Synthesis title:

# Young Drivers

## Category: Drivers

**Other Relevant Topics:**

- Training (Roads)
- Convictions and Violations (Law and Compliance)

**Keywords:**

Young driver/s,
Novice driver/s,
New driver/s,
Learning to drive,
Driver training,
Pre-drivers,
Maturity to drive,
Deviant driving

# About the Road Safety Observatory

**The Road Safety Observatory aims to provide free and easy access to independent road safety research and information for anyone working in road safety and for members of the public. It provides summaries and reviews of research on a wide range of road safety issues, along with links to original road safety research reports.**

The Road Safety Observatory was created as consultations with relevant parties uncovered a strong demand for easier access to road safety research and information in a format that can be understood by both the public and professionals. This is important for identifying the casualty reduction benefits of different interventions, covering engineering programmes on infrastructure and vehicles, educational material, enforcement and the development of new policy measures.

The Road Safety Observatory was designed and developed by an Independent Programme Board consisting of key road safety organisations, including:

- Department for Transport
- The Royal Society for the Prevention of Accidents (RoSPA)
- Road Safety GB
- Parliamentary Advisory Council for Transport Safety (PACTS)
- RoadSafe
- RAC Foundation

By bringing together many of the key road safety governmental and non-governmental organisations, the Observatory hopes to provide one coherent view of key road safety evidence.

The Observatory originally existed as a standalone website, but is now an information hub on the RoSPA website which we hope makes it easy for anyone to access comprehensive reviews of road safety topics.

All of the research reviews produced for the original Road Safety Observatory were submitted to an Evidence Review Panel (which was independent of the programme Board), which reviewed and approved all the research material before it was published to ensure that the Key Facts, Summaries and Research Findings truly reflected the messages in underlying research, including where there may have been contradictions. The Panel also ensured that the papers were free from bias and independent of Government policies or the policies of the individual organisations on the Programme Board.

The Programme Board is not liable for the content of these reviews. The reviews are intended to be free from bias and independent of Government policies and the policies of the individual organisations on the Programme Board. Therefore, they may not always represent the views of all the individual organisations that comprise the Programme Board.

Please be aware that the Road Safety Observatory is not currently being updated; the research and information you will read throughout this paper has not been updated since 2017. If you have any enquiries about the Road Safety Observatory or road safety in general, please contact **help@rospa.com** or call **0121 248 2000**.

## How do I use this paper?

This paper consists of an extensive evidence review of key research and information around a key road safety topic. The paper is split into sections to make it easy to find the level of detail you require. The sections are as follows:

| | |
|---|---|
| **Key Facts** | A small number of bullet points providing the key facts about the topic, extracted from the findings of the full research review. |
| **Summary** | A short discussion of the key aspects of the topic to be aware of, research findings from the review, and how any pertinent issues can be tackled. |
| **Methodology** | A description of how the review was put together, including the dates during which the research was compiled, the search terms used to find relevant research papers, and the selection criteria used. |
| **Key Statistics** | A range of the most important figures surrounding the topic. |
| **Research Findings** | A large number of summaries of key research findings, split into relevant subtopics. |
| **References** | A list of all the research reports on which the review has been based. It includes the title, author(s), date, methodology, objectives and key findings of each report, plus a hyperlink to the report itself on its external website. |

**The programme board would like to extend its warm thanks and appreciation to the many people who contributed to the development of the project, including the individuals and organisations who participated in the initial consultations in 2010.**

***Key Facts***

- In 2016, 13% of all car occupants killed or seriously injured were young car drivers aged 17-25 years. For this age group there were 110 fatalities in 2016, a 17% fall from the 2011-15 average. (RRCGB, DfT, 2017) These reductions may reflect the proportion of young drivers with a licence which has decreased since the early 1990s.

- A survival analysis of the length of time to new drivers' first accident found three factors were associated with longer 'survival' rates: increased age, driving experience (possibly driving in busy town centres and in the rain) and a self-reported driving style characterised as 'attentive, careful, responsible and safe'.

- While driver age is a risk factor for collisions (with the youngest new drivers at most risk), the experience drivers gain in the first six months after passing their test plays a more significant role in reducing their collision rates.

- Nevertheless, the experience does not seem to be a key quality of a good driver in the view of young road users. Evidence from a range of studies suggests that they may overrate their driving ability and see driving as a matter of 'natural talent' which can be judged by how confident a driver feels. When asked to judge themselves, the vast majority of young drivers choose the term "safe driver". These remarks have important implications for understanding young drivers' attitudes in relation to road safety.

- There is little research evidence that increased formal driver training, before, during and after learning to drive, improves safety. A number of themes have emerged that offer the hope of improving the effectiveness of training, in making training address the cognitive and attitudinal aspects of driving.

- Across the first years of licensure, drivers' aberrant behaviours seem to be undertaken more frequently. Being male and of a younger age prove to be predictors for higher levels of aberrant actions.

- Attempts and efforts to dissuade them from aberrant actions may result in significant difficulties in the case of adolescents, since this developmental stage is characterised by emotional distortions and reactions.

- 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.

- Evidence based on accident statistics in Great Britain suggests that the introduction of multiple components of Graduated Driver Licensing (GDL) will result in saving at least 4,478 casualties, which is a conservative estimation. Limitations of passenger numbers (in general) and on driving between midnight and 5 a.m., are ideas that enjoy the support of over 60% of British people.

***Summary***


- In 2016, 13% of all car occupants killed or seriously injured were young car drivers aged 17-25 years. For this age group there were 110 fatalities in 2016, a 17% fall from the 2011-15 average. (RRCGB, DfT, 2017) These reductions may reflect the proportion of young drivers with a licence which has decreased since the early 1990s.

- These reductions may reflect fewer young drivers on the road. The proportion of young adults (aged 17-20) with a full driving licence has decreased since the early 1990s. In 1995/97, 43% of those aged 17-20 held a full licence, compared with a low of 27% in 2004 and 31% in 2016.

- A survival analysis of the length of time to new drivers' first accident found three factors were associated with longer 'survival' rates: increased age, driving experience (possibly driving in busy town centres and in the rain) and a self-reported driving style characterised as 'attentive, careful, responsible and safe'.

- While driver age is a risk factor for collisions (with the youngest new drivers at most risk), the experience drivers gain in the first six months after passing their test plays a more significant role in reducing their collision rates.

- However, young drivers generally decouple themselves from young drivers' collision statistics and ascribe them rather to a few irresponsible individuals. Experience does not seem to be a key quality in their view. Becoming a good driver is merely associated with gaining confidence at the wheel.

- 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.

- Young people in one study defined being a good driver as the mastery of three different and parallel kinds of activity:

    - Driving as a physical activity is about safely controlling and guiding a physical object through a complex environment (controlling the car, reading and reacting to road conditions, reading and anticipating other drivers).
    - Driving as a social activity is about operating in a shared space in a way that ensures everyone is kept happy, and in a way that builds and maintains a desired image of oneself as a driver.
    - Driving as an emotional activity is about preserving an appropriate frame of mind to drive well in the face of distractions and annoyances (right level of mental alertness and assertiveness).

- Addressing driving as an emotional activity can be particularly difficult in the case of adolescents since this developmental stage is characterised by emotional distortions and reactions. Moreover, in some social circles, this lack of self-regulation may become a way of self-expression and, along with car modifying, may become a means of creating and sustaining individual and collective identities of young people.

- Learner drivers with a more tolerant attitude to their own driving violations (many of them speed-related) tend to go on to have a higher post-test accident liability, based on measures from the Attitudes to Driving Violations Scale (ADVS).

- The current arrangements for training and testing appear to motivate drivers to apply for the test as soon as they think they have a moderate chance of passing. In order to improve their safety on the roads, learners and new drivers need to be encouraged to learn more than what is currently tested – for example, getting experience of the full range of driving conditions, such as night-time driving and driving in bad weather and on motorways.

- There is little research evidence that increased formal driver training improves safety. A number of themes have emerged that offer the hope of improving the effectiveness of training, one being the desirability of improving the hazard perception skills of learner drivers.

- The introduction of multiple components of Graduated Driver Licensing (GDL) could result in saving at least 4,478 casualties, which is considered to be a conservative estimation. In terms of absolute number of casualties, it would be more effective in the more populated and more urban regions, whereas when considering relative numbers, it would be more beneficial for rural regions. Limitations on passenger numbers (in general) and on driving between midnight and 5 a.m., would be welcomed by over 60% of British adults aged 16-75. In the group of employed young adults aged 17 to 19 years old who commute to work with the use of their own car, this amounted to 29% and in the group of 20 to 24 years old it was 46%.

- Graduated Driver Licensing has not currently been introduced as a government scheme in the UK. Whilst not a complete substitute, there is a role for parents in the first months after licensure. As the car key-keepers, parents' actual engagement in post-licensure driving development (through imposing rules and limitations on their children and their use of the car) could assist in those highly critical first months of driving.

## Methodology

A detailed description of the methodology used to produce this review is provided in the Methodology section of the Observatory website at: http://www.roadsafetyobservatory.com/Introduction/Methods.

This synthesis was compiled in August 2012. The latest update was made in September 2017.

Searches were carried out on the pre-defined sources identified in the methodology section. Basic search terms used to identify relevant papers included: young driver/s, novice driver/s, new driver/s, learning to drive, driver training, pre-drivers, maturity to drive, deviant driving.

In total, 43 pieces of research, statistical reports, or policy documents have been included in this review.

## KEY STATISTICS

This section reports on the latest confirmed statistics from primarily the National Travel Survey (NTS) and Reported Road Casualties Great Britain (RRCGB). Note that these data sources provide different age bands for data on young drivers (NTS for the 17-20 years old and for RRCGB, 17-24 years olds for the data collected after 2009).

### *Young licence holders*

National Travel Survey data indicates that the overall proportion of young adults with a full driving licence has decreased since the early 1990s. It also provides reasons for not learning to drive which vary according to age with main reasons including not being interested in driving and costs of driving. A study based on data from "Understanding Society – the United Kingdom Household Longitudinal Survey" (Berrington & Mikolai, 2014) provides information on licence holders' distribution according to sex and area type.

- In 2016, 73% of English residents aged over 17 were license holders. (Department for Transport, 2017).

- The proportion of young adults (aged 17-20) with a full driving licence has decreased since the early 1990s although this trend started to reverse in 2005, but it has levelled off in recent years. In 1995/97, 43% of those aged 17-20 held a full licence, compared with a low of 27% in 2004 and 31% in 2016 (Department for Transport, 2017).

- The share of full driving license holders among males aged from 17 to 19 living in urban areas other than the London area in 2009 amounted to 39% and in the case of females with the same socio-demographical characteristics - to 29%. Among London's inhabitants from the same age group, there is a difference of about 10 percentage points in the share of full driving license holders amongst men and women aged 17 to 19 years old. There was no apparent difference in the number of full driving license holders among male and female rural inhabitants aged 17 to 19 years old, almost every second person from these groups had a full driving license (Department for Transport, 2017).

- Only 7% of license non-holders aged 17 to 20 years old reject learning to drive, whereas 42% intend to start to learn to drive within the next year, 43% within the next 5 years (Department for Transport, 2017).

- The reasons for not learning to drive that were most frequently given as the main ones are: lack of interest (24%), cost of learning to drive (13%) and the possibility of sharing a lift by family or friends (12%). In the group of non-license holders aged 17 to 20 years old, lack of interest as the main reason was indicated by 14%, cost of learning to drive was the main reason for 29% and the possibility of sharing a lift by family or friends for 11% (Department for Transport, 2017).

### *Accessing a car*

In 2009, the chances of not owning a car were 216.5% higher for UK households where the eldest person was 16 to 24 years old than householders where the eldest resident was aged 45 to 59 years old. The chances of possessing 1 car were 51.8% lower in households with the eldest person aged 16 to 24 years old compared to households with the eldest person aged 45 to 59 years old. At the same time, the chances for transition from car-holders to car non-holders in 2010-2011 were 206.1% higher in households with the oldest person aged 16 to 24 years old than in households where the oldest person was aged 45 to 59 years old (Clark, Chatterjee & Melia, 2015).

In 2009-2010, 29% of employed young adults aged 17 to 19 years old were commuting to work by driving a car themselves and in the group of employed aged from 20 to 24 years old, this share amounted to 46% (Berrington & Mikolai, 2014).

### *Casualties in accidents involving young car drivers*

In 2015, nearly 15% of all car occupants killed or seriously injured were young car drivers aged 17-25 years. For this age group there were 120 fatalities in 2015, the same as in 2014, and a 13% fall from the 2010-14 average (Department for Transport, 2016). These reductions may reflect the proportion of young drivers with a licence which has decreased since the early 1990s.

The number of young drivers, other drivers, passengers and pedestrians involved in these accidents has also decreased. This may be due to the decrease in the number of young adults driving.

- In 2011, nearly a fifth of all car occupants killed or seriously injured were young car drivers.
- Young drivers aged 16-25 years were the only age group for which car occupant fatalities did not increase. For this age group there were 265 fatalities in 2011, a 6% fall from 2010 and 50% fall from the 2005-9 average.
- KSI young car drivers has decreased by 36% (to 1,552) from the 2005-9 average.
- Fatalities in reported accidents involving young car drivers accounted for 22% and KSI accounted for 20% of all road deaths in 2011.
- The number of fatalities in accidents involving young car drivers fell by 6% (from 437 in 2010 to 412 in 2011) which is a reduction of 25 deaths. This is compared with an increase in all car occupant deaths of 48 deaths (6%).
- The number of young drivers and passengers of young drivers killed decreased from the 2005-9 average by respectively 48 and 54%.
- KSI passengers of young car drivers have decreased by 45% and other casualties have decreased by 28%.
- The number of other casualties killed in accidents involving young drivers also decreased from the 2005-9 average by 39%.
- The reduction in of fatalities in accidents involving young drivers may be due to young adults driving less. The NTS data (reported above) shows that the number of young adults holding licences has fallen significantly since 2007.

In 2011, Department for Transport reported that young drivers in 2009 were over represented in car accident statistics:

- Of all accidents (in 2009), 26% (over 42,000) involved at least one young car driver aged 17 to 24 years. Young drivers accounted for 12% of all driving licence holders. Therefore, young car drivers were over represented in car accident statistics. In addition, they were over represented for all casualty severities (Department for Transport, 2011).

The latest confirmed data for young drivers involved in drink driving accidents comes from Reported Road Casualties Great Britain (Department for Transport, 2010). This data show that young car drivers aged 17-24 years were involved in more drink driving accidents than any other age group when exposure is adjusted for.

- Young car drivers (aged 17-24) had more drink drive accidents per 100,000 licence holders and per billion miles driven than any other age group.
- 25-29 year olds had the lowest proportion of killed drivers with no alcohol present (54%) and the highest proportion of killed drivers/riders over the legal alcohol limit.
- Those aged between 20-24 years had the second highest proportion of all killed drivers who were over the legal alcohol limit (30%) and the highest proportion for blood levels over twice the legal alcohol limit, followed by those aged 25-29.
- Between 2001 and 2009, the number of KSI passengers of young drivers over the legal alcohol limit was at its highest in 2003 (358), but by 2008 had fallen by more than half to 170. Between 2008 and 2009, the figures increased by 6% compared with a fall of 10% for KSI passengers of all young drivers. (Department for Transport, 2010).

***Who is injured in accidents involving young car drivers?***

RRCGB data from 2009 (Department for Transport) indicated that accidents involving young drivers were more likely to lead to a greater number of casualties compared with older drivers. Most of the young drivers involved in accidents were male. Men also made up a higher proportion of casualties in accidents involving young drivers.

- On average, a higher number of casualties resulted from a reported accident involving at least one young car driver. Young car driver accidents result in 1.56 casualties on average compared with 1.36 casualties for all reported accidents.
- Of the 2,026 young drivers involved in accidents, 71% were male. In comparison, 64% of the 5,260 older drivers (aged 25 years or older) involved in accidents were male.
- 55% of casualties resulting from young drivers' accidents were men. Specifically, males contributed to 66% of KSI casualties and 74% of fatalities. Similar patterns and percentages were observed for all accidents.
- Young people aged 17-24 year olds made up the majority of casualties in young driver accidents (57% of all casualties). Nearly a third of young car drivers involved in accidents were aged 18 or 19. Passengers injured in accidents involving young car drivers were of similar age as the young car driver. In accidents involving older drivers (aged 25 years and older), the KSI casualty age distribution was more evenly distributed. (Department for Transport, 2009).

### *When do accidents involving young car drivers happen?*

The timing of accidents in 2009 (Department for Transport) involving young car drivers mirrored the patterns of all drivers with most happening on Fridays and during morning and evening rush hours on weekdays. Although more young driver accidents happened on Friday and Saturday nights (8pm-4am).

- Most accidents involving young car drivers happened on Friday and the fewest accidents were reported on Sunday. However, most of the fatal or serious accidents occurred on Saturday. Compared with 2008, the largest reductions in fatal accidents occurred during weekends.
- On weekdays, most accidents involving young car drivers occurred during the morning and evening rush hours. On weekends, most young driver accidents occurred during the afternoon.
- A higher proportion of young driver accidents occurred between 8pm and 4am on Friday/Saturday and Saturday/Sunday (10%) compared with all accidents (7%). This accounted for a considerable number of young driver accidents even though the traffic flows during these periods were lower. (Department for Transport, 2009).

### *Where do accidents involving young car drivers take place?*

In 2009, most accidents involving young drivers took place in urban locations but were less serious than those in rural places. Young Drivers were also most likely to be driving straight ahead and most often were not at a junction. These proportions were only slightly higher than those for older drivers with the exception of negotiating a curve.

- The majority of reported accidents involving young car drivers happened in urban areas (57%); these accidents accounted for 55% of casualties in young driver accidents. In comparison, for all reported accidents, under two thirds of accidents (64%) and casualties (61%) were in urban areas, reflecting heavier traffic flows on urban roads.
- Young driver accidents in urban areas were on average less serious than those in rural areas; 8% of casualties in urban areas were killed or seriously injured, compared with 12% in rural areas. Slightly higher proportions were recorded for all accidents, but the patterns were similar.
- Young car drivers were most often driving straight ahead immediately before the accident (46%); the corresponding percentage was slightly lower for older drivers (43%).
- Negotiating a curve, bending left or right, accounted for twice the proportion of young car driver manoeuvres compared to older car drivers prior to an accident. The figures were 14% for young car drivers versus 7% for older car drivers.
- Young drivers were most often not at a junction when they were involved in an accident (43%); the corresponding percentage was 38% for older car drivers. (Department for Transport, 2011)

### *What are the contributory factors?*

In 2009, most accidents were attributed to ‘failed to look properly’, when a contributory factor was recorded (Department for Transport, 2011). Young driver accidents were also more likely to be attributed to factors related to inexperience, which reflects what is known about the relative importance of inexperience in causing young driver accidents. There were also differences in reported contributory factors for females and males. While impairment by alcohol was a contributory factor in a very small percentage of young driver accidents, young drivers were overrepresented compared with older drivers.

- Failed to look properly was the most frequently recorded factor for all ages of car drivers involved in accidents with at least one reported contributory factor.
- A much higher proportion of vehicles driven by young car drivers had 'learner' or 'inexperience' or 'loss of control' as contributory factors attributed to it compared with older car drivers.
- Factors such as 'careless, reckless' or 'in a hurry' and 'exceeding speed limit' were more often attributed to young male drivers compared with young female drivers. Young female drivers were slightly more frequently assigned factors such as 'nervous, uncertain' or 'panic' or 'failed to judge other person's path or speed', but the percentage differences between males and females were small.
- 'Impaired by alcohol' was attributed to 4% of young drivers, compared with 2% of older drivers. Young car drivers had more drink drive accidents per 100,000 licence holders and per 100 million miles travelled than any other age group in 2005. (Department for Transport, 2011).

### *International Comparisons*

An OECD study in 2006 reported that the risk of fatality for young drivers in the UK is similar in other OECD countries.

- Traffic crashes are the single greatest killer of 15-24 year olds in OECD countries. It is estimated that over 8,500 young drivers of passenger vehicles were killed in 2004. Death rates for young, novice drivers have decreased in many countries in recent decades. However, these reductions have mirrored overall improvements in road safety, and death rates for 18-24 year old drivers typically remain more than double those of older drivers.
- Data from the Netherlands, Sweden and the UK have shown that young male drivers' relative risk of crash fatality, compared with that of older drivers, has increased considerably over the last decade. This was measured by fatal accidents per million kilometres driven. (OECD, 2006).

## RESEARCH FINDINGS

Summaries of key findings are given below. Further details of the studies reviewed, including methodology and findings, and links to the reports are given in the References section.

### *Learning to drive and preparation for the tests*

Two studies investigating the learning to drive process (Wells, Tong, Sexton, Grayson & Jones, 2008; Emmerson, 2008) suggest that many young drivers were insufficiently prepared for the driving test mainly because they lacked enough and sufficiently varied driving experience (e.g. weather conditions, rural and urban roads). It seems that while most young drivers take some formal lessons, many do not engage sufficiently with the learning to drive process particularly in terms of using study materials and using their theoretical learning in their driving practice. For young drivers, becoming a driver seems to be first of all a manual skill, associated with car handling and its positioning among other vehicles in traffic. It is also worth noticing that young drivers seem to distinguish between preparing and driving during the driving test and driving after licensure, when you learn a “more natural” way of driving and “the real rules” of the road (Big Island Research and Planning, 2015). Overall, the evidence suggests that many young drivers do not develop a good understanding of safe driving as part of the learning to drive process.

A study of how a cohort of young adults learned to drive (Wells, Tong, Sexton, Grayson & Jones, 2008) in 2008 found that:

- Virtually all respondents (99%) took some lessons with an Approved Driving Instructor (ADI). For all respondents, the median value was 40 hours of lessons.
- Just over half (55%) were learning to drive had practice sessions with friends or relations.
- In contrast to preparation for the theory test, more than a fifth of respondents (22%) opted not to use any study materials to prepare for the practical test, although the Highway Code was still used by more than half of all respondents.
- A number of respondents failed to experience a full range of driving conditions when learning to drive, for example 6% of those who took the test, irrespective of the outcome, did not drive on country roads, 14% did not drive in darkness and 57% did not drive in snow or ice prior to taking their practical test. (Wells, Tong, Sexton, Grayson & Jones, 2008).

An evidence review of literature on learning to drive (Emmerson, 2008) found that:

- Learning to drive is not undertaken in an integrated way in that some drivers treat theory as separate from practice and professional lessons are not complemented sufficiently with on-road practice. This is problematic as on-road driving experience has been shown to increase road 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 (Emmerson, 2008).

A report on a workshop (Christmas, 2008) exploring young drivers' perceptions of 'good driving' and experiences of learning to drive found five segments of young drivers:

- Rule observers, for whom good driving is about following rules and standards;
- Risk minimisers, for whom good driving is risk-free driving;
- Good neighbours, for whom good driving is sociable driving;
- God's gifts, for whom good driving is confident driving; and
- Nightmare drivers, for whom good driving is entirely irrelevant. (Christmas, 2008).

A survey conducted in 2016 established that more than one third (36%) of drivers aged 17-25 took 41 or more driving lessons before taking the test. 45% had between 21 and 40 lessons and fewer than every fifth driver received 20 lessons or less (The co-operative insurance, 2016).

### *Passing the test*

Research on young drivers passing the driving test suggests that first time passers are more likely to be young males. Furthermore, the evidence indicates that first-time passers were likely to take less time to learn to drive and may be more likely to have an accident post-test. However, one study (Baughan, 2001) found that they have lower accident liability once age and exposure are controlled. The evidence also indicates that many young drivers overrate their driving ability and what may be considered 'safe driving' does not form part of this judgement. Also, a study suggests that young drivers may not see passing the test as a way of becoming a better driver and that being a good driver is a matter of 'natural talent' which can be assessed according to how confident the driver feels.

A study of how a cohort of young adults learned to drive (Wells, Tong, Sexton, Grayson & Jones, 2008) found that:

- Almost half of all respondents (49%) passed the practical test. The key characteristics of these respondents (or 'passers') were that:
  - A higher proportion of males than females passed, 55% and 47% respectively.
  - Females who passed were, on average:
    - older than males;
    - had more hours of tuition; and,
    - took longer to learn.
  - The proportion of people passing decreased with age.
  - Passers took a median of 36 hours of professional tuition. Although passers tended to have fewer hours of tuition if they were young.
  - Any amount of practice with friends and relations was associated with higher pass rates. Respondents were also more likely to pass the practical test if they reported fewer barriers to learning to drive (such as restrictions on private practice or professional tuition).
  - Passers learned to drive over a shorter period of time than those who attempted the test but did not pass.
- More than two-thirds (69%) of respondents who failed agreed with the examiner's decision. Respondents were most likely to cite 'nerves' and 'bad luck' as reasons for failing the practical test: 56% of respondents who failed the practical test claimed that they were too nervous to perform to the required standard and 44% claimed that they were just 'unlucky'. However, just over a quarter of those who failed (27%) acknowledged that their driving was simply not good enough on the day of the test and around 4% admitted that they were not ready for the practical test. However, in spite of not being successful, half of failed respondents (51%) did not think it was necessary to alter their learning pattern and they said they would continue to take professional tuition with the same frequency.
- Those who were taking the practical test for the first time were not as successful as those who were attempting their second, third or fourth driving test.

A study examining the accident history and behaviours of young drivers who pass their first driving test (Sexton, 2010) found that:

- Those taking the practical test for the first time were predominantly young (the majority being less than 19 years of age), and a high proportion were males.
- First-time passers took fewer theory tests than did those who had failed a previous practical, and achieved higher scores on both the multiple choice and the hazard perception components. However, their pass rate was lower than that of those taking a second, third, or fourth test.
- First-time passers as a group are even younger, with nearly 50% being 17 years of age, and again with a high proportion of males. The first time taking 17 year olds have the highest pass rate of 59%, as compared to 49% of all first-time takers.

- Male first-time passers tend to drive more miles in the first three years of driving than either females or non-first-time passing males, and have a slightly higher rate of public road accidents, even after adjusting for mileage. However, drivers who pass the driving test the first time have a lower accident liability rate than those who take more than one test.
- Drivers who pass their driving test the first time have been shown to have a lower accident liability rate. However, their driving style, which was characterised as 'decisive, experienced, confident and fast' has been associated with a less safe driving style. While these drivers reported being more confident about their driving abilities they also reported more driving violations. (Sexton, 2010)

Research conducted in 2016 indicates that for half of drivers aged 17-25 usually one attempt was necessary to pass the driving test, 38% needed to take two to three tests and 12% took four or more tests (The co-operative insurance, 2016).

A report on a workshop (Christmas, 2007) investigating the impact of young drivers' attitudes on their driving found that:

- Most took the view that it is only after the test that one really starts to learn to drive. This post-test learning is seen as a process of learning from experience. Learning from experience can happen as a result of observing others driving, but, for the most part, it is seen to be about learning from one's mistakes. Findings from a study conducted in 2014 support the hypothesis that young people tend to perceive the learning to drive as a process that continues after passing the test. Nevertheless, the entire process does not seem to be a "linear" one, since there is a distinction between preparation and driving during the driving test and learning to drive after passing the test, which is more "natural" and a stage when they learn "the real rules of the road" (Big Island Research and Planning, 2015).
- Drivers who are low in confidence experience the loss of their instructor as a negative event. Drivers who are high in confidence experience the loss of their instructor as a release. Two kinds of possible explanation for the over confidence of many young drivers were identified. First, many participants took the view that driving ability is a matter of natural talent. Secondly, participants (mostly but not only young men) emphasised the extent to which their own behaviour was influenced by the need to build and maintain a particular image and identity for themselves. (Christmas, 2007)

### *Attitudes towards driving*

The research evidence on young drivers' attitudes suggests that these are important to understand from a road safety perspective. A report on a workshop (Christmas, 2007) investigating the impact of young driver' attitudes on their driving found that participants defined being a good driver according to physical, social and emotional dimensions (set out below). Interestingly, being law-abiding was only included in this definition by a small number of participants.

- **Driving as a physical activity** was about safely controlling and guiding a physical object through a complex environment (controlling the car, reading and reacting to road conditions, reading and anticipating other drivers)
- **Driving as a social activity** was about operating in a shared space in a way that ensures everyone is kept happy, and in a way that builds and maintains a desired image of oneself as a driver.
- **Driving as an emotional activity** was about preserving an appropriate frame of mind to drive well in the face of distractions and annoyances (right level of mental alertness and assertiveness).
- The study also showed that a small number of people included being law-abiding in their definitions of good driving, but this was disputed by others. The majority perspective was that the laws and rules of driving were things to be followed not for their own sake, but only:
    - If they were judged to be genuinely relevant to the safety of driving as a physical activity
    - If they coincided with what were believed to be the norms of driving as a social activity
    - In order to avoid penalties.

Driving is generally perceived by young people as a certain "rite of passage" to adulthood (Green, Steinbach, Garnett, Christie & Prior, 2017) and key to independence, giving them a feeling of freedom, independence and in more practical terms – making day-to-day life easier (Big Island Research and Planning, 2015).

A study on pre-driver educational interventions found that:

- Young people appear to have relatively well-developed attitudes towards driving, riding, and being a passenger. Attitudes towards driving are present in children as young as 11 years olds. (Pre-driver Education: A critical review of the Literature on Attitude Change and Development, Good Practice in Pre-driver Education and Programme Effectiveness)

### *Accessing a car*

Owning a vehicle is often out of reach for many young people and those young peoples' households who succeed in acquiring one seem to be far more likely to convert to car non-holders than the households, where the oldest person is aged 45 to 59 years old. However hard it would be to determine the causality direction, it is worth noticing that some research suggests that young peoples' attitudes to automobility and car usage are shifting.

- In 2009, the chances of not owning a car were 216.5% higher for UK households where the eldest person was 16 to 24 years old than householders where the eldest resident was aged 45 to 59 years old. The chances of possessing 1 car were 51.8% lower in households with the eldest person aged 16 to 24 years old compared to households with the eldest person aged 45 to 59 years old. At the same time, the chances for transition from car-holders to car non-holders in 2010-2011 were 206.1% higher in households with the oldest person aged 16 to 24 years old than in households where the oldest person was aged 45 to 59 years old (Clark, Chatterjee & Melia, 2015). Whereas the idea of independence, freedom and a step to adulthood still seem to resonate with the driving activity (Big Island Research and Planning, 2015, Green, Steinbach, Garnett, Christie & Prior, 2017), a transition of attitudes to car usage may be observed. The glamour of car ownership seems to be fading and the car becomes more a space for sharing and a platform of interdependencies than an individual good and expression of independence (Green, Steinbach, Garnett, Christie & Prior, 2017).
- On the other hand, in some social situations, the car remains a way of self-expression for young people and it is not only about acquiring and possessing a car of a certain brand but also to distinguish their own car from the traffic "mainstream" via implementing alterations to standard car settings, using symbols and making aesthetical changes (Lumsden, 2015).

### *Aberrant behaviours*

Adolescence is a time when hampering deviant behaviours is particularly difficult as young people are in the developmental stage characterised by greater reward sensitivity (Scott-Parker & Weston, 2017) and the stage when it has to deal with a certain delay in emotional regulation and susceptibility to emotional distortions. Both the negative and the positive emotions can have detrimental impacts on avoiding risky behaviours. The negative ones make the delays in recognising hazards more likely, whereas the positive ones are associated with decreased risk appreciation. In the case of adolescent drivers with peer passengers, car driving may appear to be not an entirely independent activity, since emotional influences are more likely to play a role in their presence, as they can provide immediate social rewards (Scott-Parker & Weston, 2017).

The vast majority (98%) of drivers aged between 17 to 25 years old define themselves as safe drivers and of these, 42% as very safe drivers. Research conducted in 2014 concluded that they do not perceive themselves as a group at high risk and they attribute young drivers' collisions to the reckless few. Speeding was indicated as the main risk, nevertheless, justifiable in some circumstances. At the same time multi-tasking was seen as a generally acceptable risk (Big Island Research and Planning, 2015).

A workshop with drivers aged from 17 to 25 years old, conducted in 2007, revealed that some young people felt that alcohol would reduce mental alertness or increase aggression, and so make a worse driver, but that cannabis, by reducing aggression, might make one a better driver. In fact, there is evidence that both these drugs have a safety disbenefit in driving. (Christmas, 2007)

When analysing norms of motorists aged between16 to 29 years old from England and Wales surveyed in 2013, it was noticeable that they were more likely to approve of behaviours such as: using a mobile phone to text while driving; driving without a hands free kit; driving too fast for conditions; driving when unsure if over the alcohol limit; driving after two pints; driving when too tired; and driving at 40mph in a 30mph area (TNS BMRB, 2013). However, in some young peoples' social circles, deviant driving and challenging the norms is not only not denied but it is a way of self-expression (Lumsden, 2015).

Analysis of novice drivers' behaviours in the United Kingdom reveals that across the first three years after licensure, aberrant behaviours such as aggressive violations, ordinary violations, errors and slips appear to increase (e.g. Wells, Tong, Sexton, Grayson & Jones, 2008) which is the case for all subsets of drivers and is particularly noticeable for males and younger drivers (Roman, Poulter, Barker, McKenna, Rowe, 2015).

A survey which was conducted from 2001 to 2005 concluded that learner drivers with a more tolerant attitude to driving violations (many of them speed-related) tend to go on to have a higher post-test accident liability, based on measures from the Attitudes to Driving Violations Scale (ADVS). (Wells, Tong, Sexton, Grayson & Jones, 2008)

### *Accidents*

Evidence from a variety of sources suggests that some young driver characteristics are more likely to be associated with unsafe driving and/or accident liability. These include younger age and particular personality characteristics (e.g. sensation seeking, external locus of control). Having an accident may also lead to changes in driving style. In one study, young drivers who had been involved in an accident reported that their driving was less confident afterwards and for female drivers, also less decisive and more prone to errors.

- In the first six months of driving after passing the test, older drivers have a lower reported accident rate (per year) than younger drivers. ( Wells, Tong, Sexton, Grayson & Jones, 2008)

- Adolescents approaching the age where they could seek a driving licence may also be both more prone to emotional over-reaction in risky environments and less able to suppress appealing actions. Risk taking is a natural part of adolescent development, but some teenagers are more prone to it than others, and some develop lifestyles of multiple risk-taking. These patterns, established in early to mid-adolescence, are significant precursors of risky driving and crashes in early adulthood. (Durkin, Tolmie, 2010)
- There is extensive evidence from studies of adults that personality characteristics such as sensation-seeking, external locus of control, impulsivity and aggressiveness are predictive of risky driving; in contrast, the attributes of altruism, anxiety, and conscientiousness tend to be associated with safer driving. (Durkin, Tolmie, 2010)
- Drivers in the Cohort II study who were involved in accidents were found to modify some of their driving behaviours and attitudes. In particular, female drivers who were involved in an accident were aware that they were less decisive, less confident, made more errors and slips and were less aware in the period following an accident than they had been previously, Male drivers who were involved in an accident reported being less confident after the accident than they had been before it. (Sexton, 2010)
- Figures provided by the Association of British Insurers to the Transport Committee inquiry on novice drivers in 2007, showed that unlike novice drivers, supervised learners make the same proportion of claims as the general driving population; their crash risk is no higher. Where male supervised drivers differ from the general driving population, is in the cost of their claims, which are higher than the general driving population, but still much lower than that for novice drivers. It should be noted, however, that female supervised learners have a lower average claim cost than males in the overall driving population (although their average premium is still noticeably higher than that for the overall male group). (House of Commons, 2007)
- DVLA records show that about 7,500 novice drivers lose their licence each year for driving without insurance. These figures only include novice drivers who have been caught and convicted. Only about half of the drivers who have their licence revoked ever properly become relicensed. (House of Commons, 2007)

***Training***

A range of studies identify problems related to the training of young drivers, mainly related to the lack of motivation of young drivers to take responsibility for improving their driving. This is related to the content of driver training which does not address driving on a cognitive and attitudinal level. Suggestions for how to address these problems related to young driver attitudes and perceptions of driving are identified in some studies. These include tapping into parental influence and working with young drivers' perceptions of safe driving, 'good driving' and driving cultures – for example, the social and emotional aspects of driving identified in the study of Christmas (2007).

- 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. In order to improve their safety on 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. (Emmerson, 2008)
- 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. ( Emmerson, 2008)
- More research is needed on the relationships between skill and perceived ability at different stages of the driving career, and on what promotes shifts towards self-regulated skill development. (Durkin, Tolmie, 2010)
- The practical test focuses too much on a candidate's ability to control the car safely at the expense of other knowledge and skills. (Emmerson, 2008)
- Four broad areas of intervention were identified which could start to turn young drivers' perspectives on driving from a problem into the basis for solutions:

  1. **Reposition the rules.** Young people have a real appetite to learn the 'real rules of driving'. A campaign drawing lessons from the 'Frank' approach to drugs could help to provide information and guidance to young people in a form they would be motivated to absorb and act on.

  2. **Co-opt the culture.** Over-confidence can be challenged by making the images or identities that these young people are seeking to project seem undesirable, ridiculous or shameful.

  3. **Tackle the talent model.** The impact of the talent model might be reduced by doing more to emphasise the social and emotional aspects of driving, and qualities such as wisdom and maturity, in driver learning and testing.

  4. **Re-think the test.** Opportunities for young drivers to interact with each other, think about what good driving means to them or consider how they will continue learning after the test may all have a place in a revised approach which addresses driver development alongside driver training and driver education. (Christmas, 2007)

- Parents are an important long-term influence on young drivers' behaviour, and there is a need to encourage parents to reflect on what messages they send to their children about driving and road safety. Information and education should include efforts to identify and publicise the positive behaviour of adolescents and young drivers, and to portray peer norms as pro-safety. (Durkin, Tolmie, 2010)
- Any policies concerning pre-driver education should take into account that 'one size fits all' approaches will not map onto the characteristics and needs of all members of target groups. (Durkin, Tolmie, 2010)
- Four critical gaps in current approaches to driver learning and testing are evident:

    1. **The relevance gap.** Few young people – pre-drivers, learners or novices – see the standards in the test (and other rules of driving) as relevant to 'real driving'.

    2. **The measures gap.** Young people have no good way of measuring the competence of other drivers other than their own feeling of safety, and have no good way of measuring their own competence as drivers other than their feeling of confidence.

    3. **The incentives gap.** There are a number of disincentives for young people to spend longer improving their driving pre-test, and few real incentives to carry on getting better after passing.

    4. **The motivations gap.** A number of young people do not see any real need to get better, as they start the learning process already confident in their own talent which is reinforced by their rapidly mastering physical control of the car. (Christmas, 2008)

### *Young riders*

The evidence on young motorcycle riders suggests that most young riders are male and one study (Rutter & Quine, 1996) suggests that young age plays a significant factor in young riders being over-represented in casualty statistics. However, this study also highlights the importance of training that addresses attitudes and perceptions to riding in reducing accident risk. Other evidence suggests that some riders may be at particular risk of accidents as a result of overtaking and rear-end shunts.

- Young male motorcyclists were the heaviest users in terms of both the average number of trips they made (10 per rider per week) and distance travelled (77 miles). (Clarke, Ward, Bartle & Truman, 2004)
- Rutter and Quine (1996) looked at age and experience in motorcycling safety, and from a national prospective survey of over 4000 riders in the UK found that age played a much greater role than inexperience in explaining why young age groups are over-represented in casualty statistics. Rutter and Quine explain that more emphasis should be given to the consequences of dangerous riding and why training, when related to rider 'beliefs and perceptions' (p.9), is so important.
- Riders, particularly younger riders on high-capacity machines, can be presented with overtaking opportunities that they find hard to resist (as with the riders investigated by Mannering and Grodsky, 1995). Riders of 'super-sport' classes of motorcycles who are aged under 25 years have approximately a third more overtaking accidents in which they are at fault than do riders of similar machines who are over 25 years of age. (Clarke, Ward, Bartle & Truman, 2004)
- In the case of rear-end shunts in particular it was observed that riders at fault in this kind of accident were far more likely to be young, relatively inexperienced riders on small engine capacity scooters and mopeds. (Clarke, Ward, Bartle & Truman, 2004)

## How effective?

### *Education, training and testing of drivers*

Overall, the evidence suggests that pre-driver, driver education and training provision and testing is not sufficiently effective in helping young drivers to drive safely and reduce accident risk. The evidence to support this come from a range of reviews of evidence (Helman, 2010; Baughan, 2001) and primary research studies discussed in the research findings section (particularly Wells, Tong, Sexton, Grayson & Jones, 2008 and Emmerson, 2008). Because the accident rates of young drivers are higher in the initial post-test period and declines sharply thereafter, gaining driving experience post-test is the main cause of the reduction of young driver accidents. Of course, this means that young drivers are at continued risk in the immediate post-test period and training and education measures do not seem to have a direct impact on reducing this risk.

- The weight of evidence from the literature as a whole is overwhelmingly in favour of the conclusion that driver education and training has little or no direct effect on the collision risk of new drivers. (Helman, 2010)
- There is little research evidence that increased formal driver training improves safety. A number of themes have emerged that offer the hope of improving the effectiveness of training, one being the desirability of improving the hazard perception skills of learner drivers. Developing and evaluating improved driver training is now an important research task. (Baughan, 2001)
- 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. (Emmerson, 2008)
- Risky driving behaviours and factors related to these, such as speed choice, which has been shown to be linked with accidents, are not effectively addressed in the driving test. This contributes to the failure of the driving test in helping to produce safe and competent drivers. (Emmerson, 2008)
- A survey of pre-driver educational provision reported that out of 173 UK road safety teams, 122 (71%) had a pre-driver education initiative in place and 51 (29%) did not. The survey was carried out over a two-month period, where the study team collected and reviewed papers and contacted key researchers within national and international academic establishments. (Pre-driver Education: Survey of Pre-driver Education Provision)
- Although there is an independent effect of age on collision risk - the youngest new drivers have on average the highest risk - the effect of post-licence experience is the dominant factor in lowering the collision risk of new drivers. (Helman, 2010)
- More recent approaches to driver training that treat driving as a cognitive skill show much more promise. One method within this cognitive approach that shows considerable promise is the training of hazard perception skills (Helman, 2010).
- In 2017, experts commissioned by the Department for Transport reviewed hazard perception training conducted since 2005 and recommended it as one of four interventions with the greatest potential for reducing young driver risk.

One concern raised was related to the possible uptake of such intervention. It was also recommended that the hazard perception training is delivered late in the learning to drive process, or just after passing the practical test (Pressley, Fernández-Medina, Helman, McKenna, Stradling & Husband, 2017).

- It has been that: “Having access to a vehicle owned by parents, relatives or friends (during the post-test period), higher confidence, reported likelihood of avoiding risky driving situations, and time spent with a driving instructor on country roads or driving independently while learning were all associated with lower collision risk post-test. Time spent driving in busy town centres, frequency of driving for work, and being named on a ‘telematics’ insurance policy were all associated with higher collision risk post-test.” (Helman, Wallbank, Chowdhury, Hammond, Kinnear, Buttress, Jenkins & Grayson, 2017, p. 7).
- In 2017, experts approved by the Department for Transport recommended four types of interventions for properly controlled scientific evaluation in a future trial in GB. These were: interventions engaging parents in managing post-test driving in specific situations; interventions engaging a range of stakeholders (and utilising a logbook approach) in increasing the amount and breadth of pre-test on-road experience; interventions utilising technology (IVDRs) and possibly parents as well to manage driver behaviour post-test; and interventions to train hazard perception skill (Pressley, Fernández-Medina, Helman, McKenna, Stradling & Husband, 2017).
- Recent research has identified that most pre-driver and young driver educational interventions do not have the desired impact and that this could be because of an absence of appropriate behaviour change techniques (BCTs). A review set out to investigate which BCTs were most commonly associated with effective interventions in other areas of public health. The review found strong evidence regarding the efficacy of BCTs related to goal-setting; self-monitoring of behaviour; proving information on consequences; social support; providing instruction’ and providing feedback on performance. It was recommended that these BCTs were incorporated into young driver interventions to improve the changes of successfully achieving behaviour change. (Sullman, 2017)

### *Young riders*

- There are two main groups of motorcycle riders that interventions should be focussed on. The first is young and inexperienced riders of smaller capacity machines such as scooters, and the second is older, more experienced riders of higher capacity machines. Both the skills and attitudes of these riders need to be addressed (Clarke, Ward, Bartle & Truman, 2004).

### *Graduated driver licensing*

Reviews (e.g. Russell, Vandermeer & Hartling, 2011) of Graduated Driver Licensing (GDL) suggests that these systems have been effective overall (though the size of the effect varies between jurisdictions). The effectiveness of GDL is mainly related to the reduction of exposure to driving conditions (e.g. driving at night and with other young passengers) which present a risk to young drivers.Analysis of the potential effects of introducing multiple components of GDL in Great Britain (Kinnear, Lloyd, Scoons & Helman, 2014), suggests the possibility of saving over 4,000 casualties and this is considered to be a conservative number.

- A graduated licensing system aims to provide a staged progression from initial learning to unrestricted solo driving by means of measures designed to restrict exposure during early driving, exert a supervisory influence over driving behaviour during the first part of a driver's solo driving career or improve the level of training and experience accumulated before driving solo without restrictions (Baughan, 2001)
- The weight of evidence for the effectiveness of graduated driver licensing comes from the restricted period of driving post-licence, and these effects are likely to be largely related to exposure. Because people are simply not being exposed, on their own, to the higher risk situations in the restricted period they are much less likely to have collisions in this period. (Helman, 2010)
- A Cochrane review (Hartling, Wiebe, Russell, Petruk, Spinola & Klassen, 2004) of graduated driver licensing evaluated 12 GDL programmes that were implemented between 1979- 1998. Reductions in crash rates were seen in all jurisdictions and for all crash types. However, the magnitude of the effect is unclear.
- An updated version of the above Cochrane review (Russell, Vandermeer & Hartling, 2011) which reviewed 21 GDL systems concluded that overall GDL is effective in reducing crashes of teenage drivers. However, the size of the effect varies according to the components of GDL in each jurisdiction. Further research on GDL should focus on which combinations of components are most effective.
- A study (Jones, Begg & Palmer, 2012) assessed the likely casualty and cost savings of introducing two possible types of GDL systems in GB. It analysed police road crash data to identify crashes occurring at night and with passengers in order to estimate potential crash reduction rates. A stricter form of GDL was estimated to prevent 114 deaths and 872 serious casualties per year. A less strict system was estimated to prevent 81 deaths and 538 serious injuries. These estimates are based on a series of assumptions, such as a 50% compliance rate. Therefore, these findings should be treated with caution.

- A more up-to-date study (Kinnear, Lloyd, Scoons & Helman, 2014) estimates that the introduction of multiple components of GDL in GB would save over 4,478 casualties, of which about 443 could be classified as killed or seriously injured. However, these savings are probably underestimated since analysis was limited to drivers aged 17- to 19-years old. In the case of more populated and more urban areas it would result in saving the greatest absolute numbers of casualties, whereas when analysing relative effects, the benefits would be more apparent for rural regions. It was also proven that extended curfews in the night-time component of GDL (no permission to drive without the company of adults over 25 between 9 p.m. and 6 a.m.) would be considerably more effective in reducing collisions and casualties than the limited version (no permission to drive without the company of adults over 25 between midnight and 5 a.m.). Similarly, the implementation of a strong passenger component of GDL (no permission to drive with 15-24 years old passengers unless accompanied by a passenger aged over 25) appears to be more beneficial than the weaker component (no permission to drive with more than one 15-19 years old passenger unless accompanied by a passenger aged over 25).
- The idea of graduated driver licensing, in general, would enjoy the support of 68% of British aged 16-75. Among British respondents aged 16-24, the share of those supporting this idea amounts to 41%, whereas 32% are against such policies. Implementation of the night-time component with a curfew on driving between midnight and 5 a.m. without the company of passengers over 24 was supported by 61% of Britons and limiting passengers aged 15- to 19- years old to only one person (unless there is at least one passenger aged 25 or more) was backed by 66%.

An earlier review of GDL in 2001 (Baughan, 2001) reported the following findings:

- ***Night-time restrictions*** – there is evidence that these can be very effective at reducing night-time accidents, at least during the months covered by the restricted licence, though effectiveness will depend on the level of enforcement.

- ***Passenger restrictions*** – given the association between passengers and accidents, particularly amongst teenage drivers, introducing passenger restrictions for drivers when they first begin driving unsupervised is an option that merits serious consideration. Social effects, and the possibility of young people transferring to less safe forms of transport, or making car journeys as car drivers rather than passengers, would need to be taken into account before a decision were made.

- ***Increasing penalties for traffic violations*** - The British system of reversion to L-driver status for drivers who accumulate six penalty points during their first two years of unsupervised driving is an example of such a provision. Such measures can be seen as a way of maintaining a supervisory influence on novice drivers during their period of early solo driving. There is, as yet, little evidence on their effectiveness, but they are relatively simple to introduce and are attractive in that they seek to address the motivational components of the novice driver safety problem.

- ***Probationary licences and exit tests*** - The British licensing system already includes a two-year probationary period after the full driving licence is granted. Simply adding an exit test to the end of this period does not have much to recommend it at present. This conclusion might change if more severe, risk-reducing restrictions were to be imposed during the probationary phase.

- While not necessarily a feature of GDL, Increasing the amount of onroad driving experience accumulated by learner drivers – has generally been shown to reduce novice drivers' accident risk. Sweden achieved very large increases in the amount of pre-test experience, and substantial improvements in novice driver safety, from reducing the minimum learning age to drive from 17.5 to 16 years. Results from Norway have been less encouraging though.

- Given the problems of alcohol related accidents amongst novice drivers, imposing lower limits on young or novice drivers is likely to bring benefits and may also instil safer drink-driving habits after the restricted period ends. In Britain, enforcement of a differential limit for novice drivers would be difficult in the absence of a requirement to carry licences or identity cards. Drink driving is more prevalent amongst those in their early 20s than it is amongst teenage drivers largely because the mileage of the over-20s is higher. It may therefore be counterproductive to have a lower limit for novices, who would then see the limit raised just as they moved into the group in which the drink-driving problem peaks. (Baughan, 2001)

However, it should be noted that the Jones, Begg and Palmer (2012) study (referred to above) argues that adding a 'no alcohol' consumption restriction to a GDL system in GB, would increase the potential benefits of GDL. This is because a higher proportion of young drivers involved in crashes failed a breath test compared to all drivers.

Experiences of other countries show that reductions in crash rates were seen for all crash types, however, the magnitude of the effects vary. Stricter schemes appear to result in greater reduction of fatality numbers (Russell, Vandermeer & Hartling, 2011).

## APPENDIX A – REFERENCES

(Projects are ordered by date of publication, with most recent first.)

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| **Title: Sensitivity to reward and risky driving, risky decision making, and risky health behaviour: A literature review** |
| **Published:** Scott-Parker, B., Weston, L. (2017, August). *Transportation Research Part F: Traffic Psychology and Behaviour, 49*, 93-109.<br><br>**Link:** http://www.sciencedirect.com/science/article/pii/S1369847817303650?via%3Dihub |
| **Objectives:** The objective of the study was to develop an understanding of the relationship between reward sensitivity and risky driving, between reward sensitivity and risky decision making and between reward sensitivity and risky health behaviours and to identify avenues of effective interventions in young driver road safety. |
| **Methodology:** Basic search terms were: 'reward sensitivity', 'sensitivity to reward', 'risk', 'reward AND behaviour' and their variations. Explored databases were: PsychINFO and Science Direct. Articles with a publication date up to 15 September 2014 were considered. |
| **Key Findings:** Individuals with greater reward sensitivity generally were found to engage in risky driving behaviours, risky decision making, and other risky health-related behaviours in greater rates than individuals with lower reward sensitivity. Males and adolescents were found to exhibit greater reward sensitivity. When coupled with an attentional bias towards being rewarded in the presence of peers, it becomes particularly problematic for road safety. |

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| **Title: A review of interventions which seek to increase the safety of young and novice drivers** |
| **Published:** Pressley, A., Fernández-Medina, K., Helman, S., McKenna, F., P., Stradling, S., Husband, P. (2017, August). *Transport Research Laboratory.*<br><br>**Link:**<br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/609828/interventions-to-increase-young-and-novice-driver-safety.pdf |
| **Objectives:** The primary objective was to identify interventions aimed at improving the safety of newly qualified drivers, that have the greatest potential to reduce the collision rates. |
| **Methodology:** A range of search terms combinations were applied to identify potential articles. The review concerned interventions conducted from the year 2000 until the point at which the review was conducted (September 2015). The 402 articles were assessed by the research team. Selected interventions were then discussed within workshops with experts approved by the Department for Transport. |
| **Key Findings:** Four types of interventions were recommended for properly controlled scientific evaluation in a future trial in GB: interventions engaging parents in managing post-test driving in specific situations; interventions engaging a range of stakeholders (and utilising a logbook approach) in increasing the amount and breadth of pre-test on-road experience; interventions utilising technology (IVDRs) and possibly parents as well to manage driver behaviour post-test; and interventions to train hazard perception skill. |

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| **Title: Transforming the practical driving test** |
| **Published:** Helman, S., Wallbank, C., Chowdhury, S., Hammond, J., Kinnear, N., Buttress, S., Jenkins, R., Grayson, G. (2017, July). *Transport Research Laboratory.*<br><br>**Link:**<br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/640646/transforming-the-practical-driving-test-research-report.pdf |
| **Objectives:** The aim of the study was to evaluate the impact of the revised practical driving test (based on changes proposed by the DVSA in 2014) on drivers' experience on learning to drive, changes in attitudes, driving style and crash involvement. |
| **Methodology:** Data were collected with the use of standardized interviews with learner drivers who had not taken the driving test before. Participants were invited by approved driving instructors from 32 test centres across Great Britain. Learners were then assigned either to the control group (supposed to take the existing practical test) or treatment group (supposed to take the revised practical test) on a pseudo-randomised basis. Instructors were informed on the test type to which each of the participants was assigned, and were asked to instruct them accordingly. The first survey was conducted after passing their test and it was completed by 2,315 learners and the second one six months later and was filled in by 2,066 participants. In order to test for potential bias effects, national comparison was conducted additionally. The first survey, in July 2016, was filled by 1,202 learners after passing their test and the other one after six months was completed by 593 respondents. |
| **Key Findings:** There were no differences in the attitudes, confidence and driving style at six months post-test between British drivers who experienced the revised test (based on changes proposed by the DVSA in 2014) and those who received the existing one. It was also noted that: "Having access to a vehicle owned by parents, relatives or friends (during the post-test period), higher confidence, reported likelihood of avoiding risky driving situations, and time spent with a driving instructor on country roads or driving independently while learning were all associated with lower collision risk post-test. Time spent driving in busy town centres, frequency of driving for work, and being named on a 'telematics' insurance policy were all associated with higher collision risk post-test." (Helman, Wallbank, Chowdhury, Hammond, Kinnear, Buttress, Jenkins & Grayson, 2017). |

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| **Title: National Travel Survey: England 2016** |
| **Published:** Department for Transport (2017, July).<br><br>**Link:**<br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633077/national-travel-survey-2016.pdf |
| **Objectives:** Survey was conducted to identify patterns and habits of personal travelling by residents of England travelling within Great Britain, from data collected via interviews and a one-week travel diary. |
| **Methodology:** Face to face interviews with all members of the household and data recorded by each household member concerning all trips over a seven-day period in a travel diary. During 2016, 6,656 households in England participated fully in the research, i.e. responded to the interview and completed the diary. An additional 672 households participated in the interviews but did not all complete the diary. |
| **Key Findings:** In 2016 73% of English residents aged over 17 were license holders. Whereas among older age groups, the proportion of license holders has increased since 1992/94 (by at least 20 ppt among groups aged over 60), the share of adults aged 17-20 years old with a full driving license has declined since 1992/94 from 48%, when it was highest for this group, to 31% in 2016 (about 13.8 million people). In the group of males, it was a drop from 55% to 33%, whereas among females - from 42% to 29%. The main reason indicated by license non-holders aged 17 to 20 years old is lack of interest in driving (14%), cost of learning to drive (29%) and the possibility of sharing a lift by family or friends (11%). Only 7% of license non-holders aged 17 to 20 years old reject learning to drive, whereas 42% intend to start to learn to drive within the next year, 43% within the next 5 years. |

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| **Title: Emotions, behaviour, and the adolescent driver: A literature review** |
| **Published:** Scott-Parker, B. (2017, June). *Transportation Research Part F: Traffic Psychology and Behaviour*, *50*, 1-37.<br><br>**Link:** http://www.sciencedirect.com/science/article/pii/S1369847816303382 |
| **Objectives:** Article aimed at summarising the literature on the subject of adolescent emotions, behaviour (with particular respect to the road situations) and their interrelationships. |
| **Methodology:** Review of peer-reviewed articles devoted to the subjects of emotions, behaviour and the adolescent driver. 103 peer reviewed articles on adolescents' emotions, behaviour and driving were considered. The subject of 44 of them were emotions and the adolescent; 23 of them concerned emotions, the adolescent and driving risks; 30 articles were devoted to emotions, the adolescent and risky driving behaviour; and 6 of them pertained to the adolescent and road safety interventions. |
| **Key Findings:** Due to the process of cognitive development the adolescents are undergoing, their behaviour is highly susceptible to emotional distortions that can appear while being on the road as well as before entering the car. They can be facilitated by the type of driver's personality as well as by the driving environment. Negative emotions and traits related to the 'Type A' personality are considered to contribute to undertaking risky behaviours. Their throttling may be difficult, since adolescence is characterised as a developmental stage when certain delay in emotional regulation is observed. Nevertheless, the negative emotions are not the only ones that can heighten exposure to road hazards. Whereas they have particular behavioural aftermaths and are found to delay hazard perception, the positive effects are on the other hand associated with decreased risk appreciation. Peer passengers are considered to be particularly influential in this context, since they are a salient, immediate and emotionally-charged source of social rewards and thus also a source of certain behaviours' reinforcement. |

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| **Title: Automobility reconfigured? Ironic seductions and mundane freedoms in 16–21 year olds' accounts of car driving and ownership** |
| **Published:** Green, J., Steinbach, R., Garnett, E., Christie, N., Prior, L. (2017, June). *Mobilities.*<br><br>**Link:** http://tandfonline.com/doi/full/10.1080/17450101.2017.1331017 |
| **Objectives:** The aim of the paper was to develop an understanding of contemporary enrolment to automobility by exploring the practices and desires of people aged 16-21 and their parents. |
| **Methodology:** 17 group interviews held with seventy people aged 16 to 21 year olds and 4 group interviews with fourteen parents. Groups of young people consisted of people who knew each other. Recruitment was conducted through community groups and local gatekeepers, with individuals identified asked to invite a small number of friends or colleagues. It was conducted in the areas outside the metropolitan centres of United Kingdom with over-recruitment from Northern Ireland. |
| **Key Findings:** It was concluded that classical meanings ascribed to automobility such as independence, freedom and autonomy, are still present in the narrative, but are reconstructed by young people. Car usage is not entirely narrowed to car owning and *independence* but also to car sharing and *interdependencies*. It is positioned not only as a desirable object in itself and an item of conspicuous consumption but a part of options in a mixed economy and a mundane tool which enables access to fundamentals of subsistence life, i.e. work, apprenticeship and social events. Driving is perceived as a potential contribution and service for interdependent local communities which also requires financial collaboration. A car is considered merely as a space for enjoying company than a platform for the individual traveller. Car ownership has lost much of its glamour and is framed by mundane responsibilities of acquiring financial resources and gaining skills to deal with risks on the road. |

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| **Title: Young Driver Safety: A review of behaviour change techniques for future interventions** |
| **Published:** Sullman, M. (2017, March). RAC Foundation.<br><br>**Link:**<br>http://www.racfoundation.org/assets/rac_foundation/content/downloadables/Young_driver_safety_a_review_of_behaviour_change_techniques_for_future_interventions_MSullman_March_2017.pdf |
| **Objectives:** The aim of the review was to evaluate the evidence to support the different types of behaviour change techniques in other areas of health, in order to inform the development of road safety interventions aimed at young novice drivers and pre-drivers. |
| **Methodology:** A literature review was undertaken to identify articles in the health domain which referred to behaviour change techniques (BCTs). The focus was on recent studies that had been used to change behaviour with regard to obesity, physical exercise, diet and nutrition, as well as drug use. The original intention was to focus on adolescent behaviour, but in order to increase the evidence base, the review was extended to include adults and children. |
| **Key Findings:** Recent research has identified that most pre-driver and young driver educational interventions do not have the desired impact and that this could be because of an absence of appropriate behaviour change techniques (BCTs). A review set out to investigate which BCTs were most commonly associated with effective interventions in other areas of public health. The review found strong evidence regarding the efficacy of BCTs related to goal-setting; self-monitoring of behaviour; proving information on consequences; social support; providing instruction' and providing feedback on performance. It was recommended that these BCTs were incorporated into young driver interventions to improve the changes of successfully achieving behaviour change. |

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| **Title: Media Report: Young People in the Driving Seat** |
| **Published:** The co-operative Insurance (2016, March).<br><br>**Link:**<br><br>http://www.co-opinsurance.co.uk/assets/pdfs/insurance/mediacentre/media-report-young-people-driving.pdf |
| **Objectives:** Research aimed at exploring young drivers' opinions and experiences associated with the driving test, legal driving age and driver-assistance systems. |
| **Methodology:** Research was conducted by ICM Research in March 2016 on a nationally representative sample which included 1,000 drivers aged 17-25 years old. |
| **Key Findings:** 50% of drivers aged 17-25 took only one driving test before passing the test, 38% had to take two to three tests, 12% had to take four or more tests. More than one third (36%) of young drivers had 41 or more lessons before taking their test. 45% had between 21 and 40 lessons and every fifth driver received 20 lessons or less. Motorway driving was the potential change in the driving test that was most frequently indicated by young drivers as a necessary change in the driving test. Such opinion was shared by over three quarters (76%) of young drivers.<br><br>98% of young drivers class themselves as safe drivers, 42% perceive themselves as very safe drivers. Nevertheless 40% admitted to exhibiting dangerous behaviours. |

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| **Title: Evaluation of the Safety Benefits of the Risk Awareness and Perception Training Program for Novice Teen Drivers** |
| **Published:** Thomas, F., D., Rilea, S., L., Blomberg, R., D., Peck, R., C., Korbelak, K., T. (2016, January). *U.S. Department for Transportation National Highway Traffic Safety Administration*, *Report No. DOT HS 812 235*..<br><br>**Link:**<br>http://www.anstse.info/Resources%20PDF's/NEW%20Resources/NHTSA%20Risk%20Awareness%20PerceptionTraining%20NoviceTeen%20Drivers.pdf |
| **Objectives:** Study aimed at examining the impact of a Risk Awareness and Perception Training program on young drivers' crashes and collisions. |
| **Methodology:** Recruited were drivers aged 16 to 18 years old who had just passed their driving test for provisional or unrestricted licenses (first licenses). In total, 5,251 drivers participated in the project and they were divided into the intervention and control group. Drivers from the first group received Risk Awareness and Perception Training. Their crash and violations records were tracked for 12 months. |
| **Key Findings:** Analyses revealed significant treatment by sex interaction effect. It was established that male drivers who participated in the training had approximately 23.7% lower crash rates in comparison to the male control group. There were no significant differences between the groups of female drivers. Hypothesis on impact of the training on the time to first crash was not confirmed either. |

| **Title: Telematics research: impact on young and novice driver behaviour** |
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| **Published:** Tong, S., Lloyd, L., Durell, L., McRae-McKee, K., Husband, P., Delmonte, E., Parry, I., Buttress, S. (2015, December). *Transport Research Laboratory.*<br><br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/479202/provision-telematics-research-report.pdf |
| **Objectives:** The objective of this study was to review existing evidence of the telematics-based insurance policies on accident rates reduction in United Kingdom and other countries; identify experiences of other countries; potential data sources in United Kingdom; and scope and develop methodology for future studies. |
| **Methodology:** English language articles published from January 1995 to January 2015 were reviewed. In total, 41 search terms, in various combinations were applied. Databases used for the study were: Science Direct, PubMed, Google Scholar and Google. |
| **Key Findings:** It was established that, based on available data sources, the impact of telematics-based insurance policies on rates of accidents involving young novice drivers cannot be robustly evaluated. |

| **Title: A Review of Hazard Anticipation Training Programs for Young Drivers** |
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| **Published:** McDonald, C., C., Goodwin, A., H., Pradhan, A., K., Williams, A., F. (2015, July). *Journal of Adolescent Health*, *57*, S15-S23.<br><br>https://www.researchgate.net/publication/279302526_A_Review_of_Hazard_Anticipation_Training_Programs_for_Young_Drivers |
| **Objectives:** The aim of this review was to assess the empirical literature on hazard anticipation trainings addressed at young drivers. |
| **Methodology:** Analysed were articles published between January 1, 1980 and December 31, 2013 in an English language peer-reviewed journal or conference proceeding, that were reporting evaluation outcomes of hazard anticipation training and which included at least one group that uniquely comprised a cohort of participants aged under 21. In total, 19 publications were included. |
| **Key Findings:** Several studies proved that training effects can be seen in both – near and far transfer scenarios. Nevertheless, there was no evidence whether skills acquired in laboratories will be transferred to real road situations. It was concluded that evaluations at multiple time points, including long-term follow-up measures, would provide a clearer picture of how hazard anticipation training contributes to crash reduction during the early period of high-risk driving. It would address the question of the relationship of hazard anticipation training to young driver crash risk and enable an assessment of whether training effects can persist over time. |

**Title: Novice drivers' individual trajectories of driver behavior over the first three years of driving**

**Published:** Roman, G., D., Poulter, D., Barker, E., McKenna, F., P., Rowe, R. (2015, June). Accident Analysis and Prevention, *82*, 61-69.

**Link:** http://ac.els-cdn.com/S0001457515001955/1-s2.0-S0001457515001955-main.pdf?_tid=103ff68c-9e00-11e7-8126-00000aab0f01&acdnat=1505911057_43c840b08c93c9b017b21ff86c42801c

**Objectives:** The objective of the study was to determine the average trajectory of aberrant driver behaviours over time, to identify developmental trajectories, and explore whether identified groups can be differentiated by demographic characteristics known to be correlated to crash involvement.

**Methodology:** Analysis were performed on dataset from the Cohort II study of a six-year longitudinal study of UK novice drivers. The initial sample amounted to over 42,851 learner drivers, enrolled to the study between November 2001 and August 2005. 10,064 drivers completed the survey at 6 months after licensure, 7450 at 12 months, 4189 at 24 months and 2765 at 36 months. Information about driving behaviour was self-reported through 27 items from the Driver Behaviour Questionnaire, related to frequency of particular violations, unintentional cognitive failures, errors and lapses exhibited since completion of a preceding survey. Individual trajectories of driver behaviour were investigated with latent growth curve models. In order to identify groups of drivers with specific trajectories of aberrant behaviour, unconditional and conditional latent class growth analyses were applied.

**Key Findings:** All researched types of aberrant driving, i.e. aggressive violations, ordinary violations, errors and slips were significantly more frequently occurring across development. There were no subsets of drivers identified whose undesired behaviour decreased over time. Male gender and younger age proved to be predictors for membership of trajectories with higher levels of aberrant behaviour.

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| **Title: Changes in level of household car ownership: the role of life events and spatial context** |
| **Published:** Clark, B., Chatterjee, K., Melia, S. (2015, March). *Transportation, 43*, 565-599.<br><br>**Link:** https://link.springer.com/content/pdf/10.1007%2Fs11116-015-9589-y.pdf |
| **Objectives:** The aim of the study was to identify predictors of the number of cars in the household and of car ownership level changes. |
| **Methodology:** Analyses were performed on datasets from "Understanding Society – the United Kingdom Household Longitudinal Survey" (UKHLS), that were conducted on 2009–10 (wave 1) and 2010–11 (wave 2). It is a household panel study that follows the same households over time. Data collection for each wave of the survey took place over two calendar years. It is run on a nationally representative sample of around 40,000 households and a set of individual, household, and local-area characteristics. The data set eventually applied to the study amounted in total to 19,334 households after filtering records with missing values. Estimations on car ownership/non-ownership were performed on data from the wave 1 of the study (2009-2010) and the estimations on transitions related to car-ownership were based on data from the wave 2 (2010-2011). |
| **Key Findings:** It was established that the age of 16 to 24 years old is one of the strongest predictors in the case of change from one to zero car in the household. In case of households, in which the eldest person was in this age range, chances of a lack of car were 216.5% higher than for a household where the eldest householder is aged 45 to 59 years old. Chances of having 1 car are 51.8% lower in the households with the eldest person aged 16 to 24 years old in comparison to households with the eldest person aged 45 to 59 years old. At the same time, younger households were highly vulnerable to a shift to car non-holders - chances for such an event were 206.1% higher in their case than in the case of the households where the oldest person was aged 45 to 59 years old. Households, where the oldest person is aged 16 to 24 years old are also 45.9% less likely to possess a second car in comparison to households in which the oldest person is aged 45 to 59 years old. |

| **Title: Young Drivers Research Debrief** |
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| **Published:** Big Island Research and Planning (2015, March). https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411059/DfT_Young_Drivers_Debrief_.pdf |
| **Objectives:** The objective of the study was to develop insights on UK young drivers' learning process (in a broader sense) and stages of their involvement in car driving, with the use of various perspectives. |
| **Methodology:** Within the study there were 10 Focus Group Interviews with young drivers, 4 In-depth Interviews with parents and 8 In-depth Interviews with employers' representatives. In the case of the first two groups, applied screening criteria included: learning processes' stage, drivers' age, type of location, gender, social segment, and location. Respondents from the last group were representatives of companies having their own fleet. Their provenance was diversified in terms of: industry, company size and type of fleet. |
| **Key Findings:** It was concluded that driving is perceived by young people as a step to independence, giving them a feeling of freedom. Becoming a good driver was linked merely with certain attitudes than particular skills. Gaining confidence was perceived as a key step in this process, especially among young men. Preceding ones included mastering control over the vehicle and developing awareness about the road and traffic around. Passing the driving test is, in their view, not the final stage of the learning process, after licensure you learn a more "natural" way of driving and the "real" rules of the road.<br><br>Young drivers do not perceive themselves as being potentially affected by risk on the road, it seems for them to be more applicable to older people. In their view, young drivers accidents' statistics do not correspond to them. Collisions are attributed to the "reckless few", i.e. associated merely with certain attitudes than with inexperience. However, speeding is seen as the main cause of risk, multi-tasking is perceived as a permissible behaviour, not resulting in serious consequences.<br><br>When it comes to the driving test, it is not perceived as a final step in the learning process. It continues months after, when you learn more natural ways of driving and you learn the rules of the road. Nevertheless, the idea of the Graduated Driving License was resisted and not only by the young drivers, but by other groups as well. In fact, parents as the keeper of the car keys were to some extent substituting this restriction by imposing their own rules on how the car will be used in the first months after their children's licensure. Telematic policies are seen rather as an enforcement than educational measure. Although some young drivers and parents do not reject the idea of telematics, it is perceived as trading one's own freedom with insurance companies.<br><br>In contrast to Graduated Driving Licenses, mandatory driving lessons were seen as useful, worth investment and making a real difference on the road. The main factor influencing choice of instructor was his/her personality. All instructors can teach control and awareness, but what differentiates them is the ability to build confidence.<br><br>In the view of employers, young people would have the skills required and if not, additional training could be provided. Employers were merely concerned about possible attitudes and irresponsible driving. |

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| **Title**: **(Re)civilizing the Young Driver: Technization and Emotive Automobility** |
| **Published:** Lumsden, K. (2015). *Mobilities*, *10,*36-54.<br><br>**Link:** http://tandfonline.com/doi/full/10.1080/17450101.2013.823716 |
| **Objectives:** The study aimed to provide an understanding of young drivers' car culture and the rituals of modifying car and illegal racing. |
| **Methodology:** Ethnographic research consisting of semi-structured interviews with young drivers who were recruited in the city of Aberdeen from those who were regularly meeting with Grampian Police and observations of this group at car shows, events, in local garages, accessory stores and scrap yards. Researchers spent in total 150 hours with this group. There were also interviews with police officers, a local councillor, Member of Parliament, Member of the Scottish Parliament, three journalists, two council officials, two residents and a group interview with four residents present. Media reports which focused on the culture were subjected to content analysis. Over 200 articles were collected and analysed between August 2003 and September 2008 from daily local newspapers: the *Press & Journal* and the *Evening Express*; and two free newspapers distributed weekly across Aberdeen: *The Independent* and *The Citizen*. Relevant articles from national media outlets such as *BBC News* online, *The Times*, *The Guardian* and *The Scotsman* were also analysed. |
| **Key Findings:** Car modifying, including the usage of symbols, aesthetics, technical and/or mechanical modifications appropriating rituals and altering standard car settings served to create and sustain individual and collective identity of young drivers. Challenging and inverting norms of mainstream car culture was also a way of expressing lack of self-regulation of young people. Over time, car alterations were resulting in their need to keep up with new developments and in applications of various "patches" and "techno-fixes", since the authorities' reaction had been new policies and limitations on car alterations. |

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| **Title: Young Adults' Licence Holding and Driving Behaviour in the UK** |
| **Published:** Berrington, A., Mikolai, J. (2014, December). *RAC Foundation*.<br><br>**Link:**<br>http://www.racfoundation.org/assets/rac_foundation/content/downloadables/Young-Adults-Licence-Holding-Berrington-Mikolai-DEC-2014.pdf |
| **Objectives:** The aim of this report was to investigate relations between the demographic and socioeconomic circumstances of young adults and car-driving behaviour in the United Kingdom. The article also provides data on license holding among teenagers. |
| **Methodology:** Analyses were based on data from "Understanding Society – the United Kingdom Household Longitudinal Survey" (UKHLS), that were conducted in 2009–2010 (wave 1) and 2010–2011 (wave 2). It is a household panel study that follows the same households over time. Data collection for each wave of the survey took place over two calendar years on a nationally representative sample of around 40,000 households. |
| **Key Findings:** In 2009-2010, the share of full driving license holders among males aged from 17 to 19 living in urban areas other than the London area amounted to 39% and in the case of females with the same socio-demographical characteristics - to 29%. Among London's inhabitants from the same age group, there is a difference of about 10 percentage points in the share of full driving license holders in the group of men and in the group of women aged 17 to 19 years old. There was no apparent difference in the number of full driving license holders among male and female rural inhabitants aged 17 to 19 years old, almost every second person from these groups had a full driving license. Share of employed young adults aged 17 to 19 years old in 2009-2010, who were commuting to work by driving a car themselves amounted to 29%, and in the group of 20 to 24 years old it was 46%. |

**Title: Cell Phones and Young Drivers: A Systematic Review Regarding the Association Between Psychological Factors and Prevention**

**Published:** Cazzulino, F., Burke, R., V., Muller, V., Arbogast, H., Upperman, J., S., (2014, November). *Traffic Injury Prevention, 15,* 234-242.

**Link:**
http://www.tandfonline.com/doi/full/10.1080/15389588.2013.822075?needAccess=true

**Objectives:** The objective of this review was to identify factors contributing to mobile phone use and suggest a basis for prevention campaigns and strategies.

**Methodology:** PubMed, the Cochrane Library, and Web of Science were the screened databases. The following search terms were applied: “distracted driving AND teenager”, “distracted driving AND youth”, “cell phone AND driving AND teenager”, texting AND driving AND teenager”, “distracted driving AND cell phone AND driving”.

**Key Findings:** Multiple circumstances were identified which influence engaging in cell phone use. Factors that may result in a failure of abstaining from mobile phone use are: importance of an incoming or ongoing call, social acceptance, possession attachment and a positive attitude toward calling while driving and texting while driving.

Anticipated pressure linked with the importance of an incoming call or need to make an outgoing call can outweigh the perceived risk. Lower perceived risk of mobile phone use is also associated with greater perceived controllability or illusion of control. Nevertheless, it is suggested that mobile phone use while driving may not always meet with social approval. Apart from influencing social norms, regular and strict law enforcement is also viewed as a promising factor to lead to a decrease in mobile phone use.

Although young drivers are aware of the risks associated with mobile phone use, this awareness may be lower in comparison to older drivers. Secondly, a sense of prowess results in decoupling this risk from oneself.

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| **Title: Effects of situation awareness under different road environments on young and elder drivers** |
| **Published:** Yung-Ching, L., Jhong-Yi, C. (2014, August). Journal of Industrial and Production Engineering, *31,* 253-260.<br><br>**Link:**<br>http://www.tandfonline.com/doi/full/10.1080/21681015.2014.946103?needAccess=true |
| **Objectives:** Study aimed to examine the influence of age and road events on driving performance. |
| **Methodology:** 46 participants were invited to the study. Half of them were students aged 18-25 (mean age in this group was 20.79 and standard deviation of age was 1.22) and half of them were people aged over 65 (mean age in this group was 68.56 and standard deviation of age was 4.07). All participants were driving license holders and were subject to medical examinations prior to the experiment, in respect of vision, physical and mental conditions and colour perceptions. It was also required that participants had no previous experience in using a driving simulator. The study was a 2 x 6 mixed factorial experiment. |
| **Key Findings:** Younger people performed better in terms of lateral positioning and demonstrated other braking habits than older drivers. |

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| **Title: Young Driver Safety - a public attitude survey** |
| **Published:** Marshall, B., Parish, A. (2014, June). *RAC Foundation*.<br><br>**Link:**<br>http://www.racfoundation.org/assets/rac_foundation/content/downloadables/ipsos_mori_young_driver_safety_survey_final_june_2014.pdf |
| **Objectives:** The aim of the study was to learn attitudes to young driver safety, and in particular the introduction of a graduated driver licensing (GDL) scheme. |
| **Methodology:** Study was based on a survey conducted on a representative sample of 2,010 British adults aged over 16, with fieldwork undertaken between 7 March and 10 March 2014. The survey was conducted online and involved respondents drawn from the Ipsos Access Panel. Data was weighted to be representative in terms of region, age, gender, working status, tenure, socioeconomic grade and car/van availability in household. |
| **Key Findings:** Young drivers' road safety was perceived as a problem by the British public and they were generally supporting the idea of Graduated Driver Licensing. 83% thought that young drivers being involved in road accidents was a very big or fairly big problem. 45% strongly agreed that action needs to be taken to help ensure that young drivers (aged 24 or under) are less likely to be involved in road accidents, with a further 39% tending to agree. There was backing for the notion that politicians should give more attention to the issue of road safety: 71% of respondents were in agreement with this proposition and 30% strongly so. Support for GDL ran to over two thirds (68%) of the population and was relatively high even among those who did not perceive road safety to be a problem. A relatively low share of those aged under 24 were convinced of such a scheme - 41% supported it and almost a third of them (32%) opposed GDL. The introduction of the night-time curfews (prohibiting driving between midnight and 5 a.m. without the company of passengers aged 25 or over) was supported by 61% of Britons and restricting the number of passengers aged 15- to 19- years old to only one person (unless there is at least one passenger aged 25 or more) was backed by 66%. |

**Title: Graduated Driver Licensing – a regional analysis of potential casualty savings in Great Britain**

**Published:** Kinnear, N., Lloyd, L., Scoons, J., Helman, S., (2014, May). *RAC Foundation*.

**Link:**
http://www.racfoundation.org/assets/rac_foundation/content/downloadables/graduated_driver_licensing_regional_analysis_trl_270514.pdf

**Objectives:** The objective of the study was to examine the influence of introducing particular Graduated Driver Licensing (GDL) restrictions on casualty rates at a regional level across Great Britain.

**Methodology:** Research was conducted with the use of the STATS19 database, which is collected by police officers who attend sites of accidents or receive reports from people involved. Analysis was based on observations collected from 2008 to 2012, including drivers aged 17–19 who had an accident at night and those who had passengers. Data from the "On the Spot" (OTS) study was used for weighting purposes. OTS was a study on road accidents which was conducted in the Northamptonshire and Thames Valley areas by Transport Research Laboratory and Loughborough University and it also included data on passengers involved, regardless of occurrence of injuries.

Since analysis was constrained to drivers aged 17-19 years it has to be taken into account that the number of collisions may be underestimated. There was no accounting for alcohol consumption either and no information on the journey purpose.

**Key Findings:** It was suggested that the implementation of the Graduated Driving Licensing system with multiple components would result in saving at least 4,478 casualties (443 of these were classified as killed or seriously injured). Whereas for the more populated and more urban areas, introduction of the scheme would result in saving greatest absolute numbers of casualties, in terms of relative effects more rural regions would benefit most. It was also proven that extended time restrictions in the night-time component of GDL (no permission to drive without the company of adults over 25 between 9 p.m. and 6 a.m.) would be substantially more effective in reducing collisions and casualties than the limited version (no permission to drive without the company of adults over 25 between midnight and 5 a.m.). Similarly, implementation of a strong passenger component of GDL (no permission to drive with 15-24 years old passengers unless accompanied by a passenger aged over 25) appears to be more beneficial than the weaker component (no permission to drive with more than one 15-19 years old passenger unless accompanied by a passenger aged over 25).

**Title: THINK! Road Safety Survey 2013**

**Published:** TNS BMRB (2013, August).

**Link:**
http://webarchive.nationalarchives.gov.uk/20140322101948/https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/251297/think-annual-survey-2013.pdf

**Objectives:** Research investigated attitudes towards road safety and its importance in comparison to other social issues, attitudes towards driving, influences on driving behaviour and dangerous driving behaviour.

**Methodology:** Sample size amounted to 1,853 respondents. People aged over 16 living in England and Wales were invited to the interview. The interviewees were recruited by means of random location methodology. Sample points were defined with use of 2001 Census small area statistics and the Postal Address File. The interviews were conducted in-home and face-to-face. Interviewers were instructed to leave 3 doors between each successful interview. Quotas were designed to reflect distribution of characteristics such as: sex, social and working status, presence of children.

**Key Findings:** Young drivers' safety was seen as one of the top three important issues by 8% of all respondents. Motorists aged from 16 to 29 years old appreciated most road hazards to the same extent as all motorists. However, young drivers were less likely to be aware of the dangers of using mobile phone to text whilst driving (considered as dangerous by 76% of young motorists and 88% of all motorists); using mobile phone without a hands-free kit whilst driving (considered as dangerous by 73% of young drivers and 83% of all drivers); and driving with excessive speed for the conditions (considered as dangerous by 72% of young drivers and 81% of all drivers). Young motorists were also more willing to accept such behaviours as: using a mobile phone to text while driving (87% of young drivers and 94% of all drivers did not accept it); driving without hands free kit (not accepted by 79% of young motorists and 89% of all motorists); driving too fast for conditions (69% of young motorists and 80% of all motorists did not accept it); driving when unsure if over the alcohol limit (not accepted by 62% of young motorists and 74% of all motorists); driving after two pints (42% of young motorists and 55% of all motorists did not accept it); driving when too tired (not accepted by 37% of young drivers and 52% of all drivers); and driving at 40mph in a 30mph area (38% of young motorists and 50% of all motorists did not accept it). Young drivers were also more likely to see a wider range of dangerous behaviours in their social circle. Exceeding the speed limit by 10mph in a 30mph zone was the most frequently indicated behaviour (observed by 63% of young motorists and 50% of all motorists).

**Title: Changes in self-reported driving intentions and attitudes while learning to drive in Great Britain**

**Published:** Helman, S., Kinnear, N., A., D., McKenna, F., P., Allsop, R., E., Horswill, M., S. (2013, June). *Accident Analysis and Prevention*, *59*, 425-431.

**Link:** http://www.sciencedirect.com/science/article/pii/S0001457513002662

**Objectives:** The aim of the study was to examine shifts in attitudes and intentions to undertake certain behaviours across the learning stage among learner drivers in Great Britain.

**Methodology:** Data were obtained with use of standardized interviews with learner drivers conducted near the beginning of learning to drive and after passing the practical test. Data were collected between October 2010 and July 2012 from online self-reported questionnaires. Learners were invited by driving instructors from the East Midlands. None of the instructors recruited more than 8 participants. Sampling procedure was designed to match as closely as possible to the distribution of age and sex mix of practical test participants, based on the data collected by the UK Driving Standards Agency for the year ending 31/03/2010. Questionnaires included items on self-rated likelihood of being involved in an accident compared with the average driver; an item on self-rated driving skill compared with the average driver; the Driver Behaviour Questionnaire (DBQ) violation subscale containing a mixture of aggressive violations (two items) and highway code violations (six items); picture-based items related to speed choice in various areas and photo-animation measures of gap acceptance, close following, overtaking and thrill seeking items from the Driver Stress Inventory (DSI). Questionnaires at both stages were filled by 204 respondents. Respondents experienced on average 6.5 hours of driving instruction and 2 hours of private practice, which may be some limitation of the study. The average time gap between the two surveys amounted to 32 weeks. Data from a further 182 respondents who did not participate in the second survey were used in an initial scale analysis.

**Key Findings:** Learners before starting driving training displayed more cautious perceptions regarding their skill level and were less willing to undertake thrill-seeking behaviours than after passing the driving test. Opposite patterns were observed in the case of overtaking and close-following. Albeit some differences between males and females were observed for some measures, there was no evidence that changes over time were different for both sex groups.

**Title: Reported Road Casualties Great Britain: 2015 Annual Report**

**Published:** Department for Transport (2016, September).
**Link:** https://www.gov.uk/government/statistics/reported-road-casualties-great-britain-annual-report-2015

**Objectives:** The objective of the study was to present detailed statistics on circumstances of personal injury accidents, including the types of vehicles involved, the resulting casualties and contributory factors.

**Methodology:** Most of the statistics in the report are based on information about accidents reported to the police. However, other sources such as mortality, survey and hospital data are also used as well as population and traffic data to outline a wider context.

**Key Findings:**

In 2015 there were 1,730 reported road deaths, which was a decrease of 3% compared to the preceding year and 45% in 2015 than almost a decade earlier, i.e. in 2006.

**Title: Reported Road Casualties Great Britain: 2014 Annual Report**

**Published:** Department for Transport (2015, September).

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/463797/rrcgb-2014.pdf

**Objectives:** To present detailed statistics of personal injury accidents, including the types of vehicles involved, the resulting casualties and factors which may contribute to accidents.

**Methodology:** Most of the statistics in the report are based on information about accidents reported to the police. However, other sources such as mortality, survey and hospital data are also used as well as population and traffic data to provide a wider context.

**Key Findings:**

In 2014:

- 120 young drivers (aged 17 – 24 years) were killed and 742 were seriously injured.
- In total, 342 people were killed, and 3,872 seriously injured, in reported road accidents involving young car drivers.
- Of these 342 people, 120 were young drivers, 86 were their passengers and 136 were other road users.
- Both drink and drug driving are more prevalent amongst males and younger drivers.

| **Title: Reported Road Casualties Great Britain: 2013 Annual Report** |
| --- |
| **Published:** Department for Transport (2014, September).<br><br>**Link:**<br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/359311/rrcgb-2013.pdf |
| **Objectives:** To present detailed statistics of personal injury accidents, including the types of vehicles involved, the resulting casualties and factors which may contribute to accidents. |
| **Methodology:** Most of the statistics in the report are based on information about accidents reported to the police. However, other sources such as mortality, survey and hospital data are also used as well as population and traffic data to provide a wider context. |
| **Key Findings:**<br><br>• In 2013, 131 young drivers (aged 17 – 24 years) were killed and 1,159 were seriously injured.<br>• In total, 337 people were killed in crashes involving young car drivers that year.<br>• Of these 337 people, 131 were young drivers, 59 were their passengers and 147 were other road users.<br>• The number of people killed in young driver crashes has fallen by 56% from their average in 2005-09. |

| **Title: Reported Road Casualties Great Britain: 2011 Annual Report** |
| --- |
| **Published:** Department for Transport (2012, September).<br><br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/9280/rrcgb2011-complete.pdf |
| **Objectives:** To present detailed statistics of personal injury accidents, including the types of vehicles involved, the resulting casualties and factors which may contribute to accidents. |
| **Methodology:** Most of the statistics in the report are based on information about accidents reported to the police. However, other sources such as mortality, survey and hospital data are also used as well as population and traffic data to provide a wider context. |
| **Key Findings:**<br>• See page 9 of report. Although these do not include findings specific to young drivers. |

**Title: Reducing young driver crash casualties in Great Britain – use of routine police crash data to estimate the potential benefits of graduated driver licensing**

**Published:** Jones, S., J., Begg, D., J., Palmer, S., R. (2012, September). *International Journal of Injury Control and Safety Promotion*, *20,* 321-330.

**Link:** http://www.tandfonline.com/doi/abs/10.1080/17457300.2012.726631

**Objectives:** To estimate the potential casualty reduction and cost savings of introducing possible GDL systems in Great Britain.

**Methodology:** Police road crash data from 2000-9 were analysed to identify young driver crashes at night or while carrying passengers to estimate potential savings of having two types of GDL systems in place. The systems differed in terms of strictness with the most restrictive preventing driving (without a supervisor aged over 25 with a full driving licence) between 9pm and 6am and carrying passengers aged 15-24 years.

The less restrictive model prevented driving 10pm-5am and carrying more than two passengers aged 15-19 years old. The two models were applied over a three year period to the police crash data from ages 17-19 years. A 50% compliance rate was assumed.

**Key Findings:**

- Young driver crashes were twice as likely as older driver crashes to occur 9pm-6am and five times more likely than older drivers when carrying at least one passenger.
- Estimation of likely benefit with the strict GDL system with a range of compliance rates was 57-206 deaths per year and 436-1569 serious casualties per year.
- The cost saving was valued at £137M per year.
- See the paper for a range of casualty outcome reductions depending on the strictness of the possible GDL systems implemented and different compliance rates.

**Comments:** There are significant caveats associated with the findings here. Some of these are associated with limitations of the STATS19 data causing potential measurement error leading to over or under measurement of young driver crashes. It is difficult to predict compliance rates in GB due to the contextual differences between jurisdictions where GDL has been implemented and GB. While results of a range of compliance rates have been given, the findings of the study need to be treated with caution.

| **Title: Reported Road Casualties Great Britain: 2010 Annual Report** |
|---|
| **Published:** Department for Transport (2011, September).<br><br>http://webarchive.nationalarchives.gov.uk/20120926024403/http://www.dft.gov.uk/statistics/releases/road-accidents-and-safety-annual-report-2010/ |
| **Objectives:** To present detailed statistics of personal injury accidents, including the types of vehicles involved, the resulting casualties and factors which may contribute to accidents. |
| **Methodology:** Most of the statistics in the report are based on information about accidents reported to the police. However, other sources such as mortality, survey and hospital data are also used as well as population and traffic data to provide a wider context. |
| **Key Findings:**<br><br>• See page 1 of report. Although these do not include findings specific to young drivers. |

| **Title: Reported road accidents involving young car drivers: Great Britain 2009. Road Accident Statistics Factsheet No. 6 – 2009.** |
|---|
| **Published:** Department for Transport (2011, September).<br><br>http://webarchive.nationalarchives.gov.uk/20110911142754/http://www2.dft.gov.uk/pgr/statistics/datatablespublications/accidents/casualtiesgbar/suppletablesfactsheets/youngcardrivers.pdf |
| **Objectives:** The objective of the study was to present detailed statistics on circumstances of personal injury accidents, including the types of vehicles involved, the resulting casualties and contributory factors. |
| **Methodology:** Most of the statistics in the report are based on information about accidents reported to the police. However, other sources such as mortality, survey and hospital data are also used as well as population and traffic data to outline a wider context. |
| **Key Findings:** In 2009, 26% of all accidents, i.e. 42,000 involved at least one car driver aged from 17 to 24 years old. At the same time, they represented 12% of all licence holders. Accidents involving drivers aged from 17 to 24 years old resulted in 1.56 casualties on average, whereas this ratio ran at 1.36 casualties for all reported accidents. Most accidents involving the drivers aged 17 to 24 years old occurred on Friday and the fewest were reported on Sunday, which reflected the general pattern for all accidents. The greatest number of fatal or serious accidents happened on Saturday. Urban areas were the sites of the most accidents involving the drivers aged from 17 to 24 years (57%), these accidents accounted for 55% of casualties in young driver accidents. |

**Title: Graduated driver licensing for reducing motor vehicles crashes among young drivers (Review)**

**Published:** Russell, K., F., Vandermeer, B., Hartling, L. (2011, October). *Cochrane Database of Systematic Reviews*, *Issue 10. Art. No.: CD003300.*

**Link:**
https://www.researchgate.net/publication/51695826_Graduated_driver_licensing_for_reducing_motor_vehicle_crashes_among_young_drivers_Review

**Objectives:** To examine the effectiveness of GDL systems in reducing crash rates of young drivers.

**Methodology:** Studies were identified through searches of MEDLINE, EMBASE, CINAHL, Health star, Web of Science, NTIS Bibliographic Database, TRIS Online, SIGLE, the World Wide Web, relevant conference proceedings, consultation with experts and authors, and reference lists. The searches were conducted from the time of inception to May 2009 and the Cochrane Injuries Group conducted updated search of the TRANSPORT database in September 2009. The search was not restricted by language or publication status.

Studies were included if: 1) they compared outcomes pre- and postimplementation of a GDL program within the same jurisdiction, 2) comparisons were made between jurisdictions with and without GDL, or 3) both.

Studies had to report at least one objective, quantified outcome. Results were not pooled due to substantial heterogeneity. Percentage change was calculated for each year after the intervention, using one year prior to the intervention as baseline. Results were adjusted for the different crash types and presented for 16 year-olds alone as well as teenage drivers.

**Key Findings:**

- 34 studies were included evaluating 21 GDL programmes and 2 analyses of less than 40 US states.
- GDL systems were implemented in the US, Canada, New Zealand and Australia and varied in terms of restrictions included.
- Reductions in crash rates were seen in all jurisdictions and for all crash types.
- The authors conclude that GDL is effective in reducing crash rates among young drivers although the magnitude of the effect varies.
- Stricter restrictions in GDL systems appear to result in greater fatality reduction.

**Title: The Development of Children's and Young People's Attitudes to Driving: A Critical Review of the Literature**

**Published:** Durkin, K., Tolmie, A. (2010, September). Department for Transport, *Road Safety Web Publication No. 18.*

http://webarchive.nationalarchives.gov.uk/20121103221739/http://www.dft.gov.uk/publications/rsrr-theme2-report-18/

**Objectives:** The overall purpose of this report is to provide a critical review of the literature on the development of children and young people's attitudes to driving and being a car passenger. The aim is to synthesise existing evidence to help policymakers better understand how, when and to what extent they can target the development of road use skills in children as they move from being a pedestrian and cyclist to being a driver and passenger.

**Methodology:** This literature review focuses initially on psychosocial issues that have been identified as important factors in the behaviour of novice drivers. These form the basis for the main sections of the report. In each section, the main findings concerning novice drivers are summarised, with a particular emphasis on those that reflect developmental issues. The developmental implications are considered, drawing where possible on road user research that has been conducted with participants below driving age and also on related aspects of developmental psychological research.

**Key Findings:**

- Seven factors are identified:
  - Attitudes and affective beliefs
  - Perceived threat/perceived benefits
  - Subjective norms
  - Personality
  - Identity
  - Task difficulty and skills
  - Habit

**Title: How can we produce safer new drivers? A review of the effects of experience, training and limiting exposure on the collision risk of new drivers**

**Published:** Helman, S., Grayson, G., B., Parkes, A., M. (2010, February). *Transport Research Laboratory*, *INS005*.

**Link:** https://trl.co.uk/reports/INS005

**Objectives:** This insight report reviews evidence for the effectiveness of postlicence driving experience, driver education and training, and limiting the exposure of new drivers to risk through graduated driver licensing in lowering new-driver collisions.

**Methodology:** This is a literature review of the effects of experience training and limiting exposure on the collision risk of new drivers.

**Key Findings:**

- Driver education and training has little or no direct effect on the collision risk of new drivers.
- The exception to this is training that focuses on the cognitive skills involved in hazard perception skills as part of driver licensing.

**Title: Further analyses of accident data from the Cohort II study: When do drivers have their first accident and does it have an impact on their subsequent driving?**

**Published:** Sexton, B., Grayson, G. (2010, September). *Transport Research Laboratory*, *426*,

**Link:** https://trl.co.uk/reports/PPR426

**Objectives:** The analysis of the Cohort II study posed two questions: • When do new drivers have their first accidents and what are the factors that influence this? • What effect accidents have on the attitudes and self-reported behaviours of the drivers who are involved in them?

**Methodology:** The present study describes further analyses of the Cohort II study of learner and novice drivers.

**Key Findings:**

- The results indicated that drivers who are accident involved do modify some of their driving behaviours and attitudes.
- In particular, accident involved female drivers were aware that they were less decisive, less confident, made more errors and slips and were less aware in the period following an accident than they had been previously.
- Male drivers who were accident involved reported being less confident after the accident than they had been before it.

**Title: The accident history and behaviours of new drivers who pass their first practical driving test**

**Published:** Sexton, B., Grayson, G. (2010, September). *Transport Research Laboratory*, *427.*

**Link:** https://trl.co.uk/reports/PPR427

**Objectives:** The present report describes further analyses from the Cohort II study.

**Methodology:** The present report analyses the accidents, attitudes and selfreported behaviours of drivers who passed their practical test on the first occasion that they took it. It also examines their performance on the theory test and the practical driving test, and compares them with drivers who took more than one practical test.

**Key Findings:**

- Those taking the practical test for the first time were predominantly young (the majority being less than 19 years of age), and a high proportion were males.
- First-time takers took fewer theory test than did those who had failed a previous practical, and achieved higher scores on both the multiple choice and the hazard perception components. However, their pass rate was lower than that of those taking a second, third or fourth test.
- First-time passers as a group are even younger, with nearly 50% being 17 years of age, and again with a high proportion of males. The first time taking 17 year olds have the highest pass rate of 59%, as compared to 49% of all first-time takers.

**Title: Graduated driver licensing for reducing motor vehicles crashes among young drivers (Review)**

**Published:** Hartling, L., Wiebe, N., Russell, K., F., Petruk, J., Spinola, C., Klassen, T., P. (2004). *The Cochrane Collaboration, Issue 2*.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003300.pub2/epdf

**Objectives:** To examine the effectiveness of GDL systems in reducing crash rates of young drivers.

**Methodology:** Studies were identified through searches of MEDLINE, EMBASE, CINAHL, Health star, Web of Science, NTIS Bibliographic Database, TRIS Online, SIGLE, the World Wide Web, relevant conference proceedings, consultation with experts and authors, and reference lists. The search was not restricted by language or publication status. Studies were included if: 1) they compared outcomes pre- and postimplementation of a GDL program within the same jurisdiction, 2) comparisons were made between jurisdictions with and without GDL, or 3) both. Studies had to report at least one objective, quantified outcome. Two reviewers independently screened searches and assessed the full text of potentially relevant studies for inclusion using a standard form.

**Key Findings:**

- 13 studies evaluating 12 GDL programs that were implemented between 1979 and 1998 in the US (n=7), Canada (3), New Zealand (1), and Australia (1).
- Programs varied in their restrictions during the intermediate stage: e.g.:
  - night curfews (8);
  - limitations of extra passengers (2);
  - roadway restrictions (1).
- Based on the Insurance Institute for Highway Safety classification scheme, no programs were good, six were acceptable, five were marginal, and one was poor.
- Reductions in crash rates were seen in all jurisdictions and for all crash types.
- Among 16 year-old drivers, the median decrease in per population overall crash rates during the first year was 31% (range 26-41%).
- Per population injury crash rates were similar (median 28%, range 4-43%).
- Results for all teenage drivers, rates per licenced driver, and rates adjusting for internal controls were generally reduced when comparing within jurisdictions.
- The existing evidence shows that GDL is effective in reducing the crash rates of young drivers, although the magnitude of the effect is unclear.
- The conclusions are supported by consistent direction of the findings, and the temporal relationship and plausibility of the association.
- The reviewers have made recommendations for primary research on GDL (e.g. study methods, standardized reporting of outcomes and results, long term follow-up).
- The project has also shown what is needed to carry out systematic reviews of observational studies (e.g. quality assessment instruments).

**Title: Cohort II: A Study of Learner and New Drivers Volume 1 - Main Report**

**Published:** Wells, P., Tong, S., Sexton, B., Grayson, G., Jones, E. (2008, May). *Department for Transport, Road Safety Research Report No. 81*.

http://webarchive.nationalarchives.gov.uk/20120606181145/http://www.dft.gov.uk/publications/cohort-ii-a-study-of-learner-and-new-drivers/

**Objectives:** 'Cohort II' was a major six-year study, funded by the Department for Transport, providing 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. It builds upon and further develops the evidence base from the smaller Cohort I study in 1988 – 89.

The aims of the study were:

- to investigate how people learn to drive, including the number of hours of tuition and practice, and to compare this to outcomes from the theory and practical driving tests;
- to assess the impact of changes to the testing regime, specifically the hazard perception test which was introduced during the period of study;
- to explore new drivers' experiences and attitudes to driving; and
- to identify their level of accident involvement over time.

**Methodology:** Every three months, from November 2001 to August 2005, a random sample of 8,000 practical test candidates was drawn by the Driving Standards Agency (DSA) from candidates in a given week (approximately one-third of those taking their test that week). The resulting 16 cohorts were labelled A to P. Postal questionnaires were sent to these candidates and, if they passed their test, follow-up questionnaires were sent at specific points in their driving career. For all questionnaires, reminders were sent if a response was not received within two weeks. The sample initially comprised 42,851 learner drivers, however not all of these passed their practical tests to be involved in the subsequent surveys of new drivers. The sample of new drivers in Cohort II varied from over 10,000 at six months after the practical test to just fewer than 2,000 at three years after taking the test.

**Key Findings:**

- People who pass the test at a young age tend, initially, to drive less safely than others. This effect is strongest soon after the test, and declines during the first three years of driving.
- The pattern of results is consistent with the notion that residual effects of starting to drive young become diluted by other influences as time progresses.
- It shows that there is not something persistently different about those who start to drive very young – in terms of driving safety, they become like other drivers within a year or two.

- However, within this period they do have an excess accident liability, and this result re-emphasises the importance of finding ways of targeting safety interventions at very young drivers.
- The introduction of the hazard perception component in the theory test appears to have been associated with some reduction in subsequent accident liability, although the size of the estimated effect varies with the type of accident.

**Title: Learning to drive: The evidence**

**Published:** Emmerson, K. (2008, May). *Department for Transport, Road Safety Research Report No. 87*.

**Link:**
http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/rsrr87.pdf

**Objectives:** 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.

**Methodology:** This report reviews the literature and evidence around learning to drive.

**Key Findings:**

- 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.

**Title: Feeling Safe, Itching to Drive: Pre-Driver and Learner Perspectives on Driving and learning**

**Published:** Christmas, S. (2008, May). *Department for Transport, Road Safety Research Report No. 86*.

**Link:**
http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/feelingsafe/feelingsafemain.pdf

**Objectives:** To extend the insights of this previous research (Christmas, 2007) and, in particular, to investigate the possible origins of, and influences on, the patterns identified in previous research.

**Methodology:** The main phase of research consisted of nine qualitative workshops with groups of young people (85 in total), covering a range of different types of pre-driver and learner between the ages of 13 and 20. A further four workshops were with parents of some of the participants in these workshops (24 in total), along with three group interviews with ADIs (11 in total). Participants were recruited to ensure a mix of gender, social class and ethnicity, as well as diversity on other key dimensions (such as previous experience on a motorbike or moped). Workshops were held in five locations (Stockport, Yate, York environs, Leicester and Hounslow) in order to ensure a mix of rural and urban pre-drivers and learners.

**Key Findings:**

From this study, the author proposes a segmentation of young predrivers, learners and drivers, with the following five segments:

- rule observers, for whom good driving is about following rules and standards;
- risk minimisers, for whom good driving is risk-free driving;
- good neighbours, for whom good driving is sociable driving;
- God's gifts, for whom good driving is confident driving; and
- nightmare drivers, for whom good driving is entirely irrelevant.

**Title: Pre-driver Education: A critical review of the Literature on Attitude Change and Development, Good Practice in Pre-driver Education and Programme Effectiveness**

**Published:** Deighton, C., Luther, R. (2007, March). *Department for Transport, Road Safety Research Report*.

**Link:**
http://webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/predrivereducation.pdf

**Objectives:** The purpose of this report is to provide a self-contained copy of the critical review of the fundamental and applied literature on attitude development and change, good practice in pre-driver education provision and evaluation.

**Methodology:** Over a two-month period, the study team collected and reviewed 189 papers and contacted key researchers within national and international academic establishments. The initial development of a set of 23 research questions, linked to the study objectives, ensured that this process remained focused.

**Key Findings:**

- The literature review identified a complex set of factors that may influence the relationship between attitudes and behaviour.
- An identification of the key influences that pre-driver education can and should address is a key challenge to this project.
- While it is important that the industry understands the complexity of the attitude behaviour relationship, there is a need to ensure that this issue does not result in inaction.

**Title: Pre-driver Education: Survey of Pre-driver Education Provision**

**Published:** Launchbury, C., Deighton, C., Luther, R. (2007, March). *Department for Transport, Road Safety Research Report*.

**Link:**
http://webarchive.nationalarchives.gov.uk/20110504194220/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/predrivereducationsurvey.pdf

**Objectives:** The objective of the questionnaire survey was to develop an understanding of the current provision of pre-driver education in the UK and to investigate, to a lesser extent, any good practice applied by international providers.

**Methodology:** A questionnaire and follow-up telephone survey were used. The questionnaire survey achieved an acceptable response rate of 38% from a sample of 204 questionnaires issued. The sample comprised:

- all UK Road Safety Units (identified via the Local Authority Road Safety Officers' Association (LARSOA) website – www.larsoa.org.uk);
- seven UK non-government providers; and
- four international organisations.

A follow-up telephone survey investigated the provision of pre-driver education by the 111 road safety officers (RSOs) who did not participate in the questionnaire survey. The information collection was primarily via telephone and the requirement was to ask whether their road safety team provided pre-driver education. In addition, the interviewer invited contacts to provide a brief description of their pre-driver education interventions (e.g. target groups, education method and media, and intervention name, if applicable). Information was collected for 103 of the sample (n ¼ 111).

**Key Findings:**

- The combined findings of the questionnaire and telephone survey indicated that out of 173 UK road safety teams, 122 (71%) had a pre-driver education initiative in place and 51 (29%) did not.

**Title: The Good, the Bad and the Talented: Young drivers' Perspectives on Good Driving and Learning to Drive**

**Published:** Christmas, S. (2007, January). *Department for Transport, Road Safety Research Report No. 74.*

**Link:**
http://webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/pdfgoodbadtalenteddriver.pdf

**Objectives:** The impact of young people's attitudes and mindsets on their driving, and the possible implications for interventions to improve road safety were investigated.

**Methodology:** Six groups of young people (55 in total) took part in two twohour workshops, involving a range of exercises (e.g. character-profiling exercises, image exercises). Insights from the first series of workshops were used as the basis for the design of the second series, enabling us to ask questions of the young people that were based on what they had already told us about their experiences and perceptions of driving.

**Key Findings:** Participants defined being a good driver as the mastery of three different and parallel kinds of activity.

- Driving as a physical activity is about safely controlling and guiding a physical object through a complex physical environment.
- Driving as a social activity is about operating in a shared space in a way that ensures everyone is kept happy, and in a way that builds and maintains a desired image of oneself as a driver.
- Driving as an emotional activity is about preserving an appropriate frame of mind to drive well in the face of distractions and annoyances.

**Title: House of Commons Transport Committee Novice Drivers Seventh Report of Session 2006-07 Volume I**

**Published:** House of Commons (2007, July).

**Link:**
https://publications.parliament.uk/pa/cm200607/cmselect/cmtran/355/35502.htm

**Objectives:** The aim of the inquiry was to examine the potential for more radical measures which would be more effective in reducing casualties. The committee announced the terms of reference for the inquiry on 2 November 2006. [2]

**Methodology:** In the course of this inquiry the Transport Committee took evidence from road safety groups, the police, motoring organisations, the insurance industry, driving instructors and examiners, the unions, academics, local authorities, the Driving Standards Agency and the Minister for Transport, Dr Stephen Ladyman MP.

**Key Findings:**

- In this report a selection of measures to address the novice driver problem is presented.
- There is evidence which demonstrates the potential effectiveness of each measure.
- Introducing all of these measures would be an approach which would aim to reduce risk on all fronts.
- But if the Department were to pick and choose between the package of potential measures, such decisions must be clearly supported by evidence.
- The scale of deaths and injuries amongst novice drivers and the victims of their inexperience indicates that the current regulatory regime is failing. If the whole package of recommendations in this report were to be implemented, the UK would then have one of the most rigorous driver training, testing and post-test regimes in Europe.
- But for these measures to be fully effective, the Government must ensure that people are not able to bypass the system altogether and drive on our roads unlicensed and uninsured.
- It is believed that nationally something in the region of one million people are driving without a valid licence. [4]
- The Government's first priority must be to tackle the growing "underclass" of drivers who are on the roads illegally.
- Otherwise the impact of any attempt to improve road safety by addressing the licensing framework, driver education and driving behaviour will be lost.

| **Title: Young Drivers: The Road to Safety** |
| --- |
| **Published:** OECD Transport Research Centre (2006).<br><br>**Link:** https://www.itf-oecd.org/sites/default/files/docs/06youngdrivers.pdf |
| **Objectives:** This report puts forward policy-oriented, research-based recommendations for implementing countermeasures to address young driver risk. It also provides a general overview of the problem, and the factors behind it. |
| **Methodology:** This report is the result of two years of work by a group of expert researchers in the field of traffic safety from many organisations for Economic Co-operation and Development (OECD) and European Conference of Ministers of Transport (ECMT) countries. Working group members came from Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Korea, the Netherlands, Norway, Sweden, the United Kingdom and the United States. An earlier draft of this report was reviewed by international experts in the field of young driver risk. |
| **Key Findings:**<br><br>• Why do young drivers have such high crash rates?<br>• The response can be summarised under three general headings: experience, age and gender.<br>• The universal problem of young, novice drivers is inexperience.<br>• As most people learn to drive while they are young, inexperience explains much of the high levels of young driver risk.<br>• Furthermore, a minority of young drivers fails to manage a complex range of additional risk factors – many of which are related to age and gender – and is thus involved in a further disproportionate number of fatal crashes. |

**Title: In depth Study of Motorcycle Accidents**

**Published:** Clarke, D., D., Ward, P., Bartle, C., Truman, W. (2004, November). *Department for Transport, Road Safety Research Report No. 54*,

**Link:**
http://webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme5/indepthstudyofmotorcycleacc.pdf

**Objectives:** The aim of this study was to investigate the causes of motorcycle accidents. Very little research has been done in this country on the types of crashes experienced by motorcyclists. Motorcycle accidents have somewhat different characteristics when compared with other vehicle groups.

**Methodology:** A sample of 1,790 accident cases was considered, including 1,003 in detail, from Midland police forces, involving motorcyclists of all ages, and covering the years 1997–2002 inclusive. Each case was summarised on a database including the main objective features (such as time and place) and a summary narrative, a sketch plan and a list of explanatory factors. The summary narrative, in particular, included judgements by the researchers that emphasised the sequence of events leading up to the accident. In addition, a 25 item questionnaire was completed by a sample of relatively experienced motorcyclists recruited through the Motorcycle Action Group (MAG).

**Key Findings:**

- Significant differences were discovered in the sample with respect to the types of accidents involving motorcyclists (and their blameworthiness).
- The main findings were as follows:
    - There seems to be a particular problem surrounding other road users' perception of motorcycles, particularly at junctions. Such accidents often seem to involve older drivers with relatively high levels of driving experience who nonetheless seem to have problems detecting approaching motorcycles.
    - Motorcyclists themselves seem to have far more problems with other types of accident, such as those on bends, and overtaking or 'filtering' accidents.
    - There are two main groups of riders that interventions should be focussed on. The first is young and inexperienced riders of smaller capacity machines such as scooters, and the second is older, more experienced riders of higher capacity machines. Both the skills and attitudes of these riders need to be addressed.

**Title: Graduated driver licensing – a review of some current systems**

**Published:** Baughan, C., Simpson, H. (2001, January). *Transport Research Laboratory*, *529*,

**Link:** https://trl.co.uk/reports/TRL529

**Objectives:** TRL was asked by the Department for Transport, Local Government and the Regions to undertake a review of graduated licensing and related systems as part of a project to review the practical driving test.

**Methodology:** A literature review of the published evaluations of licensing systems in other countries and of some other relevant research.

**Key Findings:**

- The review has identified several elements of licensing systems that have been effective in other countries, address recognised aspects of the novice driver safety problem and could be considered for introduction in Britain.
- However, even where there is good evidence that an element has been effective in another country, prediction of the likely benefits in Britain is difficult.
- Despite this caveat, a serious case can be made for introducing some elements of graduated licensing, or graduated learning, systems in Britain.
- Results from Sweden indicate that increasing the amount of experience gained by learner drivers while they are being supervised by another driver is very effective at reducing their accident liability once they are allowed to drive solo.
- In other words, it appears that some of the learning responsible for the steep decline in accident liability currently seen in the first year or two of solo driving in Britain would take place in relative safety if the driver were being supervised.
- Novice drivers in Britain do have problems with alcohol, night driving, and passengers, and there is good reason to expect benefits from measures that address these problems directly.
- The emerging indications of where current driver training and education are deficient, and how they could be improved, offer the likelihood of our being able to develop training for pre and/or post solo driving that could be incorporated in licensing requirements with confidence that it would improve safety.

| **Title: Age and experience in motorcycling safety** |
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| **Published:** Rutter, D., R., Quine, L. (1996, January). *Accident Analysis and Prevention*, *28*, 15-21.<br><br>**Link:** https://www.sciencedirect.com/science/article/pii/0001457595000372 |
| **Objectives:** The aim of the study was to investigate factors leading to motorcyclists' accidents. |
| **Methodology:** National prospective survey of over 4000 riders in the United Kingdom. |
| **Key Findings:** Authors concluded that youth played a much greater role than inexperience, and accidents were attributable to a particular pattern of behaviour, i.e. willingness to break the law and violate the rules of safe riding. |

| **Title: Statistical analysis of motorcyclists' perceived accident risk** |
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| **Published:** Mannering, F., L., Grodsky, L., L. (1995, February). *Accident Analysis and Prevention*, *27*, 25-31.<br><br>**Link:** https://www.sciencedirect.com/science/article/pii/000145759400041J |
| **Objectives:** The objective of the study was to learn about motorcyclists' perceived collision risk. |
| **Methodology:** Survey of motorcyclists' perceived likelihood of being involved in an accident. |
| **Key Findings:** In the view of motorcyclists the main risk factors were: exposure, regularly exceeding the speed limit, and passing vehicles on the shoulder or passing between lanes of traffic. |

28 Calthorpe Road, Edgbaston, Birmingham, B15 1RP

**Telephone:** 0121 248 2000

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