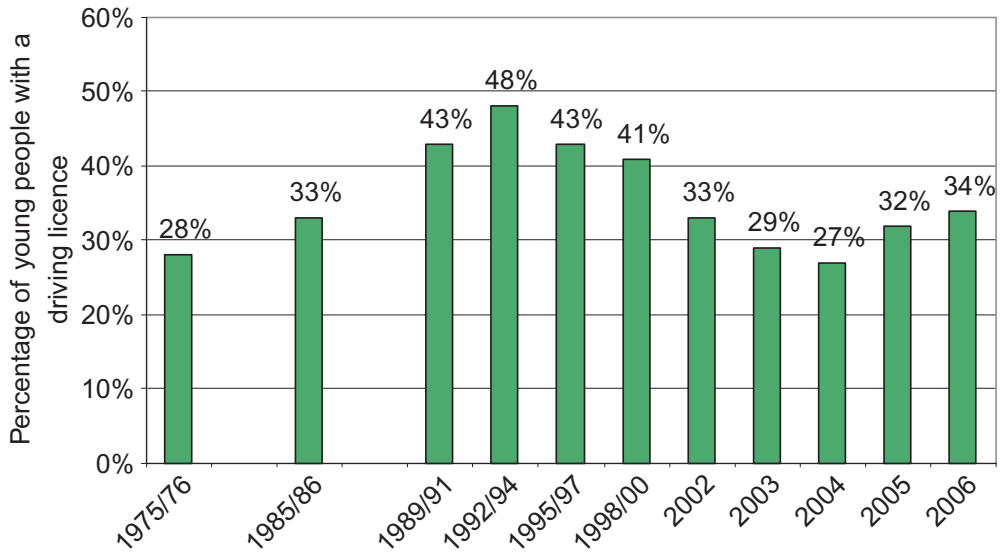


(Source: RSIS 2006/07)

From 1995/97 to 2006 there was a decline in the proportion young people holding a driving licence: those with a licence aged 17 to 20 years fell from 43% to 34% over this period (Figure 2.2). Possible reasons for this decline are thought to include:

- the cost of lessons, insurance and buying a car;
- the increasing difficulty of passing the driving test (including the theory test introduced in 1996); and,
- the fact that more young people are students and unable to afford cars and the associated costs (DfT, 2007c: p. 23).

Figure 2.2: Trends in the proportion of young people (aged 17 to 20 years) who have a driving licence, 1975/76 to 2006



(Source: Data from the National Travel Survey, 1975/76 to 2006)

2.2 Overview of how people learn to drive

All learners must acquire a provisional driving licence, which permits them to learn to drive, subject to certain restrictions.[6] The minimum age to drive a car in Britain is 17 years, although it is possible to apply for a provisional licence from the Driver and Vehicle Licensing Agency (DVLA) up to two months beforehand. Full licences are also available to people aged 16 if they are in receipt of a Higher Mobility Allowance or if they are learning to drive a tractor or a moped. In 2006/07, just over half of all provisional licences (55%) were issued to 16 and 17 year olds (DVLA, unpublished data). Minimum requirements for driver licensing are set out in European Commission Directives.

In Britain the driving test represents the main tool for inducing learner drivers to build up training and experience before passing the test and driving independently; ultimately, the test induces how people learn to drive (Baughan et al., 2005a). In contrast to some other countries, there is no compulsory theoretical or practical driver training for those wanting to drive in Britain (see Boxes 2.1 and 2.2).

6 The restrictions include the following: learners have to be accompanied by an experienced driver; they must display 'L'-plates (or 'D'-plates in Wales); and they must not drive on motorways. These restrictions are lifted when learners pass their driving test and acquire a full licence.

Box 2.1: Requirements of theoretical and practical driver *training* in Britain

Learners in Britain have the freedom to choose the means by which they prepare for their tests, with **no mandatory theoretical or practical training**. Informal training is permitted through accompanied driving practice. There is no minimum amount of driving experience required, no minimum learning period and no post-test restrictions. However, learners in Britain generally have considerably more practical driving experience than is prescribed in countries with a set minimum (see ECMT, 2006).

There is huge **variation** in how people learn to drive and prepare for driving tests. Research found that different types of learner chose different learning strategies. Less able pupils learned to drive effectively with professional instructors, characterised as a consistent and slower experience, rich in instruction and feedback; more able pupils benefited more from the greater variety, higher speed, and reduced instruction and feedback that characterise informal driving practice (Groeger and Brady, 2004). This would suggest that different learners will inevitably benefit from varying amounts of formal and informal training and practice, and a single approach to teaching and supporting learners will not be as effective as a tailored regime which takes account of the learner's individual aptitude and their preferred learning styles.

The Cohort II study (Wells et al., 2008) provides the most recent 'snapshot' of how people learn to drive in Britain. Some key findings are presented in Box 2.2.

Box 2.2: Findings about learning to drive (2001–05)

- Virtually all learners (99%) took some form of professional instruction.
- On average, learners took 52 hours[7] of professional lessons prior to their practical test, although this varied by age and sex.
- Approximately half of learners (55%) had practice sessions with friends or relatives, for an average of 24 hours
- Nearly all learners (99.5%) used some kind of material to prepare for the multiple-choice part of the theory test; 96% used material to prepare for the hazard perception test, but a fifth of respondents (22%) did not use any form of learning material to prepare for the practical test.
- The average learning time to taking the practical test was 14 months; generally males learnt to drive in less time than females, and younger people learnt in less time than older people.

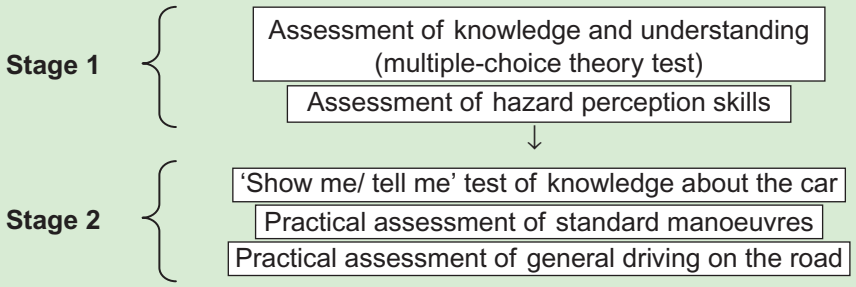
(Source: Based on respondents to the Cohort II study (Wells et al., 2008))

7 On average, respondents who *passed* the practical test had 47 hours of professional instruction.

2.3 Overview of the driving test

Many people focus on the final practical assessment of driving, however the testing processes actually consists of **six parts** in two stages (Box 2.3).

Box 2.3: The full driving test



These six components enable a judgement to be made about the **suitability** of a candidate's driving based on a snapshot of driving behaviour: it can only test how well the candidate deals with the challenges encountered during a specific period. In particular, the practical driving test, representing the last stage of the process, attempts to screen out drivers who pose an **unacceptable threat** to themselves or to others and who fail to meet a minimum standard (see Baughan et al. (2005a) for a review of the British practical test).

2.4 History of driver testing in Britain

In recent years, there have been a number of changes to the driving test in Britain since it was first introduced. These changes reflect the changing environment in which drivers need to operate safely, and changes in European legislation on driver testing standards.

2.4.1 The practical test

The driving test was established in 1935, as road deaths rose in tandem with increased traffic. The practical test then was broadly similar to the practical test today, including a turn in the road, a reverse left, an emergency stop and a section of 'general driving'. However, changes to vehicles, traffic levels and road designs that have taken place since 1935 constitute major changes to the skills which candidates need to demonstrate in the practical test. Although there have been some adjustments to the test to reflect the modern driving environment, for example arm signals have been phased out and reverse parking has been included, such changes have really represented **'tweaks'** to the driver testing system in Britain. Since 1935, a total of 92 million driving tests have taken place (RSIS data).

In addition, the Driving Standards Agency (DSA) introduced a number of changes to the practical test in 1999 with the aim of providing a more accurate assessment which better reflected the modern road environment (see Box 2.4).

Box 2.4: Recent changes to the practical driving test

The most recent changes to the practical test were introduced in 1999. These comprised the following:

- the test duration was increased by about seven minutes to about 40 minutes;
- coverage of test routes was extended so that more routes would include higher-speed dual- and single-carriageway roads;
- changes to the testing of the emergency stop and reversing manoeuvres (whereby not all manoeuvres were necessarily tested in every test)[8] also yielded three to five minutes more time for free driving;
- all less serious faults (driver faults) were recorded and an upper limit of 15 placed on candidates in order to pass the test; and
- candidates were to be given a written explanation of the test report at the end of the test.

A further change to the driving test was introduced in 2003 to comply with Commission Directive 2000/56/EC, which introduced a new minimum standard for driver testing. This required the inclusion of vehicle safety checks and is dealt with via a brief oral examination at the start of the driving test during which two questions from a possible 24 are asked, and the candidate is required to tell or demonstrate how the safety checks would be undertaken.

Forthcoming changes

From September 2008, examiners will also assess and provide feedback on the candidate's ability to follow the principles of **'eco-safe'** driving during the practical test. European research suggests that this type of driving can lead to a 5–10% improvement in fuel economy, with attendant environmental benefits (CIECA, 2007). This assessment, however, *will not* contribute to the final test outcome.

The DSA also started providing **feedback** to candidates who did not pass the practical driving test from 1990. This was intended to provide greater transparency, and to give candidates of all types a clearer understanding of why they had not passed the test.

8 The changes involved one in three candidates (rather than all candidates) being asked to demonstrate an emergency stop. In addition, the reverse parking manoeuvre was now to be tested in the test centre car park where facilities were available, and two from three of the set manoeuvres (turning in the road, reverse parking and reversing around a corner), rather than all three, would be required in each test.

2.4.2 *The theory test*

In 1996, the DSA introduced the theory test, which replaced questions at the end of the test on the *Highway Code*, in order to comply with European Law.[9] It was intended to ensure that drivers had a proper knowledge of a range of driving theory, including traffic regulations, driver behaviour and safe road use. The hazard perception component of the theory test was introduced in 2002 to bring about an improvement in learners' anticipation and scanning for potential hazards.

Despite these modifications to the testing regime – in both the practical and the theory tests – the evidence reviewed in this report suggests that these **changes have not been sufficient** to ensure that all learner drivers are trained and tested in a manner to prepare them for a safe and competent driving career.

2.5 Performance at the driving test

Pass rates vary for different parts of the driving test. Pass rates for the practical driving test vary, over time and by the demographics characteristics of candidates. Data on the performance of test candidates are presented in Box 2.5. These data are based on the latest available data for a full year.

Box 2.5: Statistics about the driving test (2006/07)

Theory and hazard perception tests

- The pass rate for the car theory test, including the hazard perception component, was 68%.
- 1.8 million practical car driving tests were carried out in 2006/07.

Eyesight test

- In 2006/07, approximately 1,000 candidates were unable to successfully complete the eyesight test.

Practical test (including manoeuvres)

- Nationally, in 2006/07, 43% of candidates passed the practical test on their first attempt.
- On average it took 2.3 attempts for successful candidates to pass the practical test.
- On average, successful candidates committed six driving faults; unsuccessful candidates, on average, committed nine driving faults and two serious faults.
- The most common manoeuvre tested was the turn in the road, with approximately 1.25 million carried out in 2006/07.

(Source: RSIS 2006/07)

9 European Directive 91/439/EC.

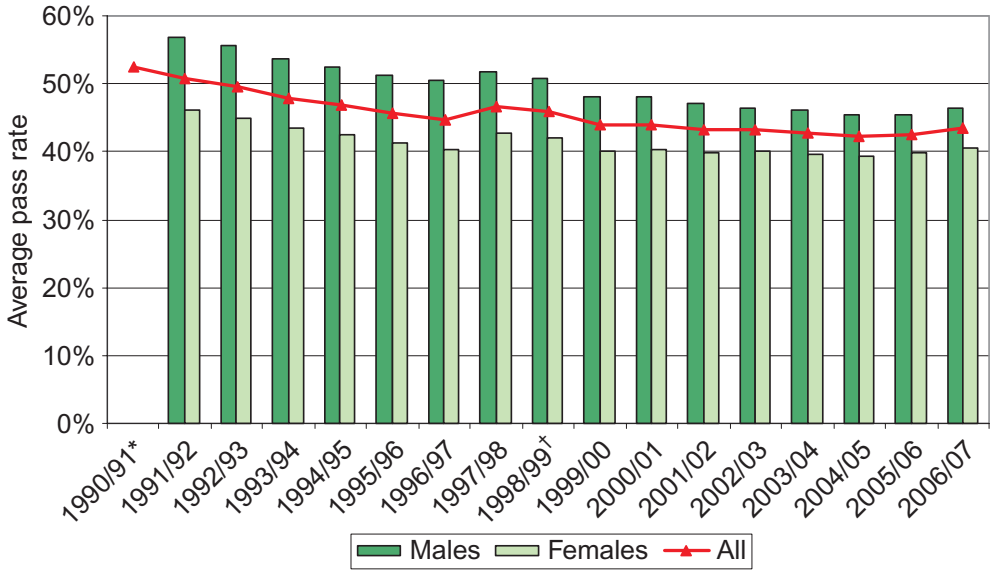
There are however, notable **variations in pass rates** for the practical test by age and sex.

2.5.1 *Variations in the pass rate by sex*

Males tend to have higher pass rates for the practical test than females. In 2006/07 the pass rate for males was 46% compared with 41% for females – a difference of six percentage points, when rounded to the nearest whole percentage.[10] However, the difference in pass rate by sex has nearly halved since 1991/92, from eleven percentage points to six percentage points for 2006/07.

Figure 2.3 illustrates how the pass rates for the practical test have changed over time and also by sex, since 1990/91.

Figure 2.3: Trends in the national pass rate for the practical car test, by sex, 1990/91 to 2006/07



* Data on the pass rate by sex are not available for 1990/91.
† This year represents changes to the practical driving test (see Box 2.2).
(Source: RSIS 2006/07)

2.5.2 *Variations in the pass rate by age*

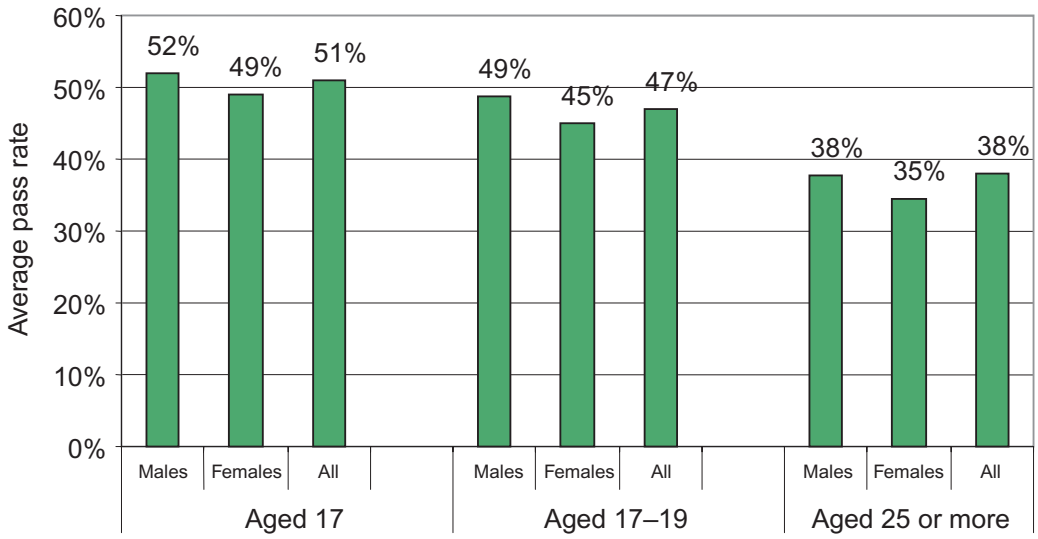
National data on pass rates show that younger candidates have markedly higher pass rates compared with older candidates; the pass rates decline with the age at which people take the test. In 2006/07, for example, the pass rate for 17-year-olds was 51% compared with the national average of 43%; for those aged 17 to 19 years, the pass rate was 47% compared with 38% for those aged 25 or over.

10 These percentages are subject to rounding errors.

2.5.3 *Variations in pass rate by age and sex*

Overall, young males have the highest pass rates: 49% of young males aged 17 to 19 years who attempted the practical car test passed compared with 45% of females of the same age. By comparison, the pass rates for males and for females aged 25 or over were 38% and 35% respectively. These rates are illustrated in Figure 2.4.

Figure 2.4: Examples of pass rates for the practical car test by age and sex, 2006/07



(Source: RSIS 2006/07)

A number of factors are associated with higher pass rates. These are discussed in more detail in Wells et al. (2008).

3 LEARNING TO DRIVE AND PREPARATION FOR THE DRIVING TESTS

*This chapter highlights a number of problems with **how** learners approach learning to drive. The learning strategies are not simply about the choices of learner drivers but also reflect the set up of the current training and testing regime. Ineffective learning processes and attempting the test with a moderate probability of passing means that some people will pass the test before they have reached a consistent standard of driving, and others will incur the associated costs of re-testing.*

3.1 Introduction

Learning to drive is a considerable investment. It is estimated that the average cost of learning to drive is around £1,350 to £1,800,[11] depending on whether private practice is taken. Learners have the autonomy to **choose** how to structure their training to best suit their own needs and circumstances. Learners can also decide when to apply for the practical test. Many present for the practical test when they think they have a moderate probability of passing rather than when they are fully competent in driving. For many, this results in unsuccessful test outcomes, and requires additional time and resources to be spent re-testing. In order to get the maximum benefit from any professional training and accompanied driving practice, it is important that learners have a clear understanding of their own skills, what is required of them to pass the test, and what is necessary to be a safe and competent driver.

3.2 Learning to drive is not undertaken in an effective, integrated or systematic way

The evidence suggests that learners are not effectively engaging with the current training and testing system. Their approach to learning is unstructured, which divorces the theory and the practice: some learners study for the theory test in isolation rather than adopting an integrated approach; others demonstrate an over-reliance upon instructors; progress monitoring appears to be inadequate; and, many

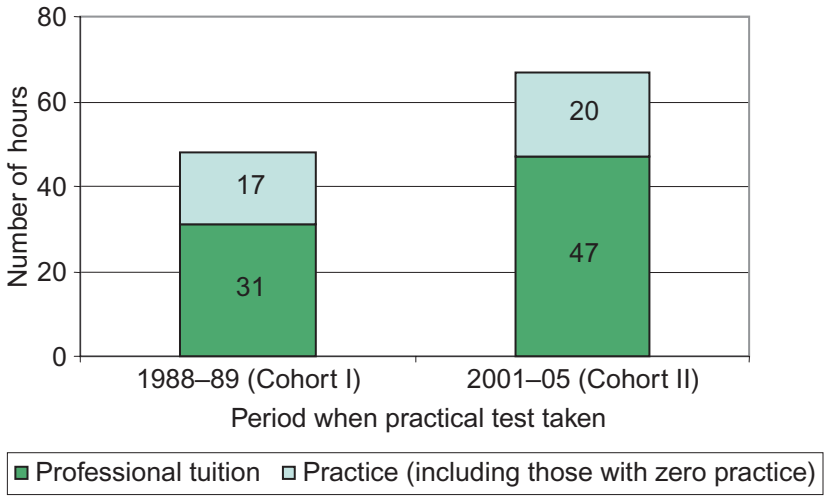
11 Provisional licence: £45; average number of professional lessons: 52 x £21; average number of theory test attempts: 1.45 attempts x £28.50; average number of practical tests: 2.26 attempts x £49.50; cost of renting an instructor's car for the test (if taking lessons only): 2.26 attempts x £21. It is assumed that those who do private practice will have access to a car for the practical test and therefore will not bear the costs of using an instructor's car for the test. On average, those who take practice spend 34 hours with an accompanying driver other than an instructor. Assuming fuel and vehicle costs per mile (total 18.3p/mile), 30 miles per hour of practice (34 hours x £0.183 x 30 mph of practice) and the cost of extra insurance (estimated at approximately £300 for the relevant period). Overall, this gives a total cost of £1,358 for those taking lessons only and £1,797 for those taking lessons and practice.

learners do not complement professional training with informal driving practice to increase their driving experience. Such patterns are not ideal, especially since more driving experience (either through more lessons or practice) is widely accepted by road safety researchers and practitioners to result in a number of benefits, including improved safety (see ECMT, 2006).

3.2.1 *Candidates who pass the test have more hours of driving prior to the test now than 20 years ago, although this is not reflected by an improvement in the pass rate, or the casualty rate for young drivers*

A study of those taking practical tests in 1988–89 (Cohort I; Forsyth, 1992a and 1992b) found that respondents who passed the test had a mean of 48 hours of **total driving experience** (including tuition and practice). The equivalent figure for respondents to the Cohort II study, who passed a practical test from 2001 to 2005, was **67** hours. Figure 3.1 shows that most of this increase in total driving hours for those who passed the test is accounted for by an increase in the number of hours of professional driving instruction (from 31 hours to 47 hours).

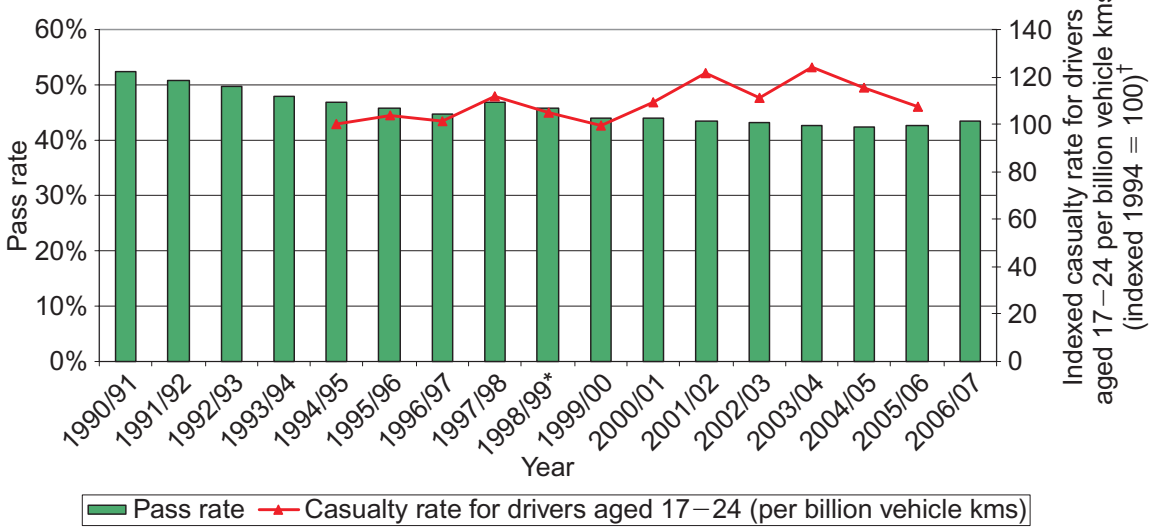
Figure 3.1: Mean reported number of hours of driving experience (tuition and practice) for those who *passed* the practical test, 1988–89 and 2001–05



Note, the mean number of hours of practice is averaged across those who had none.
(Sources: Cohort I (Forsyth, 1992a); Cohort II (Wells et al., 2008))

There are concerns however, that this increase in the amount of professional instruction has not resulted in improved pass rates or road safety. Since the early 1990s – around the time of the first Cohort study of learner and novice drivers (Forsyth 1992a and 1992b) – pass rates for the practical test have decreased by about ten percentage points and, from the mid-1990s, little progress has been made in reducing the casualty rates for young car drivers (Figure 3.2).

Figure 3.2: Trends in national pass rates and casualty rates for car drivers aged 17–24 years per billion kilometres driven



* Represents changes to the driving test (see Box 2.2).
† Owing to changes in the measurement of driving exposure in the National Travel Survey, it is not possible to present casualty rates for young drivers prior to 1994.
(Sources: unpublished data from RSIS, STATS19, National Travel Survey)

In this context however, it is also important to recognise that the many things that affect driving have also changed over the last 20 years. Despite the trends identified in Figure 3.2, we cannot be certain what the pass rates or casualty rates would have been **in the absence** of increased instruction. It may be that the increase in instruction has been necessary to help candidates keep pace with changes in driving, technology, road conditions and the modifications to the test.

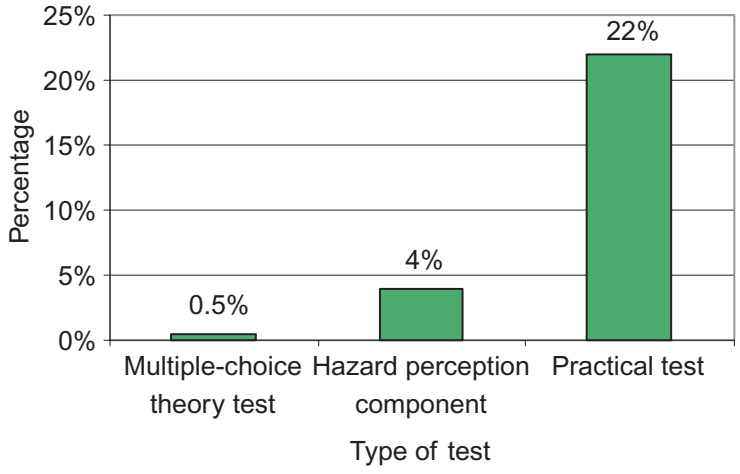
3.2.2 *For some learners, the theoretical and practical elements of learning to drive are not being integrated well*

It is widely recognised that approved driving instructors (ADIs) have a critical role in relating theory to practical experience. More than nine in ten (93%) respondents in the Cohort II study who had professional lessons prior to taking the theory test stated that they had received preparatory support for the test from their driving instructor. For some learners, however, the theoretical and practical elements of learning to driver are not well integrated. One in ten (10%) respondents had not had **any professional tuition** *prior* to the theory test (Wells et al., 2008). Evidence suggests that hazard perception training is most effective once learners have at least some experience of real driving (for example, Grayson and Sexton 2002). The purpose of the hazard perception training and testing after all is to improve hazard awareness in learner drivers and not simply for them to pass the hazard perception test for the sake of it.

For the group of learners who pass the hazard perception test without any driving experience, there are questions about the extent to which their theory and knowledge are integrated with practical driving experience. It emphasises the need for approved driving instructors (ADIs) to ensure that the topics covered in the theory test, including safe driving, are effectively taught and reinforced in subsequent practical lessons. Hazard perception is discussed further in Section 4.2.3.

It is clear that nearly all learner drivers used some form of study aid when preparing for the multiple-choice component and the hazard perception component of the theory test (99.5% and 96%, respectively). However, around a fifth (22%) of respondents chose not to use **any materials** to help them in preparation for the practical test. Nearly half (48%) of all respondents did not use the *Highway Code* to prepare for the practical test (Figure 3.3). The last statistic is perhaps surprising, as the *Highway Code* represents the rules of the road, and its interpretation in test conditions represents part of the basis upon which the learners' driving is assessed. It is worth noting however, that the some of these learners could have accessed relevant information from the *Highway Code* through other publications. It is Interesting however, that the majority (78%) of learners who attempted the practical test did actually use some form of reference material in preparation.

Figure 3.3: Proportion of respondents who did not use any learning materials to prepare for different tests



(Source: Cohort II (Wells et al., 2008))

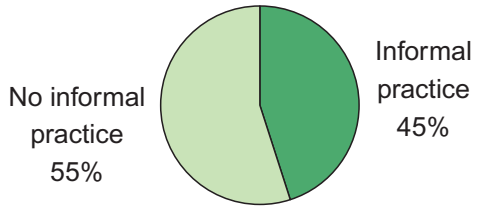
In addition, there are of course, a number of possible reasons why learners do not refer to supporting materials prior to their test. For example, only a third (33%) of respondents in the Cohort II study said their driving instructor had actually recommended any study materials to help prepare for the practical driving test. Anecdotal evidence from practitioners and in qualitative research (Christmas, 2007) suggests that learners simply want to get the theoretical aspect of the driving test 'out of the way' and do not regard the application of theory into practical skills as an

ongoing and necessary part of the learning process. Wells et al. (2008) state that 'it is . . . possible that both learners and their instructors view the theory test as a separate hurdle to deal with rather than part of the whole integrated learning experience' (p. 74).

3.2.3 *Many learners do not complement professional training with informal practice, which could benefit their driving*

Nearly half (45%) of the respondents in the Cohort II study **did not** do any accompanied driving practice prior to taking the practical test (Figure 3.4). Increasing the amount of driving experience gained before passing the driving test can be an effective way of reducing accidents among new drivers (Gregersen et al., 2000). Wells et al. (2008) found that having **informal practice** was associated with higher pass rates. Informal practice can also be a cost-effective way of increasing the hours of driving experience and complementing formal training. Many learners are therefore not accruing the benefits of extending their driving experience in this way.

Figure 3.4: Proportion of learners taking informal driving practice before the practical test



(Source: Cohort II (Wells et al., 2008))

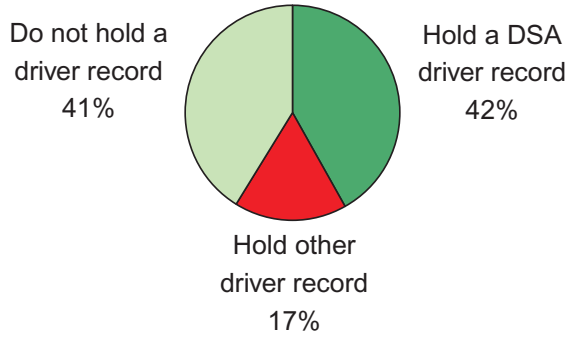
For some, there are likely to be issues of access to informal practice, for example, because of the availability of a suitably qualified accompanying driver or associated insurance costs. However, it is possible that measures to encourage learners to accumulate more informal practice before taking the practical test may well prove beneficial (Wells et al., 2008).

3.2.4 *Many learners are not using any form of progress documentation to structure and monitor their learning*

In order to help learners to structure and monitor their training and development of driving skills, the Driving Standards Agency (DSA) introduced a **Driver Record**. This document sets out 24 key skills and provides a record of the driver's degree of independence of the instructor. From July 2003, the DSA Driver Record has been routinely sent out with provisional licences. Yet, many learners appear not to be using any form of progress monitoring, to self-assess and direct their learning. For

example, the Cohort II study, four out of ten (41%) respondents reported not **having any** form of driver record (see Figure 3.5).[12]

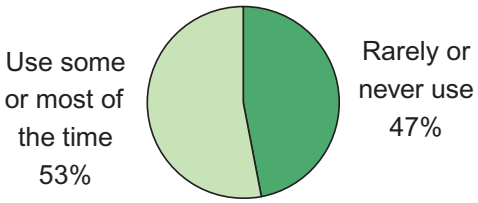
Figure 3.5: Proportion of respondents who had a driver record



Note, 5% of respondents held a DSA Driver Record and a non-DSA driver record. These respondents are included in the category 'Hold a DSA Driver Record'.
(Source: Cohort II (Wells et al., 2008))

Even fewer respondents reported **using** a driver record. Of all respondents in the Cohort II study, only 15% reported using one, irrespective of how frequently. Among those with a DSA Driver Record (that is, 42% of total sample),[13] nearly half (47%) of these never or rarely used it (Figure 3.6). In fact, almost a third (31%) reported **never** using the DSA Driver Record when learning to drive. However, given that use of a driver record is voluntary, it was not possible to determine, using the Cohort II study, whether training would be improved by the consistent use of such a document. There was however no indication of any differences in the driving experiences of respondents who reported using a driver record and those who did not (Wells et al., 2008: p. 61).

Figure 3.6: Proportion of those with a DSA Driver Record that use it



Note, these respondents represent 42% of the total sample (see Figure 3.5).
(Source: Cohort II (Wells et al., 2008))

12 The Cohort II study started in 2001, so some of the early respondents will not have routinely received a DSA Driver Record. It is likely therefore that the percentages presented underestimate possession of a Driver Record.

13 Those who held both a DSA Driver Record and another form of driver record were included in the 'Hold a DSA Driver Record' group.

A Customer Insight survey by the DSA found that two-thirds (67%) of the approved driving instructors (ADIs) interviewed tended to use their **own version** of progress monitoring, and one in ten (9%) did not use any at all (DSA, 2007, unpublished data).

3.2.5 Learners take limited ownership of the process of learning to drive

Forthcoming research (Lang et al., forthcoming) on the use of driver records and other forms of progress documentation for learning to drive found that learners often do not give much thought to the coverage or structure of their lessons with ADIs. Interviews with learners at different stages of the learning process indicated that often they had an **over-reliance upon their instructors** (Lang et al., forthcoming). Learners tended to use some form of progress monitoring **only** if it was introduced to them by an ADI, who also tended to take responsibility for monitoring progress and the retention of the document:

> 'I suppose they [learner drivers] leave it in the hands of their instructor to monitor their progress but I think they probably should be more aware of what they need to improve as well.' (Male, learning for three months, 16 lessons; cited in Lang et al., forthcoming.)

This suggests that learner drivers need to be encouraged to take greater responsibility and ownership for their own learning, assessment of driving skills and outcomes. This evidence and that presented in Section 3.2.4 suggests that there is the potential to improve progress monitoring and the self-assessment of skills of learners.

3.3 Many learners lack a clear understanding of what is involved in becoming a safe and competent driver, and are presenting for the practical test unprepared with poor driving ability

Many people apply for the practical test before they have sufficient competence in the requisite skills because they believe that they have some probability of passing. For many, such an approach results in failure at the test. Some of these candidates fail for serious and dangerous driving in test conditions; while a sizeable proportion demonstrates that they are nowhere near test standard. Among those who fail to pass the practical test, few recognise their own role in the outcome, preferring instead to blame external factors.

3.3.1 Candidates take practical tests despite knowing that they have only a moderate probability of passing

Qualitative research with a small sample of learners by Baughan et al. (2005a) indicated that learners tend to apply for the practical test at the time when they feel ready but are aware that they have only a **moderate probability of passing**. They are likely to think that there is not much point in delaying the test in order to have more lessons and practice because they are not convinced that this will much improve the likelihood of passing. This raises issues about:

- how best to persuade learners to accumulate more training and driving experience before presenting for the practical test;
- how effective extra training would be in improving pass rates; and
- whether training and testing could be improved so that candidates experience a greater benefit from preparing well for the test.

3.3.2 More than half of the people who take the practical test do not actually pass, indicating that they are not ready for safe independent driving

The latest data from the DSA show that the national pass rate for the practical test is 44% (RSIS 2007/08).[14] Such a low pass rate (i.e. you are more likely to fail the test than to pass) suggests that the majority of people are coming forward for the practical test without having achieved the required levels of competence; they are not ready for safe independent driving. The low pass rate also raises questions about the extent to which the test requirements and standards are understood by learners, and even some instructors and raises concerns about the impact such a high proportion of unsuccessful candidates has on the efficiency of the testing system.

3.3.3 Nearly all those who fail the practical test do so because they demonstrate serious faults or dangerous driving behaviour

In order to pass the practical driving test, candidates must not commit **any** serious or dangerous faults.[15] In addition, 16 or more errors of a less serious nature (called 'driving faults')[16] will prevent a driver from passing the test. From the evidence presented already, we know that many people – over half – fail the practical test.

14 This does not represent data for the full 12 months of 2007/08, but the latest available.

15 Dangerous driving faults are faults that results in actual danger; serious driving faults are when a potentially dangerous incident occurs, when the candidate reveals a recurring driving fault or fails to perform a manoeuvre, such as parallel parking, bay parking, reversing into a side road, turn in the road, or they emergency stop, correctly.

16 Driving faults are less serious faults, such as hesitating too long at a junction, and which do not place the candidate in danger. A candidate who makes 16 or more minor driving faults does not pass the practical test.

However, nearly all (99.9%) of those who fail do so because they have committed serious and/or dangerous faults (i.e. exhibiting behaviour which indicates that they are unsafe to drive independently). Candidates who fail the practical test are most likely to acquire a serious or dangerous fault at junctions – two-thirds (67%) of these faults relate to poor observation (RSIS 2006/07).

3.3.4 *The driving of many test candidates is nowhere near the pass standard*

Indeed, some candidates performed so badly in the practical test in 2006/07 that the examiner had to **physically intervene**, for example, using the dual controls, where available, or taking hold of the steering wheel. Such action occurred in a one in five (19%) of all unsuccessful tests; examiners also had to take verbal action in 16% of unsuccessful tests (RSIS 2006/07). This evidence demonstrates that a notable proportion of those taking the test are **nowhere near a safe enough standard** to drive independently.

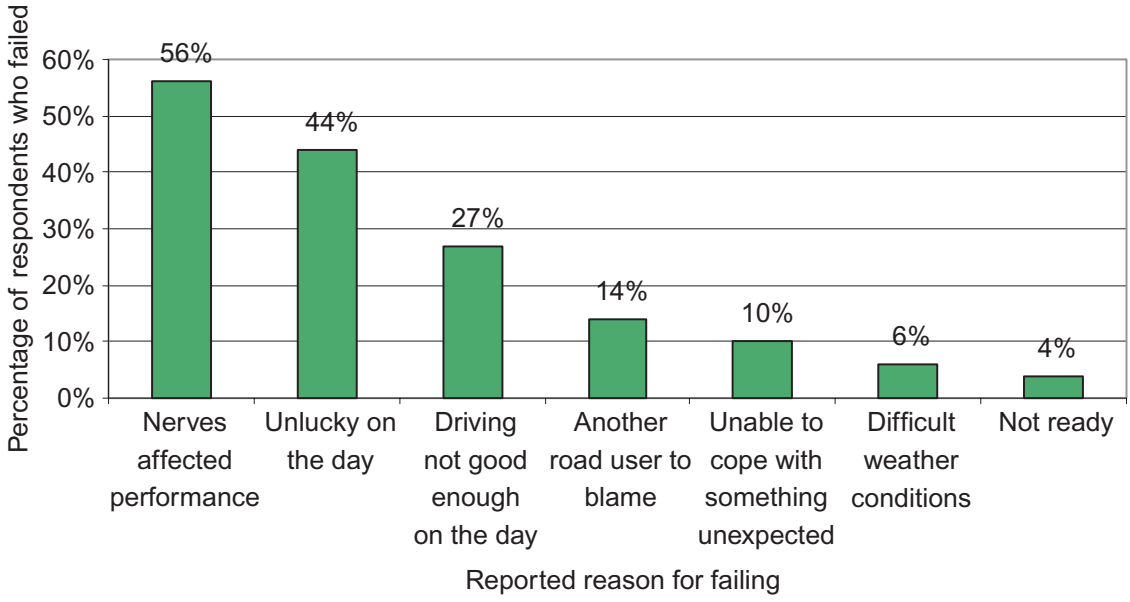
3.3.5 *Many people who fail the practical test blame 'external' factors rather than their driving ability*

Research found that a number of people who fail the practical test attribute it to factors such as poor luck in the conditions or events met during the test, test nerves, and the perceived idiosyncrasies of the examiner (Baughan et al., 2005a). Qualitative research with young drivers found that some erroneously believed that examiners had quotas. The Cohort II study found that nearly seven out of ten (69%) respondents who failed the practical test agreed with the examiner's decision. In 2007/08, nine out of ten (86%) test candidates responding to a DSA survey agreed that examiners' feedback helped them to understand the outcome of their test (DSA, 2007, unpublished data).

In spite of such a positive response to examiner feedback, many unsuccessful test candidates in the Cohort II study blamed factors that were **beyond their control** for their failure, rather than their driving ability (Figure 3.7). For example, around half (56%) claimed that they were too nervous to perform to the required standard or attributed their performance to poor luck (44%). One in ten (10%) reported that they were unable to cope with something unexpected during the test – hardly the sign of a safe and competent driver; while around one in eight (14%) actually blamed other road users!

It is of concern that people who do not pass the test do not acknowledge their lack of driving skills or ability because this probably means that they are unlikely to develop and improve their driving ability before presenting for subsequent tests. It is also not clear exactly how those who fail the practical test prepare for re-taking it, whether the feedback they receive from their performance in the test informs their subsequent preparation, and the driving instructor's role in this process. On a more

Figure 3.7: Reasons which respondents gave for failing the practical test



(Source: Cohort II (Wells et al., 2008))

positive note, just over a quarter (27%) of those who failed were able to acknowledge that their driving was simply not good enough on the day of the test and one in twenty (4%) claimed that they were not ready for the practical test, thereby acknowledging their own role in the outcome (Wells et al., 2008).

3.4 Summary

Learning to drive is not undertaken in an effective, integrated or systematic way

- Candidates have more hours of driving experience prior to the test now than 20 years ago but this is not reflected by an improvement in the pass rate, or the casualty rate for young drivers.
- For some, theoretical and practical elements of learning to drive are not being integrated well.
- Many learners do not complement professional training with informal practice which could benefit their driving.
- Many learners are not using any form of progress documentation to structure and monitor their learning.
- Learners take limited ownership of the process of learning to drive.

Many learners lack a clear understanding of what is involved in becoming a safe and competent driver, and are presenting for the practical test unprepared with poor driving ability

- Candidates take practical tests despite knowing that they have only a moderate probability of passing.
- More than half of the people who take the practical test do not pass, indicating that they are not ready for safe independent driving.
- Nearly all those who fail the practical test do so because they demonstrate serious faults or dangerous driving behaviour.
- The driving of many test candidates is nowhere near the pass standard.
- Many people who fail the practical test blame ‘external’ factors rather than their driving ability.

4 WEAKNESSES IN THE EDUCATION, TRAINING AND TESTING OF DRIVERS

This chapter presents evidence that there are significant gaps in the training and testing of drivers, which suggests that the current system in certain instances in not equipping new drivers with the necessary knowledge, skills and experience to be safe, responsible and competent drivers. The various parts of the driving test are the main tool for inducing learner drivers to develop competencies to a satisfactory level and accumulate training and experience. This chapter focuses on ***what*** *drivers are learning, or perhaps, failing to learn.*

4.1 Introduction

The circumstances contributing to road accidents have been the subject of a number of research reports (for example, Broughton and Buckle 2007; Ward et al., 2007; Clarke et al., 2007). Many studies have focused on the accidents involving young drivers; less, however is known about accidents involving new drivers. Given such a high proportion of new drivers are also young drivers (see Box 1.1) underlying factors behind crashes are important driver training and education. There is evidence to suggest that many of these accidents relate to attitudinal factors.

Currently driver training and testing system in Britain does not attempt to tackle the attitudinal and motivational influences on how people drive. Instead, the training culture focuses on mastering vehicle handling and control, and interacting safely with traffic – competencies which are then assessed in the practical test. Learners in turn, concentrate on acquiring these basic driving skills in order to pass the test. The driving test ultimately influences what and how people learn to drive.

4.2 Issues with education and training

Although there is considerable flexibility regarding the manner in which people learn to drive, current arrangements for their training, including what is taught and how, do not provide them with the right knowledge, attitudes, skills and experience to be good, safe drivers.

4.2.1 Some risky behaviour, attributable to the driver, which can lead to accidents is not sufficiently addressed through education

Young drivers are subject to a combination of emotional and physical immaturity, personality and gender-factors, the lifestyles and social norms associated with youth, emotions, distractions, alongside the challenge of learning to drive, which puts them at greater risk (ECMT, 2006). Research suggests that **driver error or reactions** are a common factor in road accidents (this is discussed further in Section

5.5.4). Box 4.1 outlines the factors in the literature which have been found to contribute to crashes involving young drivers in particular, but which are not currently addressed through driver education or training.

Box 4.1: Factors which contribute to road accidents involving young drivers

Young drivers are over-represented in nearly all types of road accident. However, they are particularly at risk from accidents that involve:

- alcohol and drugs;
- recklessness;
- speed;
- single-vehicle accidents and bends;
- rear-end shunts;
- loss of control;
- turning across oncoming traffic and right turns;
- 'looked but did not see';
- hours of darkness; and
- fatigue, the presence of passengers (distraction) and the non-use of seat belts.

Maycock (2002) also estimated that on non-built-up roads, young drivers tended to have a higher accident risk per unit of driving time compared with older drivers. On motorways, however, the risk for young drivers tended to be lower than for older drivers.

(Source: ECMT, 2006; Clarke et al., 2002; Maycock, 2002)

These factors or behaviours are strongly linked to drivers' attitudes. They are not simply errors reflecting a lack of skill; they have a strong component in which the driver **chooses to behave in a dangerous manner**. Studies have found that it is these types of behaviours, rather than driving errors that tend to be most strongly predictive of accidents (for example, Lester, 1991; Forsyth, 1992b; Clarke et al., 2002; Wells et al., 2008). Further detail about the relationship between attitudes, values, motives and accidents can be found in Fuller et al. (2008, in press), with particular focus on the conditions for inappropriate high speed.

Clarke et al. (2002) also identified the top three countermeasures for drivers most at fault in specific accident types that need to be integrated into driver training in order to help teach learners how to drive appropriately in circumstances that are known to

contribute to road accidents (see Table 4.1). As you can see, these countermeasures simply represent good driving practice.

Table 4.1: Top three countermeasures for drivers most at fault by four accident types

Accident type	Top three countermeasures for drivers most at fault	
Right turning	1 2 3	Ensure foreground is checked properly with a sweeping gaze Stop at junctions especially if the view is in doubt Re-check to the right (first point of danger) before pulling out
Rear-end shunts	1 2 3	Keep a safe stopping distance from the vehicle in front Avoid distraction Look ahead of vehicle in front for any hazards that might cause it to slow/ stop
Rural bend	1 2 3	Ensure appropriate speed for bend severity Ensure appropriate speed/distance in adverse weather Avoid breaking while travelling around a bend: finish braking before entry
Darkness	1 2 3	Ensure appropriate speed for bend severity Ensure appropriate speed/distance in adverse weather Ensure foreground is checked properly with a sweeping gaze

(Source: Clarke et al., 2002)

4.2.2 Although attitude and motivation are key road safety issues for drivers, learners are not educated to develop safe and responsible attitudes towards the use of shared road space

A hierarchical framework of goals for driver education, which describes the driving task by behavioural level, has been developed (see Table 4.2). It is known as the 'GDE Matrix' (Hatakka et al., 2002). This approach is regarded by many European experts as a valuable summary of the factors which affect the safety of new drivers, and should therefore influence training (ECMT, 2006).

The Matrix proposes that in order to create safer drivers, it is essential to focus on the higher levels which have the greatest influence on the sort of driving situations that drivers will most likely encounter. Traditional driver training and testing in Britain **concentrates on vehicle control and traffic skills** – representing Levels 1 and 2. However, there is growing realisation that such basic skills are insufficient for safety on the roads and that what matters is the way in which drivers make use of their skills during everyday driving. Effective driver training should encourage an understanding of personal risk and prevention strategies, including personal attitudes, goals and motives (Levels 3 and 4).

Although some pre-driver initiatives in Britain cover knowledge of lifestyle and social factors (Levels 3 and 4) which might impact on driver safety, and some attitudinal issues are covered in the theory test question bank, the higher level goals

Table 4.2: **Goals for driver education (GDE Matrix)**				
		Knowledge and skills	**Risk-increasing factors**	**Self-evaluation**
Level 4	Goals for life and skills for living	Understanding the importance of lifestyle, age group, cultural and social circumstances, etc.	Understanding the importance of sensation-seeking, risk acceptance, group norms, peer pressure, etc.	Understanding the importance of introspection, competence, personal preconditions for safe driving, impulse control, etc.
Level 3	Goals for, and context of driving	Understanding the importance of modal choice, time of day, motives for driving, route-planning, etc.	Understanding the impact of alcohol, fatigue, low friction, risk hour traffic, peer-age passengers, etc.	Understanding the importance of personal motives, self-critical thinking, etc.
Level 2	Mastery of traffic situations	Mastering traffic riles, hazard perception etc. Automating elements of the driving process. Cooperating with other drivers, etc.	Understanding the risks associated with disobeying rules, close-following, low friction, vulnerable road users, etc.	Calibration of driving skills, developing a personal driving style, etc.
Level 1	Vehicle control	Mastering vehicle functioning, protective systems, vehicle control etc. Understanding the impact of physical laws	Understanding the risks associated with non-use of seat belts, breakdown of vehicle systems, worn out tyres, etc.	Calibration of car control skills
Note, the upper levels determine how drivers use the lower-level skills. (Source: ECMT, 2006: p. 129, adapted from Hatakka et al., 2003)				

are generally not addressed through driver training and education. Learner and new drivers are not taught to think about the risk factors relevant to them personally, to facilitate the self-assessment of the associated risk, and to develop of personal strategies for keeping themselves, and their passengers, safe. One way to promote the take-up of such factors into driver training would be to also incorporate them in the driving test. Suggestions for how to do this are explored in the TEST project (Baughan et al., 2005b). Other European countries, for example, the Netherlands and Sweden, are exploring bringing such factors into their driver testing (see DSA, 2008a). Norway was the first country to introduce a national curriculum based on the GDE Matrix (ECMT, 2006).

The second three-year review of the Government's road safety strategy (DfT, 2007a) stated that Britain needed to develop its own competence framework, a comprehensive analysis of the driving task. This was expected to incorporate ideas such as the GDE Matrix, and to mirror the standards used in education and the voluntary training sector. However, further research is needed on the how to effectively use the GDE Matrix **in practice** in order to develop driver training and testing.

4.2.3 Hazard perception training and testing may not have achieved its full safety potential

The hazard perception component of the theory test was introduced in Britain in 2002. Training materials were developed with the DSA to be used both by and with approved driving instructors (ADIs); interactive training products were intended to be used as an **integrated** part of learning to drive to complement practical training in the car (DSA, 2001). The introduction of the hazard perception test was based on strong evidence that experienced drivers had better hazard perception skills than new, inexperienced drivers. The evidence also showed that hazard perception skills were related to accident propensity and these skills were amenable to training (Grayson and Sexton, 2002). Recent research indicates that hazard perception training and testing has had **some safety benefits**; the hazard perception component of the theory test was associated with reductions in new drivers' accident liability. Furthermore, people who scored highly on the hazard perception test tended to have a lower accident liability than people who passed with lower scores (see Wells et al., 2008).

Research on the effectiveness of hazard perception training supports the need for an integrated approach: for example, hazard perception training **in conjunction with on-road training** was found to be particularly effective in improving hazard perception skills and responses of learner drivers (Mills et al., 1998), and training involving group discussions was also valuable (Grayson and Sexton, 2002). However, the majority of learners prepare for the hazard perception test by themselves using interactive media; some even take and pass the hazard perception test without having any practical driving experience (see Section 3.2.2).

Given that there is some evidence that hazard perception training is not being used as intended and some safety benefits have been accrued in spite of this, it does tend to suggest that the full potential benefits of improving people's hazard perception skills may not currently be realised. Future efforts to improve the way in which hazard perception training is approached and integrated, into training, by both learners and instructors (ADIs) are likely to be rewarded by greater reductions in reported accidents.

4.2.4 Current driver records appear to be a tool for instructors to record learners' progress rather than an effective aid for those learning to drive

Although the Cohort II study did not systematically evaluate the use of driver records, it found that the use of a driver record (discussed in Sections 3.2.4 and 3.2.5) **did not appear to influence learners' driving experience** prior to testing. There were no significant differences in the mileage, hours of tuition, amount of driving practice or even the amount of exposure to different driving conditions between those who used a driver record and those who did not (Wells et al., 2008).

These findings, however, do not tell us what the users' pre-test experience would have been had they not chosen to use the driver record. Research by Lang et al. (forthcoming) suggests that the current **format** of the Driver Record might represent a tool for instructors more than learner drivers (Lang et al., forthcoming).

Such evidence suggests that there may be scope for improving the content and use of progress monitoring documentation for learners. However, it is also possible that current forms of progress recording, such as driver records, are limited in how they actually influence learning, and that other measures may also be needed to aid those learning to drive.

4.2.5 Available evidence on current training products targeting pre-drivers and new drivers suggests that they have mixed or limited safety benefits

Learning to drive does not start when you acquire a provisional licence nor end when you pass the practical test. There is clear evidence that attitudes to driving are formed before the age at which people start learning to drive (see Deighton and Luther, 2007; ECMT, 2004). Unsuitable attitudes of pre-drivers towards, for example, speeding, driving style and the ease of the driving task, which are detrimental to safety, have been found to have a corresponding influence when pre-drivers become learners and, subsequently, new drivers. The link between attitudes, behaviour and accidents, discussed in Section 4.2.1, also shows the importance of addressing unsuitable attitudes early. Although some educational products exist for pre-drivers, there is little robust evidence evaluating the effectiveness of these products. Available evidence finds at best, mixed results (Deighton et al., 2007).

In terms of the effectiveness of **further training** for new drivers, the Association of British Insurers (ABI) has evaluated the Pass Plus scheme, and found that drivers who take Pass Plus have a marginally lower accident rate than drivers who do not participate in the scheme. However, the difference is relatively small and may not be statistically significant (ABI, 2006a). The evaluation was also limited as it failed to take into account driving experience and failed to adequately address the issue of self-selection of its participants (i.e. that Pass Plus simply attracts drivers who are already safer than the average). Ultimately, training products which have a positive and **demonstrable effect** on attitudes and behaviours need to be developed, evaluated and promoted among pre-drivers and new drivers.

4.3 Issues with testing

Given the relatively high levels of road safety in Britain, the driving test could be regarded as effective, in that it has helped to achieve a reasonably competent and comparatively safe driving population (Baughan et al., 2005a). There is evidence of good consistency between different examiners in assessing the performance of individual candidates; the test provides reasonable coverage of most of the basic

driving situations and skills, and the DSA has a well developed system for establishing and maintaining test standards. However, the fact that drivers' accident liability is high immediately after the test but falls sharply as they gain post-test driving experience shows that new drivers still have a lot to learn about safe driving (Baughan et al., 2005a).

4.3.1 *People who find it easiest to pass the current practical test tend to be those who will go on to have a high risk of accidents*

There is an apparently **perverse relationship** between pass rates and accident liability for certain groups: those with the highest pass rate – specifically, young males – are also most likely to be involved road traffic accidents after passing the test. There are concerns from a variety of sources, including researchers and road safety professionals, as well as insurance companies and employers, that the test is failing to assess important factors that **determine future accident risk** (i.e. factors that indicate the way in which new drivers go on to use the skills that are assessed in the test. As such, the test measures driver competence but not driver behaviour.

4.3.2 *The practical test does not assess the key components of the driving task which are regarded as necessary for safe and competent independent driving*

The demands placed on a new driver by the driving task immediately after passing the test clearly differ from those experienced during the learning process and in the test (Baughan, 2006). For example, these include:

- route choice, direction finding and decision making;
- dealing with distractions, such as in-car entertainment, and having to navigate; and
- dealing with the influences of passengers and other road users.

While we do not know to what extent lacking experience in these skills and experiences actually contributes towards road accidents involving new drivers, there is a close and well-documented association between factors such as inappropriate high speed and accidents (see Fuller et al., 2008). If the test is to be any measure of readiness for independent driving, and hence safety, current gaps such as speed choice, need to be **explicitly** addressed through driver education and by different parts of the driving test.

4.3.3 *The majority of new drivers believe that passing the test does not make you a safe driver*

Similarly, concerns about the validity of the driving test as a measure of safe driving are also reflected among new drivers. In 2007, the Department for Transport

commissioned a representative poll of around 2,000 people aged 15 or over, three-quarters (73%) of drivers with less than three years' driving experience agreed that passing the driving test does not make you a safe driver (Angle et al., 2007). This level of agreement was reflected by drivers with up to ten years driving experience.[17]

Interviews with a small sample of young drivers found that some drivers may think that they are ready to take the practical test, in terms of feeling reasonably competent to drive alone, however they are not very confident of passing it (Baughan et al., 2005a). Other research has indicated that some learners believe that passing the test is **no guarantee of competence** as a driver:

> 'A lot of people fluke their way through the test.' (Male, 24)

> 'I've talked to a lot of people who think they shouldn't have passed the test or you have friends who drive badly and you wonder how they passed. I know I shouldn't have passed: I cut across traffic and drove above a 30 mph speed limit.' (Female, 22) (cited in Christmas, 2007; p. 26)

> 'The test is just to legitimise the fact you can drive, but it doesn't mean you can drive well.' (Female, 17) (cited in Christmas, 2008)

These young drivers believed that you did not have to be a good, let alone safe, driver to pass the test. While, on the one hand, it is positive that these drivers are aware of the limitations of the test, it also raises questions about how they do then actually learn to drive safely once they have passed.

4.3.4 Too many people do not 'value' driving licences

One consequence of having a training and testing system which does not adequately address the needs of its users or induce the right kind of learning is that the value attached to having a driving licence is not as high as it could be among certain groups. Many young drivers have opted out of the licensing system in Britain. Although the exact number and extent of unlicensed drivers in Britain is not clear, Noble (2005) points out that several sources estimate that at least 100,000 young people may be driving without a licence.

There is a strong relationship between driving without a licence and being involved in a road accident. Knox et al. (2003a and 2003b) found that, in terms of the hours driven, younger male drivers (aged 17 to 29 years) are about three times more likely to be involved in a crash than all drivers, but **unlicensed** young male drivers are

17 Drivers with more than 10 years' driving were more likely to agree that passing the driving test does not make you a safe driver (approximately 82% agree compared with 73%).

even more so – between 3.25 and 11.6 times more likely than other drivers. Knox et al. (2003b) estimated that there are around 6,300 casualties annually as a result of crashes involving an unlicensed driver and one in seven of these (around 900 casualties) involve someone being killed or seriously injured. The Department for Transport has recently published a report exploring the reasons for unlicensed driving (Baker et al., 2008). It is important that the driver training and testing system should support and encourage young people to acquire a driving licence.

Anecdotal evidence from employers who require their staff to drive for work indicates that some do not value the driving licence as evidence of safe and competent driving. A number claim that they have to train their employees in the **basics** of good driving.

4.4 Summary

Issues with education and training

- Some risky behaviour which can lead to accidents is not sufficiently addressed through driver education.
- Attitude and motivation are key road safety issues for drivers but learners are not trained to develop safe and responsible attitudes towards the use of shared road space.
- Although hazard perception training and testing has had a safety benefit, it may not have achieved its full potential.
- Current driver records appear to be a tool for instructors to record learners' progress rather than an effective aid for those learning to drive.
- Available evidence on current training products targeting pre-drivers and new drivers suggests that they have mixed or limited safety benefits.

Issues with testing

- People who find it easiest to pass the current practical test tend to be those who will go on to have a high accident risk (challenging the validity of the test as a measure of driver safety).
- The practical test does not assess some key components of the driving task which are regarded as necessary for safe and competent independent driving.
- Many new drivers believe that passing the practical test does not make you a safe driver.
- Too many people do not 'value' driving licences.

5 THE ABILITY, ATTITUDES AND BEHAVIOURS OF NEW DRIVERS

*This chapter sets out the wider context behind why driver training and testing needs to be reformed – the **experiences** of new drivers when they emerge from the training and testing system. It provides detail on the ability of new drivers at the point when they pass the test and presents further information on how they perceive the driving test. Young and new drivers' perceptions of road safety are also outlined along with evidence of their behaviour and its consequences.*

5.1 Introduction

By their very nature new drivers are inexperienced when they first take to the roads. They have much to learn about driving despite having been recently trained and passed the complete driving test. In the face of this, there is a wealth of evidence that new drivers are not properly prepared for driving independently and safely.

5.2 Some new drivers have a poor understanding of good driving

The way in which some drivers think about driving represents a significant problem which needs to be addressed. Some young drivers have a poor conceptualisation of good driving. For others, learning to drive is thought to inevitably involve accidents, while others demonstrate little awareness that driving involves the shared use of space on the roads.

5.2.1 Young drivers are less aware of the social dimensions of driving which govern the shared use of the road

Focus group research with young drivers and with pre-drivers found that they defined good driving in physical and emotional terms, but rarely as a social activity within a shared space (Christmas, 2008). These drivers failed to recognise the social nature of driving and held unsafe attitudes towards driving. Some, for example, thought that emulating a confident and superior driving style was desirable, or 'good driving' which in turn was linked to the idea that other road users were 'objects' (often obstacles). Such definitions of good driving indicate that learners have a poor conceptualisation of road safety. It is however, not clear how prevalent these views are.

5.2.2 Some new drivers believe that they really learn to drive after passing the practical test

Research by Christmas (2007) found that young drivers believed that the kind of driving taught by approved driving instructors (ADIs) and which is ultimately assessed in the practical test does not correspond to the real requirements of 'good' driving:

> 'If you actually drive like they taught, you would be a hazard.' (Male, 20)

> 'You don't drive the way they teach you.' (Female, 21)

> 'My instructor taught me how to drive on the test and how to drive in the real world. Certain things are unwritten rules of driving.' (Female, 18) (cited in Christmas 2007: p. 25)

Some young drivers thought that it was only after passing the test that they really start to learn to drive – a process of learning from experience and from mistakes. They were not able to associate the official standards and rules for driving, which were practised (and demonstrated) in training with 'real world' driving. The driving they were taught did not reflect how they expected to drive after post-test. They therefore believed that new drivers start out their independent driving career by **teaching themselves how to drive properly** after acquiring their licence. This raises concerns about how they actually manage this chaotic post-test learning process.

The Driving Standards Agency's (DSA) literature on *Safe Driving for Life* advocates **continuous learning**: 'passing the test . . . [is] only the first step in learning to drive' (DSA, 2004). This assertion rests on the assumption that those who pass that test have the necessary attitudes, skills and behaviours for safe driving upon which to then review, develop and assess their driving skills and competencies. Further formal learning in this context might therefore include motorway lessons or advanced training.

5.2.3 Young drivers believe that accidents are a normal part of the learning after the test

Christmas (2007) found that there was widespread fatalism about the **inevitability of accidents** as part of the learning process. For confident young drivers, learning by experience meant learning through accidents and near-misses:

> 'Near-misses have an impact. I'm glad my young cousin's had an accident because he'll learn from it. It's like a rite of passage.' (Male, 25)

‘After the test I drove like a bit of a prat really. I passed first time; was a bit arrogant and thought I was a really good driver. I then had a crash. I thought I was excellent until I had the crash.’ (Male, 21)

‘I’ll learn my lesson one day.’ (Male, 17) (cited in Christmas, 2007: p. 30).

It is recognised that such views are inherently dangerous, and it not acceptable that new drivers expect to have accidents as a consequence of their driving and indeed, learning.

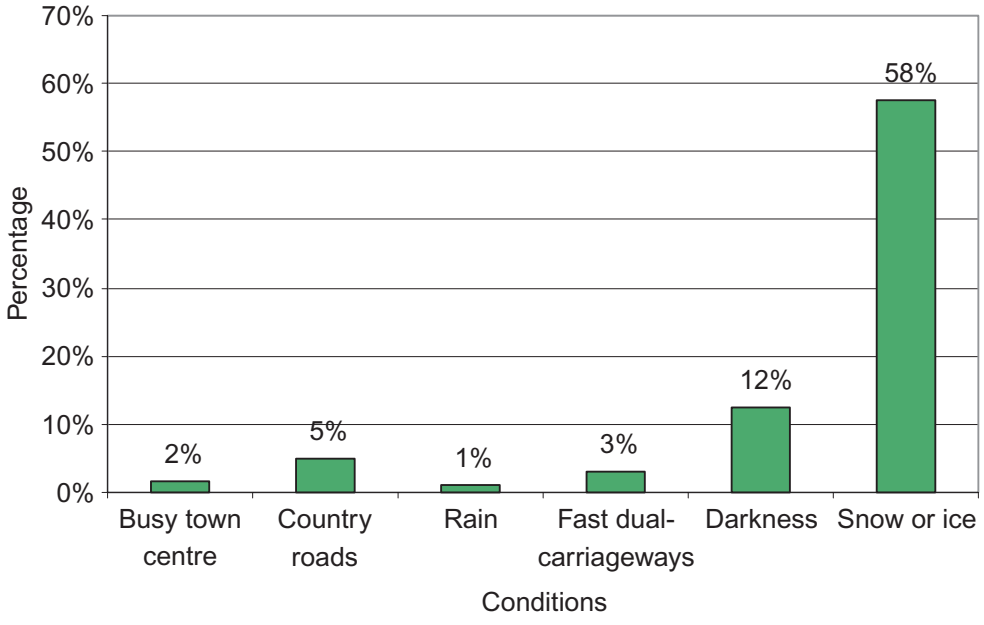
5.3 New drivers have significant gaps in driving experience or ability when they qualify for a full licence

New drivers are expected to be safe and competent drivers, but many pass the practical test without having been exposed to a wide range of driving conditions or without being consistent in their driving ability.

5.3.1 Too many new drivers qualify with little or no exposure to some typical driving conditions

Some of those who passed the practical test in the Cohort II study reported not having any experience in key aspects of driving (Figure 5.1). It is not surprising that some of those who passed do not have experience of driving in severe weather conditions, as it occurs relatively rarely in many parts of the country.

Figure 5.1: Proportion of all respondents who passed the driving test with no driving experience (tuition or practice) in certain conditions



Source: Cohort II (Wells et al., 2008))

From a road safety perspective, it is worrying that one in twenty (5%) respondents who passed the test had **no experience** on country roads, given that a high proportion of casualties occur on rural roads.[18] However, this figure might partly reflect where these new drivers lived and their access to such roads. This explanation can not be valid for the one in eight (12%) respondents who passed their practical test and admitted that they had no experience at all of driving in the dark. Such a finding is of concern as young drivers are at particular risk of accidents in the hours of darkness (see Box 4.1).

In his research with young drivers, Christmas (2007) found that they commonly believed that the learning experience **did not cover real enough situations**, such as motorway driving, night-time driving or even driving in multi-storey car parks:

> 'Motorways need to be covered. Lots of my mates are scared of motorways . . . I reckon it should be required.' (Males, 17)

> 'Motorway driving should be taught. My friend thought it was so easy until she did it. She was really scared in the dark, with no lights. I felt comfortable in the daytime, but not at night.' (Female, 23)

> 'Our ideal learning situation would focus on realistic situations, like going into a car park and going up the spiral. I remember the first time, thinking: do I go round in first? More realistic situations would be good, rather than tootling round the same old roads, and reversing round the corner.' (Female, 19) (cited in Christmas, 2007: p. 25)

5.3.2 Many of those who pass the test have not achieved a consistent standard

In one study where 366 people who had decided to book a practical test were given two driving tests only days apart, many performed **inconsistently** between the tests. A third (36%) of candidates passed one but also failed one of the two tests (Baughan et al., 2005a). Much of this inconsistency is related to candidates coming forward for the test when they are only just good enough to pass if they drive at their best. That is, their rate of making serious or dangerous faults is still at the stage where they may make one in one test but not in another. This raises concerns about, firstly, the **reliability** of the practical test (see Section 4.3), secondly, the level of **competence of candidates** when attempting the test (see Section 3.3) and thirdly, the **ability of new drivers** when they pass the test – as the research showed, some of these inconsistent candidates actually pass the test and thus are subsequently able to drive independently on the roads.

18 In 2006, 44% of those killed or serious injured in road accidents were on rural roads (DfT, 2007e: Chart 1e).

5.4 Although new drivers emerge from the practical test with high levels of confidence in their driving ability, they can identify gaps in their skills but seek no further training

For many new drivers, initial confidence in their ability to drive, which is validated by passing the test, starts to wane when they realise the complexity of the driving task and the diversity of the situations they will encounter on the roads. After passing the practical test drivers can identify their own weaknesses, but few resort to further training.

5.4.1 New drivers are initially overconfident in their driving ability

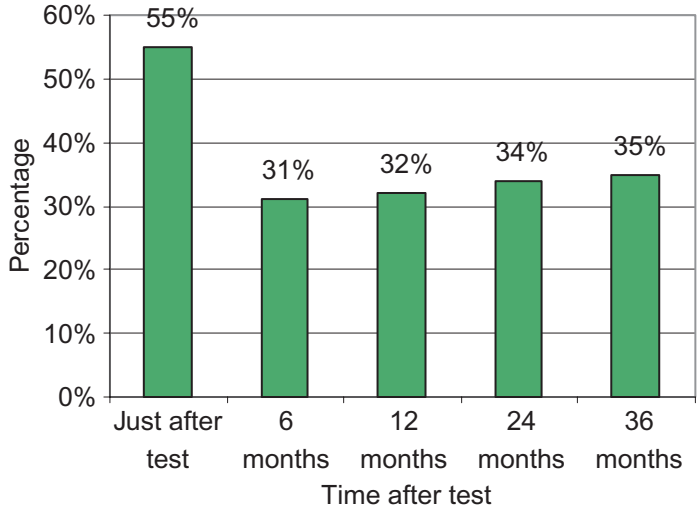
Inexperienced drivers show less awareness than experienced drivers of the actual realities of road system operation, and less awareness of their own role and ability (ECMT, 2006). Calibration refers to the degree of accuracy with which drivers judge their own capability and the degree of accuracy with which they judge the demands of the driving task. The calibration problem (miscalibration) arises where drivers either overestimate their capability or underestimate task demands. Both lead to the driver's perception that their safety margin is greater than it objectively is (see Fuller 2000). Miscalibration may for instance lead to: small safety margins, excessive speed, aggressive driving, short following distances, and more risky manoeuvres.

A number of studies suggest that drivers have an unrealistic view of their own driving ability (see Kuiken and Twisk, 2001). Young drivers, particularly males, tend to be overconfident and overestimate their ability to avoid hazards and their consequences (see Matthews and Moran, 1986; Gregersen and Bjurulf, 1996; Gregersen 1996b). In addition, research has found that young inexperienced drivers underestimate the demands of the driving task (Brown and Groeger, 1988; Deery, 1999).

Many new drivers are initially **overconfident** in their driving ability. Figure 5.2 shows how the level of confidence changed over time and with experience, among respondents to the Cohort II study. Despite initial high confidence, they experienced a substantial drop in confidence (in their own driving ability) during the first six months of unsupervised driving – when new drivers have the highest accident liability. In this period, the proportion reporting feeling very confident fell from 55% to 31%, although levels of confidence remained fairly stable from six months up until 36 months post-test (Wells et al., 2008).

According to a poll for Norwich Union, over half (55%) of drivers aged 17 to 23 claimed to have felt very comfortable driving very soon after they passed their test. This poll also found that nearly half (45%) of these young drivers believed that they were very safe drivers and did not need to change anything about their driving. Three-quarters (73%) did not believe that using technology in cars, such as mobile phones and music systems, makes them unsafe (Norwich Union, 2007).

Figure 5.2: Changes in the levels of reported confidence in driving ability over time



(Source: Cohort II (Wells et al., 2008))

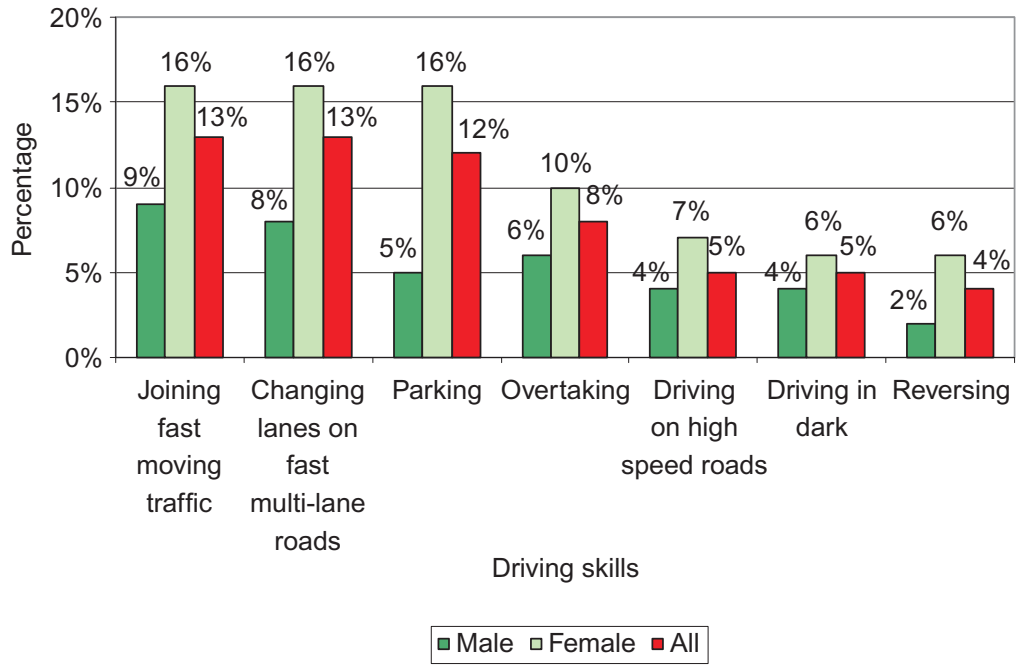
5.4.2 *New drivers admit to significant gaps in their driving skills just after the practical test*

The Cohort II study found that respondents who had passed the practical test could identify a number of driving skills which they felt needed improvement despite being assessed as capable of safe, independent driving. Nearly a third (31%) of those who passed indicated that they needed 'a lot' of improvement in at least one skill just **after passing** their practical test. One in eight (13%) respondents who passed the test identified that they needed a lot of improvement in joining fast moving traffic and in changing lanes on fast multi-lane roads (Figure 5.3).

To some extent the self-identified gaps in skills are logical and inevitable given that learning to drive and gaining driving experience is ongoing. These perceptions could indicate new drivers have not been adequately taught these skills or that they did not feel confident in conducting these manoeuvres to a high standard (i.e. representing real or perceived skills gaps); either way, these findings represents a void which neither driver training nor the practical test has addressed (Wells et al., 2008).

Perhaps of greatest concern of these reported skills deficits, is that new drivers feel they lack skills in joining and changing lanes on a motorway or fast dual–carriageway, in overtaking, in judging what other drivers are going to do generally and in judging the speed of other traffic. Such assessments seemed to apply strongly to female drivers, though whether this reflects a difference between males and females in actual skill levels or in an ability to assess their own skills is not known. Wells et al. (2008) concludes that that driving instructors (ADIs) need to have greater awareness of the need to spend increased time with learners on faster roads.

Figure 5.3: Proportion of respondents who felt that they needed 'a lot' of improvement in certain driving skills shortly after passing the driving test, by sex



(Source: Cohort II (Wells et al., 2008))

This should help increase new drivers' ability and confidence in coping with the challenges of dealing with fast-moving traffic.

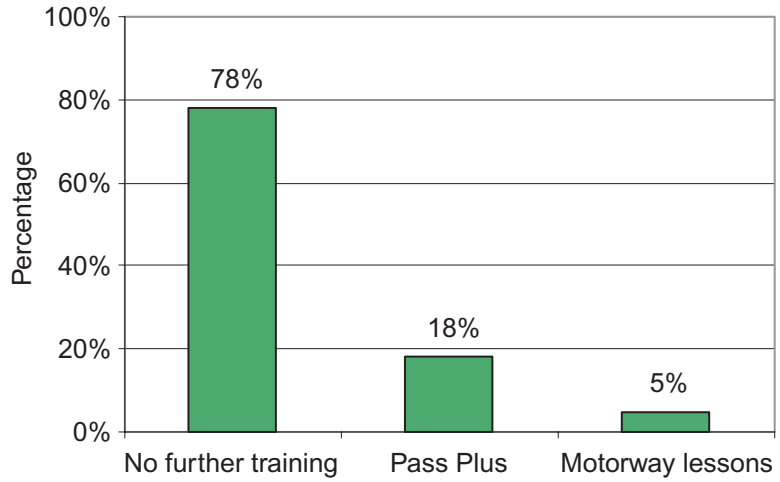
5.4.3 *Only a small proportion of new drivers take further training to improve their driving after passing their test*

The vast majority of new drivers do not seek further training and guidance despite having identified deficits in their own driving skills (Section 5.4.2). This means that new drivers tend to teach themselves how to drive and learn from their own mistakes and experiences (Sections 5.2.2 and 5.2.3). Of the respondents to the Cohort II study, only one in five (22%) took any form of **further instruction** or training in the first year after passing their practical driving test (Figure 5.4).

The **Pass Plus** scheme was set up in 1995 to improve the road safety of new drivers.[19] One-fifth (18%) of Cohort II respondents reported having taken Pass Plus in the first year of driving. A higher proportion of male respondents than female respondents reported taking it (23% and 16% respectively). The DSA estimates that

19 Pass Plus was designed by the DSA with the help of insurers and the driving instruction industry to help new drivers gain valuable driving experience safely, build on their existing skills and knowledge, reduce the risk of being in a road crash, save money on car insurance premiums and boost their confidence. The course can be taken any time within 12 months of obtaining a full driving licence.

Figure 5.4: Proportion of respondents who passed the test and took further instruction in their first year of driving



(Source: Cohort II (Wells et al., 2008))

the overall national take-up rate for Pass Plus is lower – currently around one in ten (11%) (DSA, 2007, unpublished data).

5.5 Young and new drivers exhibit a range of unsafe attitudes and driving behaviours

Young and new drivers demonstrate a variety of attitudes and driving behaviours that result in unsafe driving practices, which can sometimes lead to accidents.

5.5.1 Young and new drivers exhibit speeding behaviour

Forthcoming research by Stradling et al. found that that 17–24-year-old drivers are more likely than any other age group to admit to speeding and to more excessive speeding in 30 mph, 60 mph and 70 mph zones (Stradling et al., 2008, in press). Two recent polls also find that young and new drivers exhibit speeding behaviour. Firstly, a poll of 1,550 motorists concerning driving habits on country lanes commissioned by Autoglass/Brake in 2007 found that two-fifths (42%) of drivers aged 18 to 24 had taken a bend at speed (Autoglass, 2007), although these data did not explore the extent to which these drivers lost control as a result. Secondly, the THINK! poll in 2007 found that nearly four in ten (37%) drivers aged 18 or more with less than three years experience reported that they drive too fast for the conditions compared with three in ten (28%) drivers, irrespective of driving experience (Angle et al., 2007).

5.5.2 Young and new drivers admit to drink driving

Latest national accident statistics, from 2005, show that drivers under the age of 25 years are over-represented in drink-drive accidents per 100,000 licence holders and per 100 million miles driven (DfT, 2007e).

In the THINK! poll, one in twenty (6%) drivers aged 18 or more with less than three years of driving experience admitted that they had driven when over the legal alcohol limit. This proportion is also reflected in the wider driver population. Similarly, one in twenty (5%) of these drivers with less than three years of driving experience stated that they had driven after taking class A drugs, compared with only 1% of all drivers (Angle et al., 2007).

A Norwich Union poll of a poll of over 1,200 drivers aged 17 to 23 found that one in four (23%) young male drivers from this age group claimed to have driven under the influence of illegal drugs and/or alcohol at some stage, compared with 13% of female drivers of the same age. The question in the poll however, did not qualify whether this drinking made them over the legal limit for driving or not. Four out of ten (44%) of these respondents admitted to having driven the 'morning after' when still under the influence of alcohol and/or illegal drugs – many of whom believed that it would not affect their driving capabilities. Such a finding could indicate a lack of understanding about the dangers of drink driving (Norwich Union, 2007) or represent an accurate estimation of the residual effects.

5.5.3 Young drivers think that their peers' driving is unsafe

The Norwich Union found that only a third (31%) of respondents (drivers aged 17 to 23) think young drivers are safe drivers. Four out of ten (44%) regard their peers as unsafe drivers, although the percentage (51%) was much higher for young male drivers (Norwich Union, 2007). These findings may be evidence of a false consensus which could result in increased unsafe behaviour or it may represent a correct perception. Unfortunately, the poll did not explore this issue further.

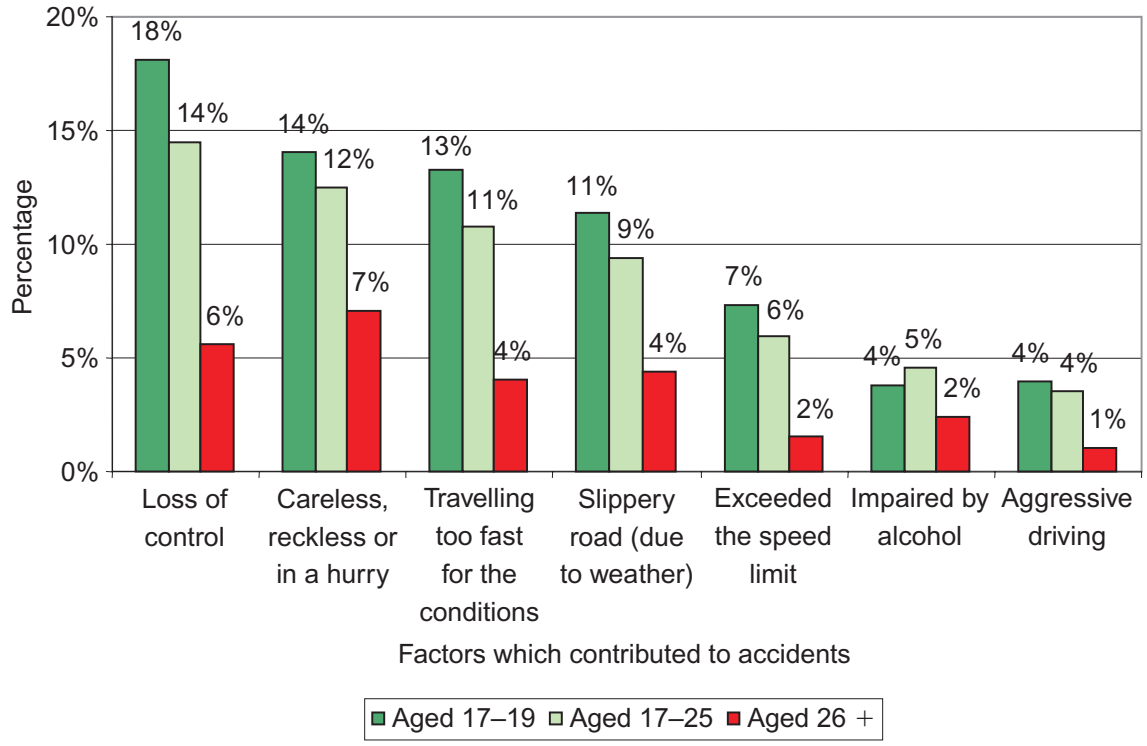
5.5.4 Young drivers exhibit risky behaviour which contributes to accidents

Data from STATS19 in 2006 showed that the most commonly reported contributory factor[20] in road accidents was driver error or reactions, which represented two-thirds (67%) of accidents (DfT, 2007e). More detailed analysis of STATS19 data from 2006 show that younger drivers are over-represented in the proportion of accidents involving contributory factors which are **attributable to the driver** (Figure 5.5). These mostly represent accidents in which, to some extent drivers have chosen to drive in a risky or dangerous manner (see Section 4.2.1).

20 More detail about the analysis of contributory factors can be found at www.dft.gov.uk/162259/162469/221412/221549/227755/contributoryfactorstoroadacc1802

Figure 5.5 shows that accidents involving younger drivers were at least **twice as likely** to have contributory factors, such as loss of control, being careless, reckless or in hurry, travelling too fast for the conditions, failure to manage slippery roads, speeding, drink-driving, and aggressive driving compared with older drivers (DfT, 2006b). Involvement in accidents is explored further in the following Sections.

Figure 5.5: Proportion of drivers in accidents with factors attributable to the driver, by age group of driver, 2006



(Source: STATS19 2006 (unpublished data))

5.6 Many young drivers are involved in road accidents and they are over-represented in road casualty statistics

New drivers are at highest risk of being involved in a road accident immediately after they have passed their test. The risk of injury in road accidents peaks in the late-teenage years, which coincides with the period when many young people learn to drive (Broughton and Buckle, forthcoming).

Road accidents continue to affect a large proportion of the population, including those who are involved directly but also their friends and family. Accidents come at a large cost. The Department for Transport publishes data that estimate the value for the prevention of road casualties and road accidents. The average value of prevention, per fatal accident in Great Britain at 2005 prices, was **£1,644,790**. The

total cost-benefit of prevention of all road accidents, irrespective of age,[21] in 2005, was estimated to be **£17,854 million** (see DfT 2007b and 2006d for more information).

5.6.1 *A large number of young and new drivers are involved in road accidents and near misses*

Large numbers of new drivers are involved in accidents or near accidents. As mentioned in Section 1.2.1, one in five (19%) respondents in the Cohort II study reported having an accident in the first six months of independent driving – though, of course, the majority of these represented bumps and scrapes rather than accidents involving casualties. More than two-thirds (70%) reported having a near accident in the same time period. These figures illustrate the extent to which new drivers are at risk in the first months of independent driving (Wells et al., 2008).

5.6.2 *Many young and new drivers are involved in road casualty accidents*

In 2006, there were 899 deaths in road traffic accidents involving car drivers aged 17 to 24 years – 350 of these people killed were car drivers of that age group.[22]

The number of people killed or seriously injured in road accidents in Britain has decreased from the average of 1994–98.[23] However, despite this success, much of this reduction is in the number of serious injured; reducing the number of people killed on the roads has proved much more difficult. The Government's road safety strategy has also been less effective in reducing death and injury among **young drivers** than other groups (DfT, 2007a). A total of 145 young car drivers aged 17 to 19 were killed in 2006 compared with an average of 125 in the years from 1994 to 1998. However, data from the National Travel Survey suggest that that young drivers (aged 17 to 19 years) as a proportion of all licensed drivers has remained at similar levels over time – approximately 2% of all licence holders.

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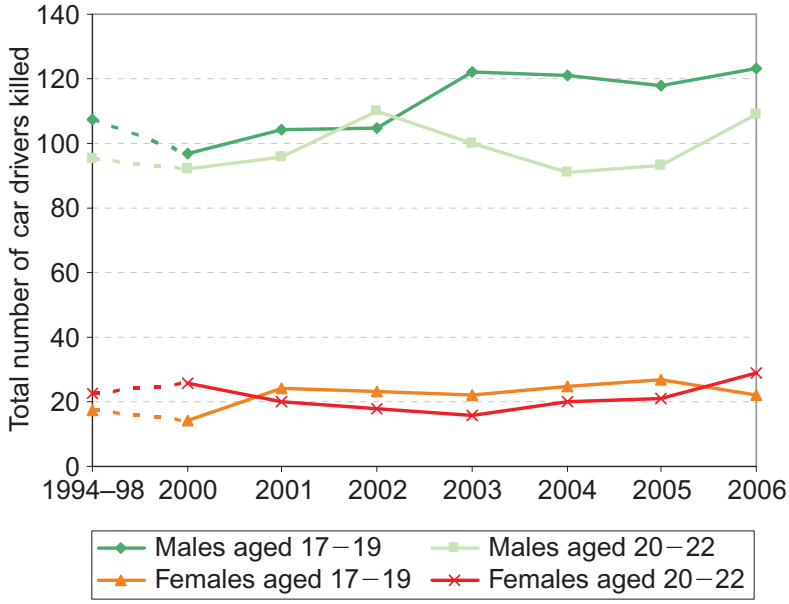
21 The Department for Transport does not attempt to give estimates of the value of the prevention of accidents by ages as HM Treasury guidance states that differences in wealth should be ignored for equity reasons: 'everyone at risk from accidental death should be treated as if they were of average income and wealth, producing average net output, of average age and expressing an average level of risk aversion' (HM Treasury, 2005).

22 The casualty numbers also include unlicensed drivers.

23 This represents the baseline of the Department for Transport's Public Service Agreement: 'Compared with the average for 1994–98, by 2010 we want to achieve a 40% reduction in the number of people killed or seriously injured in road accidents; a 50% reduction in the number of children killed or seriously injured; and a 10% reduction in the slight casualty rate, expressed as the number of people slightly injured per 100 million vehicle kilometers' (see DfT, 2000).

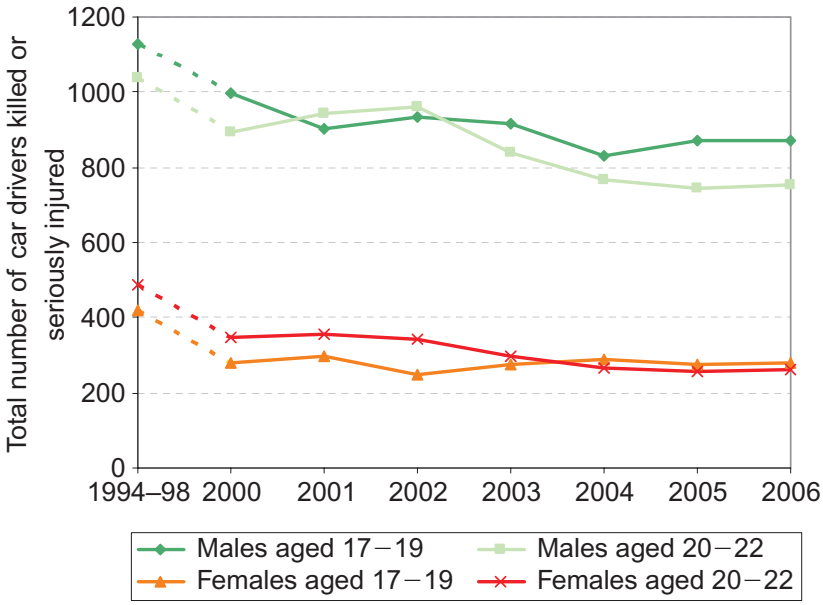
Figures 5.6 and 5.7 show that the number of young car drivers aged up to 22 years that are killed or seriously injured has not fallen in recent years.

Figure 5.6: Trends in the number of young car drivers killed by age and sex, 1994–98 to 2006



(Source: from Broughton and Buckle, forthcoming (based on data from STATS19))

Figure 5.7: Trends in the number of young car drivers killed and seriously injured by age and sex, 1994–98 to 2006



(Source: from Broughton and Buckle, forthcoming (based on data from STATS19))

It is recognised that further progress is needed in tackling the causes of car collisions involving young drivers, and indeed new drivers, and there are indications that there is room for improvement in training and testing to help people become safer and better drivers.

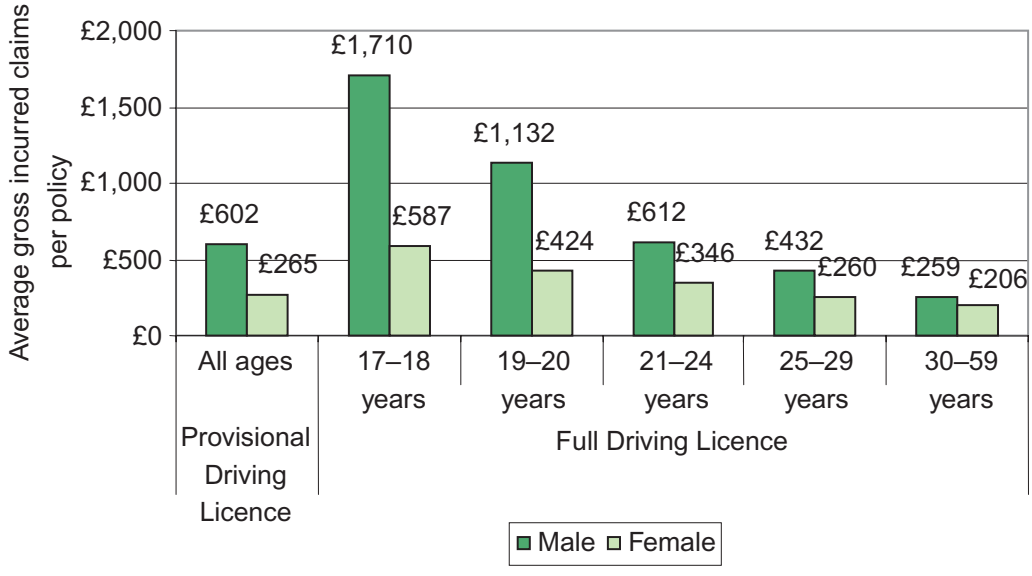
5.6.3 *Young drivers are over-represented in reported road casualties*

Young drivers are over-represented in road casualties involving car drivers. As mentioned in the previous Section, drivers aged 17 to 19 account for approximately 2% of the total licensed driving population – yet in 2006, they represented 12% of all car drivers who were killed and seriously injured on Britain's roads. They also represented 14% of driver deaths in 2006 (STATS19 2006).

5.6.4 *As a result of high accident rates, young drivers have relatively high insurance premiums*

The higher accident risk for young drivers is reflected in the higher insurance premiums charged to cover them. According to research by the Association of British Insurers (ABI), drivers aged 17 to 20 are **twice as likely to make an insurance claim** as older drivers, and the average value of each claim is three times greater, resulting in higher premiums for young drivers (ABI, 2006b). Figure 5.8 shows the average cost of insurance claims for different drivers.

Figure 5.8: Average cost of insurance claims per policy by licence type, age and sex, 2003



(Source: ABI, 2005)

When comparing the premiums paid with the value of claims made by drivers, by age and sex, the ABI found that for male drivers aged 17 to 18, on average, claim values are reported to significantly exceed the premium paid. As a result, the ABI conclude that 'the key to lower premiums is to lower the accident rate of young drivers' (ABI, 2006b).

5.7 Summary

Some new and young drivers have a poor understanding of good driving

- Young drivers are less aware of the social dimensions of driving which govern the shared use of the road.
- Some new drivers believe that they really learn to drive after passing the practical test.
- Many young drivers believe that accidents are a normal part of learning to drive after the test.

New drivers have significant gaps in driving experience or ability when they qualify for a full licence

- Too many new drivers qualify with little or no exposure to many typical driving conditions.
- Many of those who pass the test have not achieved a consistent standard.

Although new drivers emerge from the practical test with high levels of confidence in their driving ability, they can identify gaps in their skills but seek no further training

- New drivers are initially overconfident in their driving ability.
- New drivers admit to significant gaps in their driving skills just after passing the practical test
- Few new drivers take further training to improve their driving after passing their test.

Young and new drivers exhibit a range of unsafe attitudes and driving behaviours

- Young and new drivers exhibit speeding behaviour.
- Young and new drivers admit to drink driving.
- Young drivers think that their peers' driving is unsafe.
- Young drivers exhibit risky behaviour which contributes to accidents.

Many young drivers are involved in road accidents and they are over-represented in road casualty statistics

- A large number of young and new drivers are involved in road accidents and near misses.
- Many young and new drivers are involved in road casualty accidents.
- Young drivers are over-represented in road casualties.
- As a result of high accident rates, young and new drivers have relatively high insurance premiums.

6 KEY CONCLUSIONS AND NEXT STEPS

This chapter highlights the key conclusions drawn from the evidence and sets out the next steps.

6.1 Key conclusions

The evidence suggests that the reform of driver training and testing has both learning and testing challenges. These are summarised below.

6.1.1 The learning challenges

The right quantity and type of experience

The evidence suggests that experience *prior* to becoming a new driver is related to success in passing the driving test and greater safety as a new driver (Section 3.2.3). but driving experience *post-test* is necessary be a safe driver (Box 1.2). One learning problem for new drivers is that, prior to obtaining a full licence, the requirement for an accompanying qualified driver limits the amount, and probably the kinds, of driving experience they can get (Section 3.2.3). The current arrangements for training and testing motivate drivers to apply for the test as soon as they think they have a moderate chance of passing (Section 3.3.1). In order to improve their safety of the roads, learners and new drivers need to be encouraged to learn *more* than what is currently tested – for example, getting experience for the full range of driving conditions, such as night-time driving and driving in bad weather (Section 5.3.1).

Systematic learning around explicit goals and ownership of those goals

The Driver Record makes explicit what the trainee's goals should be, but it has not been taken up by a majority of learner drivers (Section 3.2.4). The reasons for this need to be explored, however the current format of the document implies it is more a tool for an instructor than for the driver (Section 4.2.4). There is a need for greater clarity about what needs to be learned in order to drive safely and to encourage learners to take responsibility for their learning, through effective progress reporting and self-evaluation (Section 3.2.5).

Creating a culture of life-long learning and driver development

There is a need to engage with young people before they start learning to drive (Section 4.2.5) and to help learner and new drivers develop safer attitudes, greater self-awareness and reduce the likelihood of dangerous behaviour (Sections 4.2.2 and 5.5.4). Many drivers see the test as the final stage of learning to drive and very few newly qualified drivers undertake any further training or qualifications (Section

5.4.3). However, a high accident rate (Section 5.6.1) , gaps in exposure to certain driving conditions (Section 5.3.1), and perceptions of significant gaps in driving skills (Section 5.4.2), as well as the changes in demands associated with independent driving (Section 4.3.2), indicate that some new drivers might benefit from some kind of further training.

6.1.2 The testing challenge

Creating an overall driving test that gives a more realistic and rounded assessment of whether someone is fit to drive alone

The practical test focuses too much on a candidate's ability to control the car safely at the expense of other knowledge and skills (Section 4.2). It can only sample and measure a range of competencies under test conditions, not the driver's future behaviour under non-test conditions. Driver behaviour is influenced not just by the driver's competencies but also by attitudes, values and motives which can seriously undermine safety (Sections 4.2.1, 4.2.2 and 5.5.4). The testing challenge is therefore to design test elements which reliably measure these motivational influences and to focus more generally on whether candidates are ready to drive unsupervised.

6.2 Next steps

This report has identified a number of problems with the existing system of driver training and testing, and presents evidence that reform is needed if these problems are to be addressed effectively.

The Driving Standards Agency (DSA) has launched the *Learning to Drive* consultation paper (DSA, 2008a) on driver training and testing, which tackles many of the issues raised here, including:

- different approaches to raising the safety of newly qualified drivers;
- improved testing arrangements; and
- new learning arrangements.

The consultation paper is available from the DSA website (www.dsa.gov.uk).

NOTES ON KEY DATA SOURCES

- **Cohort II: a study of learner and new drivers (Cohort II)** – this is a major six-year study of learner and new drivers funded by the Department for Transport. It provides an up-to-date picture of how 'cohorts' of learner drivers in Great Britain undertake driver training and testing, and of their subsequent experiences as new drivers. Samples of 8,000 candidates for the practical driving test were approached each quarter from November 2001 until August 2006. These candidates completed postal questionnaires shortly after taking their practical driving test. Those who had passed their test were then asked to complete further questionnaires about their experiences as new drivers at 6, 12, 24 and 36 months after passing their test. The data from the Cohort II study are not representative of **all** new drivers, as they represent a self-selecting sample. More information on this study can be found in the research report by Wells et al. (2008). This report and associated data tables are available at http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/

- **National Travel Survey (NTS)** – this survey is commissioned by the Department for Transport and is designed to provide data on personal travel in Great Britain. The survey helps provide a better understanding of the use of transport facilities made by different sectors of the population and trends in these patterns of demand. It has been conducted as a continuous survey since July 1988, following ad-hoc surveys since the mid-1960s. The survey is designed to identify long-term trends and is not suitable for monitoring short-term trends. More information about the survey methodology and the results can be found at www.dft.gov.uk/pgr/statistics/datatablespublications/personal/

- **Road Safety Information System (RSIS) database** – this database held by the Driving Standards Agency (DSA) contains data on the driving test performance of candidates. These data are not routinely published.

- **STATS19** – this is a database of injury accidents held by the Department for Transport. Accidents included in the database involve personal injury occurring on the public highway (including footways) in which at least one road vehicle or a vehicle in collision with a pedestrian is involved and which becomes known to the police within 30 days of its occurrence. The vehicle need not be moving and accidents involving stationary vehicles and pedestrians or users are included. One accident may give rise to several casualties. Data are published annually by the Department for Transport in *Road Casualties Great Britain.* More information can be found at http://www.dft.gov.uk/pgr/statistics/datatablespublications/accidents/casualtiesgbar/

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REFERENCES

Angle, H., Buckley, K., Fearn, A. and Goddard, E. (2007) THINK! Road safety campaign evaluation: Annual survey 2007. Online report. London: Department for Transport. www.thinkroadsafety.gov.uk/research/pdf/2007-11.pdf

Association of British Insurers (ABI) (2006a) *Pass Plus: Ten Years On. An ABI Review of the Evidence*. London: ABI. www.abi.org.uk/BookShop/ResearchReports/06%2008%2021%20Pass%20Plus%20-%2010%20years%20on%20Report%20_SS%20comments_.pdf

Association of British Insurers (ABI) (2006b) *Young Drivers: Reducing Death on the Roads. Four Actions to Save Lives*. London: ABI. http://www.abi.org.uk/BookShop/ResearchReports/Young%20Drivers.pdf

Association of British Insurers (ABI) (2005) *Young Drivers: Improving their Safety Record*. London: ABI. http://www.abi.org.uk/BookShop/ResearchReports/Young%20Drivers%20-%20Improving%20their%20Safety%20Record%20_ABI%20report_.pdf

Autoglass (2007) Reckless young drivers put lives in danger on rural roads. Press release, 9 July 2007.

Baker, O., O'Malley, K., Terry, C. and Wiffen, C. (2008) *Why People Drive Without a Licence: The Reasons Behind Unlicensed Driving*. Online report. London: Department for Transport.

Baughan, C., Sexton, B., Maycock, G., Simpson, H., Chinn, L. and Quimby, A. (2005a) *Novice Driver Safety and the British Practical Driving Test*. TRL Report No. 652. Crowthorne: TRL.

Baughan, C., Gregersen, N. P., Hendrix, M. and Keskinen, E. (2005b) *Towards European Standards for Testing. Final Report*. Brussels: CIECA.

Baughan, C. (2006) Lifelong learning in road safety. *Proceedings of the CIECA 50th Anniversary Congress*, Marseilles. Brussels: CIECA. www.cieca.be/download/BAUGHAN.pdf

Broughton, J. and Buckle, G. (2007) *Monitoring Progress Towards the 2010 Casualty Reduction Target – 2005 data*. Crowthorne: TRL.

Broughton, J. and Buckle, G. (forthcoming) *Monitoring Progress Towards the 2010 Casualty Reduction Target – 2006 data*. Crowthorne: TRL.

Brown, I. D. and Groeger, J.A. (1988) Risk perception and decision taking during the transition between novice and experienced driver status. *Ergonomics*, 31, 585–597.

Cartmel, F. and Furlong, A. (2000) *Youth Unemployment in Rural Areas*. York: Joseph Rowntree Foundation.

Christmas, S. (2007) *The Good the Bad and the Talented: Young Drivers' Perspectives on Good Driving and Learning to Drive*. Road Safety Research Report No. 74. London: Department for Transport.

Christmas, S. (2008) *Feeling Safe, Itching to Drive: Pre-driver and Learner Perspectives on Driving and Learning*. Road Safety Research Report No. 86. London: Department for Transport.

CIECA (2007) Internal project on 'eco-driving' in Category B driver training and the driving test. Brussels: CIECA.

Clarke, D., Ward, P. and Truman, W. (2002) *In-depth Accident Causation Study of Young Drivers*. TRL Report No. 542. Crowthorne: TRL.

Clarke, D., Ward, P., Truman, W. and Bartle, C. (2007) *Fatal Vehicle Occupant Collision: An In-depth Study.* Road Safety Research Report No. 75. London: Department for Transport.

Deery, H. A. (1999) Hazard and risk perception among young novice drivers. *Journal of Safety Research*, 30, 225–236.

Deighton, C. and Luther, R. (2007) *Pre-driver Education: A Critical Review of the Literature on Attitude Change and Development, Good Practice in Pre-driver Education and Programme Effectiveness*. Road Safety Research Report. London: Department for Transport. www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/predrivereducation.pdf

Department for Transport (DfT) (2000) *Tomorrow's Roads: Safer for Everyone*. London: Department of the Environment, Transport and the Regions. www.dft.gov.uk/pgr/roadsafety/strategytargetsperformance/tomorrowsroadssaferforeveryone?page=2#a1003

Department for Transport (DfT) (2006a) *Evidence Base Review on Mobility: Choices and Barriers for Different Social Groups*. London: Department for Transport. www.dft.gov.uk/pgr/scienceresearch/social/evidence_base_review_on_mobility

Department for Transport (DfT) (2006b) *Road Casualties Great Britain: 2005*. London: Department for Transport. www.dft.gov.uk/pgr/statistics/datatablespublications/accidents/casualtiesgbar/roadcasualtiesgreatbritain2005

Department for Transport (DfT) (2007a) *Tomorrow's Roads – Safer for Everyone: The Second Three-year Review.* London: Department for Transport. www.dft.gov.uk/pgr/roadsafety/strategytargetsperformance/2ndreview/

Department for Transport (DfT) (2007b) Trends in Fatal Car-occupant Accidents. Road Safety Research Report No. 76. London: Department for Transport.

Department for Transport (DfT) (2007c) *Transport Trends – 2006 edition*. London: Department for Transport.

Department for Transport (DfT) (2007d) Highways Economic Note 1 (HEN1). London: Department for Transport.

Department for Transport (DfT) (2007e) *Road Casualties Great Britain: 2006*. London: Department for Transport. www.dft.gov.uk/pgr/statistics/datatablespublications/accidents/casualtiesgbar/

Derek Halden Consultancy (2003) *Children's Attitudes to Sustainable Transport*. Edinburgh: Scottish Executive.

Driving Standards Agency (DSA) (2001) *Introducing Hazard Perception Testing into the Driving Theory Test: A Driving Standards Agency Discussion Paper.* Nottingham: Driving Standards Agency.

Driving Standards Agency (DSA) (2004) Safe Driving for Life. Nottingham: Driving Standards Agency. www.dsa.gov.uk/Documents/publications/Safe_Driving_for_Life_Nov04.pdf

Driving Standards Agency (DSA) (2007) Data from Customer Insight Surveys. Unpublished.

Driving Standards Agency (DSA) (2008a) *Learning to Drive Consultation.* Nottingham: Driving Standards Agency. www.dsa.gov.uk/learningtodrive

Driving Standards Agency (DSA) (2008b) *Learning to Drive: Partial Impact Assessment*. www.dsa.gov.uk/learningtodrive

European Conference of Ministers of Transport (ECMT) (2004) *Keeping Children Safe in Traffic*. Paris: Organisation for Economic Co-operation and Development (OECD) Publishing.

European Conference of Ministers of Transport (ECMT) (2006) *Young Drivers – The Road to Safety.* Paris: Organisation for Economic Co-operation and Development (OECD) Publishing.

Elliott, M. A. (2006) Can we use the Cohort II data to explore the effects of taking Pass Plus? *Behavioural Research in Road Safety: Sixteenth Seminar.* London: Department for Transport. www.dft.gov.uk/pgr/roadsafety/research/behavioural/sixteenthseminar/pdf

Forsyth, E. (1992a) *Cohort Study of Learner and Novice Drivers Part 1: Learning to Drive and Performance in the Driving Test*. TRL Research Report No. 338. Crowthorne: TRL.

Forsyth, E. (1992b) *Cohort Study of Learner and Novice Drivers Part 2: Attitudes, Opinions and the Development of Driving Skills in the First Two Years*. TRL Research Report No. 372. Crowthorne: TRL

Fuller, R. (2000) The Task-Capability Interface model of the driving process. *Recherche Transports Securité*, 66, 47–59.

Fuller, R., Bates, H., Gormley, M., Hannigan, B., Stradling, S., Broughton, P., Kinnear, N. and O'Dolan, C. (2008) The conditions for inappropriate high speed: a review of the research literature from 1995 to 2006. Road Safety Research Report. London: Department for Transport, in press.

Grayson, G. and Sexton, B. (2002) The Development of Hazard Perception Testing. TRL Report No. 558. Crowthorne: TRL.

Gregersen, N. P. (1996a) Young drivers' overestimation of their own skill – an experiment on the relation between training strategy and skill. *Accident Analysis and Prevention*, 28(2), 243–250.

Gregersen, N. P. (1996b) *Young Car Drivers: Why Are They Over Represented in Traffic Accidents? How Can Driver Training Improve their Situation?* VTI Report No. 409A. Linköping: Swedish Road and Traffic Research Institute.

Gregersen, N. P., Berg, H. Y., Engström, I., Nolén, S., Nyberg, A. and Rimmö, P. A. (2000) Sixteen years age limit for learner drivers in Sweden – an evaluation of safety effects. *Accident Analysis and Prevention*, 32, 25–35.

Gregersen, N. P. and Bjurulf, P. (1996) Young novice drivers: Towards a model of their accident involvement. *Accident Analysis and Prevention*, 28, 229–34.

Groeger, J. A. and Brady, S. J. (2004) Differential Effects of Formal and Informal Driver Training. Road Safety Research Report No. 42. London: Department for Transport.

Hatakka, M., Keskinen, E., Gregersen, N. P., Glad, A. and Hernetkoski, K. (2002) From control of the vehicle to self control: broadening the perspectives of driver education. *Transportation Research*, Part F5.

Hatakka, M., Keskinen, E., Baughan, C., Goldenbeld, C, Gregersen, N. P., Groot, H., Siegrist, S., Willmes-Lenz, G. and Winkelbauer, M. (2003) *BASIC – Driver Training: New Models, Final report*. University of Turku: Finland.

HM Treasury (2005) *Managing Risks to the Public: Appraisal Guidance*. London: HM Treasury. www.hm-treasury.gov.uk/consultations_and_legislation/greenbook_consultations/consult_greenbook_index.cfm

House of Commons (2007a) *Novice Drivers: Seventh Report of Session 2006–07.* Volume 1: Report and formal minutes Transport Committee. London: The Stationery Office. www.publications.parliament.uk/pa/cm200607/cmselect/cmtran/355/35502.htm

House of Commons (2007b) *Novice Drivers: Seventh Report of Session 2006–07.* Volume 2*:* Oral and written evidence. Transport Committee. London: The Stationery Office. www.publications.parliament.uk/pa/cm200607/cmselect/cmtran/355/7022801.htm

Kingham, S. and Donohoe, S. (2002) Children's perceptions of transport. *World Transport Policy & Practice*, 8(1), 6–1. http://ecoplan.org/wtpp/wt_index.htm

Knox, D., Turner, B. and Silcock, D. (2003a) *Research into Unlicensed Driving*: literature review. Road Safety Research Report No. 38. London: Department for Transport.

Knox, D., Turner, B. and Silcock, D. (2003b) *Research into Unlicensed Driving*. Final report. Road Safety Research Report No. 48. London: Department for Transport.

Kuiken, M. and Twisk, D. (2001) Safe driving and the training of calibration: literature review. Report R-2001-29. Leidschendam: SWOV Institute for Road Safety Research.

Lang, B., Jones, E. and Inwood, C. (forthcoming) *Learning to Drive Using a Driver Record: Views from Instructors, Learners, Accompanying Drivers and New Drivers*.

Launchbury, C., Deighton, C. and Luther, R. (2007) *Pre-driver Education: Survey of Pre-Driver Education Provision*. London: Department for Transport. www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/predrivereducationsurvey.pdf

Lester, J. F. (1991) *Individual Differences in Accident Liability: A Review of the Literature*. TRRL Report No. RR306. Crowthorne: Transport and Road Research Laboratory.

Martin, A., Moreland, V., Harper, H. and Huggins, P. (2004) *An Investigation into the Social Exclusion of Young People in Relation to Transport Provision*. Crowthorne: TRL.

Matthews, M. L. and Moran, A.R. (1986) Age differences in male drivers' perception of accident risk: the role of perceived driving ability. *Accident Analysis and Prevention, 18, 299-313*.

Maycock, G. (2002) *Novice Driver Accidents and the Driving Test*. TRL Report No. TRL 527. Crowthorne: TRL.

Maycock, G., Lockwood, C. R. and Lester, J. F. (1991) *The Accident Liability of Car Drivers*. TRRL Research Report No. 315. Crowthorne: Transport and Road Research Laboratory.

McKenna, F. P. (1982) The human factor in driving accidents, an overview of approaches and problems. *Ergonomics*, 25, 867–877.

Mills, K. L., Rolls, G. W. P., Hall, R. D. and McDonald, M. (1998) *The Effects of Hazard Perception Training on the Development of Novice Driver Skills*. Road Safety Research Report No. 4. London: Department for Transport.

Noble, B. (2005) Why are some young people choosing not to drive? *Proceedings of the 23rd European Transport Annual Meeting,* 3–5 October 2005, Strasbourg. London: AET.

Norwich Union (2007) *17–23 Years: Road Age Report*. Norwich: Norwich Union. http://www.aviva.com/files/pdf/road_age_nov_07.pdf

Office for National Statistics (ONS) (2007) *Car Access*. London: ONS. www.statistics.gov.uk/cci/nugget.asp?id=1770

Parker, D. and Stradling, S. (2001) *Influencing Driver Attitudes and Behaviour.* Road Safety Research Report No.17. London: Department for Transport. www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/influencingdriverattitudesan4749

Royal Society for the Prevention of Accidents (RoSPA) (2002) *Young and Novice Drivers' Education, Training and Licensing*. Birmingham: RoSPA.

Stradling, S. (2005) *Public Perceptions of Travel Awareness*. Edinburgh: Transport Research Institute, The Scottish Executive.

Stradling, S., Fuller, R., Gormley, M., Broughton, P., Kinnear, N., O'Dolan, C. and Hannigan, B. (2008) *Understanding Inappropriate High Speed: A Quantitative Analysis*. Road Safety Research Report. London: Department for Transport.

Waylen, A. and McKenna, F. (2002) *Cradle Attitudes – Grave Consequences: The Development of Gender Differences in Risky Attitudes and Behaviour in Road Use*. Basingstoke: AA Foundation for Road Safety Research. www.iam.org.uk/NR/rdonlyres/ 3CB04728-6245-4925-AEBE-DFA7E58B665E/0/AA_foundation_FDN33.pdf

Ward, H., Christie, N., Lyons, R., Broughton, J., Clarke, D. and Ward, P. (2007) Trends in Fatal Car-occupant Accidents. Road Safety Research Report 76. London: Department for Transport.

Wells, P., Tong, S., Sexton, B., Grayson, G. and Jones, E. (2008) *Cohort II: A Study of Learner and New Drivers. Volume 1 – Main Report*. Road Safety Research Report 81. London: Department for Transport.

data and machine learning. Prof. Carvalho quoted John Stuart Mill, who proclaimed as early as the 1840s that â€œthere cannot be a more legitimate object of the legislatorâ€™s care than looking after those whose livelihoods are disrupted by machines.â€Â INGSA is an effective channel for driving evidence-based policy-making as it provides access to a comprehensive network of connections to leading experts in the field as well as inclusive platforms for dialogue that draw awareness to the need for sustainable solutions to scientific problems. Elsevierâ€™s analytical reports. At Elsevier, we believe is important to draw insights from our data together with our stakeholders, says Dr. Karlsson, who led Elsevierâ€™s collaboration with INGSA at the 2018 conference in Tokyo.