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Driver2020 - an evaluation of interventions designed to improve safety in the first year of driving

Report D3: Delivery of interventions and engagement by novice and learner drivers

J Hitchings, A Holcombe, N Christie, J Weekley, S Helman

DRIVER 2020

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Executive summary

Background

It is a known challenge in road safety that young and novice drivers are at a greater risk of involvement in collisions than more experienced drivers, for reasons associated with their younger age, and their relative lack of on-road experience. A large evidence base confirms this (see Appendices A.1 and A.2).

Historically there have been two broad approaches to reducing collision risk for young and novice drivers. The first is to use the licensing system to directly target age and experience factors, using legislation to set a minimum age for licensure or minimum periods of time for people to spend in the supervised learning phase, and to set restrictions on higher risk driving situations after solo driving begins. There is a strong evidence base showing that this approach can be effective at reducing risk (see Appendix A.3) in other jurisdictions. One post-test measure in the Great Britain system is the two year probationary period during which new drivers on their first full licence who accumulate six or more penalty points have their licence revoked and are required to go through the learning process again. The second broad approach is to use non-legislative approaches such as driver training and education to try to equip drivers with better skills and knowledge to keep safe. There is less evidence that this approach is effective (see Appendix A.4).

The Department for Transport (DfT) commissioned TRL to conduct the Driver2020 project, which sought to build evidence for educational, training and technology-based non-legislative approaches by evaluating the most promising of these in a randomised controlled trial reflecting a potential real-world voluntary rollout of such measures.

The Driver2020 project

In a previous DfT review of evidence, including a consultation with stakeholders, Pressley et al. (2016) identified five interventions that showed promise, and were the most suitable for trialling in a research programme committed to in the 2015 Road Safety Statement. Two of these were designed to be delivered during the post-test period, when people have passed their practical driving test and have begun solo driving. These interventions were:

- **Mentoring agreements:** a set of materials for use by novice drivers and mentors (for example parents) in voluntarily setting restrictions on early post-test driving (for example driving with peer-age passengers, or driving at night
- **Telematics:** an app-based intervention designed to provide feedback to novice drivers on their driving style, with modest incentives (weekly treats such as coffee vouchers, and a monthly entry into a prize draw to win a month's free car insurance) provided for safer driving.

Three were designed to be applied during the learning stage ("learner driver interventions"):

- **Logbook:** an app designed to encourage more on-road practice, covering a broader range of driving conditions and road types, during the learning period (a modest

incentive was used for this group - participants having an opportunity to receive learner driver insurance at a discounted rate)

- **Hazard perception training:** a set of three eLearning modules designed to improve hazard perception skill
- **Classroom-based education:** a whole-day classroom-based intervention in which attendees take part in several activities designed to equip them with knowledge and skills, and ongoing self-monitoring strategies, to make them safer as drivers.

The DfT-funded Driver2020 project is the research programme that evaluated these interventions. This report presents findings from the qualitative research that was carried out with users and providers to understand engagement with the interventions. Three other project reports present findings on the effectiveness of the novice interventions, findings on the effectiveness of the learner interventions, and a summary of findings from the whole project (Weekley et al., 2024a; 2024b; Helman & Weekley, 2024).

The key focus of this engagement research was to complement the effectiveness evaluation, so that any interventions could be rolled out with the best chance of appealing to or being encountered by young and novice drivers. For all interventions, due to the fact that participants were free to choose to engage, the research question for this element of the evaluation was:

- What were the factors that led people to engage with the intervention, or the barriers that stopped them engaging?

Method

The research question was addressed through undertaking interviews with participants in each of the intervention groups who were known – through system data from each intervention provider – to have either engaged or not. 'Engagement' interviews were carried out with participants who were known to have engaged with the intervention to some degree and were focused on why and how they engaged and what their experience was. 'Non-engagement' interviews were carried out with participants who were known to have engaged very little or not at all and were focused on the reasons why not and what, if anything, would have encouraged them to do so. For the non-engagement interviews, it was important to interview participants who had chosen not to engage with the intervention they were offered, rather than those who did not notice or read the original email invitation to sign up to the intervention.

The sample consisted of 41 males and 93 females, all between the ages of 17 and 25 years old; these were split between those doing engagement interviews and those doing non-engagement interviews, and across the five interventions. The aim was to achieve at least 10 participants for each intervention for both engagement and non-engagement interviews; this was achieved for almost every group (one group – logbook non-engagement interviews – had eight participants). The gender split for each group was variable.

Separate topic guides were designed to ask participants about their experience of learning to drive and their engagement with the intervention content. As the Driver2020 project coincided with the COVID-19 pandemic, topic guides were updated to allow for additional

information to be collected on how the pandemic affected individuals' experiences of learning to drive.

Interviews were conducted either by telephone or via Microsoft Teams, with each lasting approximately 20-30 minutes. Participants were given a £10 retail voucher (or charity donation if they preferred) for taking part. Interview transcripts were thematically analysed through an iterative process to identify key themes.

This work also included discussions with the partners who delivered the five interventions. These discussions were focused on the elements of delivery that went well, what could be improved and their opinions on whether and how these interventions could be rolled out more widely. These discussions (which due to their nature were not suitable for any formal analysis) are not included in the summary of findings below but are discussed in the main body of this report.

Limitations

The qualitative analysis in this report should be interpreted as supplemental to the effectiveness evidence presented in Weekley et al. (2024a) and Weekley et al. (2024b). Due to the nature of the qualitative research, the findings are not generalisable, however the sample was aimed at reflecting both those who engaged with the interventions and those who did not. The purpose was to gain insight into the key themes and issues that affect engagement. Two specific limitations are noted: potential response bias in non-engagement interviews, possibly skewing reasons for non-engagement, and a gender imbalance in the qualitative sample, potentially introducing gender bias to the findings.

Findings

The main themes resulting from the participant interviews are discussed below. The themes were derived from the interpretation of the researchers, which was in turn based on the discussion with participants. These discussions gave participants an opportunity to reflect on the interventions offered to them, and how they used (or did not use) these. The researchers used this feedback to interpret the things that appeared to help or hinder engagement.

Learning to drive and driving were seen as challenging but important

Learners interviewed had a clear insight into the challenges involved in learning to drive; they also anticipated that the learning-to-drive process would not prepare them completely for driving after they passed and acknowledged the disconnect between pre-test and post-test driving. However, despite the cost and effort required, driving was seen by them as an important transferable life skill that provides flexibility and freedom of mobility.

Interventions offered during the learning stage that are perceived as being helpful to licence acquisition were attractive for engagement

In the learning stage, the key motivation for learners interviewed appeared to be passing their test and progressing through the licensing process as fast as possible, even though they reported (unprompted) that the learning-to-drive process did not equip them with

everything they would need for post-test driving. Participants consistently mentioned their desire for content that would help them with licence acquisition, and especially the theory test. A possible interpretation of this finding could be that some non-engagement was driven by a perception that engaging with content that may *not* help in this respect was pointless. Additional content that would be in some way useful after the test (for example, knowledge that would help with the financial side of car ownership) was also reported as being desirable by learners.

The shift to 'real driving' moved the focus to safety, but perceived helpfulness of interventions was still important for engagement

There was a notable shift in the tone of comments from novices interviewed, relative to learners interviewed, in terms of the more obvious focus on safety from the former group; the focus on 'passing the test' very quickly shifted to one of 'staying safe' once the realities of post-test, unsupervised driving hit home. Importantly however, novice participants still fed back the importance of understanding what the benefits of the interventions would be for their post-test driving (for example helping them to 'pace' their development), to improve the attractiveness of those interventions.

Opportunities for self-reflection were appreciated

Across most, if not all, interventions, participants noted how much they valued the opportunity to reflect on their own driving, including potential risks and how they might overcome them. This theme demonstrates that, for all their focus on passing their test and gaining new-found freedoms, learner and novice drivers interviewed were more than capable of responding positively to a deeper consideration of the risks and nuances associated with motorised mobility once they engaged. Self-reflection may be an important teaching technique to include in any interventions.

Getting 'the basics' right in terms of usability and communication was critical for engagement

It was apparent that if participants interviewed were either unaware of the potential benefits of an intervention, or not convinced of them, they were less likely to engage. This is especially important in terms of the communication of the benefits noted above: helping with licence acquisition (learner driver interventions), pacing of development (novice driver interventions) and self-reflection. For all interventions, participants reported a desire for more reminders to help them remember to engage. Lack of usability or technical issues were sometimes reported by participants as reasons for disengagement with the interventions, highlighting the importance of these issues.

1 Introduction

1.1 The challenge of young and novice drivers

This section summarises the known road safety challenge presented by young and novice drivers, and a short description of research with this group including the programme of applied work delivered in Great Britain throughout the 1990s and 2000s, that laid the foundations for the approach taken in the Driver2020 project. It is a summary of the more detailed background provided (with references) in Appendix A.

The conclusion that emerges from this evidence is that young and novice drivers have an elevated collision risk for reasons associated with their youthfulness and their inexperience. In short, younger drivers and less-experienced drivers are at greater risk. Successfully reducing risk requires interventions that act on one or both areas.

Approaches that bring about an increase in the age at which someone becomes licensed have reduced collisions. The same is true of approaches that provide drivers with greatly increased levels of on-road experience before licensure. Finally, approaches that that limit exposure to the riskiest situations in early driving after licensure – allowing experience to build up in lower risk situations before access to higher risk situations is granted – are highly effective in reducing collisions. Such approaches are typically associated with licensing systems different from the one in Great Britain; the only post-test measure in the Great Britain system is the two year probationary period during which new drivers on their first full licence who accumulate six or more penalty points have their licence revoked and are required to go through the learning process again. Note that driver licensing is devolved in Northern Ireland and so this project covers Great Britain only.

Many interventions based on education, technology and training have not been developed and delivered in an evidence-led way. Currently, there are no standards or guidance for road safety education, so interventions can vary hugely in quality, delivery and content . They have delivered poor results because they either target things that may not be relevant for safety, or they target things that are relevant, but do so inadequately. An example of the former is the traditional ‘skills’ approach to driver training. In the past this has failed to bring about safety improvements due to a focus on specific vehicle control skills such as ‘recovering from skids’, on the assumption that improving such skills will reduce collision risk. An example of potentially inadequate targeting can be found in attempts to provide drivers with knowledge about risk on the assumption that this knowledge will lower drivers’ collision risk by bringing about changes to their driving behaviour. The assumptions underlying these approaches have turned out to be incomplete. Vehicle control skills do not appear to be adequate to ensure safety, and changing behaviour requires more than just a provision of information about risk. Approaches that have fared better include hazard perception training, which focuses on the skill of anticipating potential hazards on the road ahead, although the literature on such approaches is still relatively immature in so far as being able to demonstrate a direct link from the training to collision outcomes.

Some training and education approaches have even been associated with increased crash risk. There are plausible mechanisms that can explain how this can happen. For example, it is believed that some skid training courses have led to some drivers taking additional risks,

as they assume that their new training will keep them safe; in reality the skills fade quickly without practice, and therefore this confidence is unfounded. Some education approaches have resulted in people gaining access to driving earlier (and therefore at a younger age) than would otherwise have been the case, putting them at more risk as a result.

In light of the relative lack of success of many existing interventions based on education, technology, and training, even in graduated licensing systems, research attention is now revisiting such approaches such that they can support other policy approaches. The hope is that if interventions can be based on sound behavioural science, and can be focused on the right mechanisms, they can add value.

1.2 Origins of the research

In the 2015 Road Safety Statement (DfT, 2015) the Government committed to "Undertaking a £2 million research programme to identify the best possible interventions for learner and novice drivers" (p8). The Statement also set the context for this research programme by stating the following in paragraphs 1.11 and 1.12:

> "1.11: Ten years ago, there were fewer options for reducing the elevated collision risk within the young driver population. Many foreign governments placed legislative 'graduated driver licencing' restrictions on their young people. These options include restricting driving to the hours of daylight or not allowing the carriage of passengers, for months or even years after passing tests."
>
> "1.12: Technology is one of the ways that we can help young drivers be safer. Technology is now emerging that can manage novice driver risk in a more bespoke way without restricting the freedoms of all of our young people. In short, there are modern and sophisticated non-legislative alternatives that treat each young driver as an individual with their own distinct risk profile."

The work that underpinned the commitment to the research programme that became the Driver2020 project was therefore focused on finding non-legislative interventions that were best suited for trialling.

1.3 New approaches to reducing collision risk

The year after the publication of the Road Safety Statement, the Department for Transport (DfT) commissioned a review of interventions for young and novice drivers, focusing specifically on identifying interventions based on education, training and technology that showed promise either theoretically (for example being based on accepted models of learning or behaviour change) or based on evaluation data on some relevant surrogate measure of risk (for example driving behaviour) (Pressley et al., 2016). The intention was that these interventions could then be evaluated in a controlled trial in Great Britain, looking specifically at their effectiveness in reducing collisions.

The brief for the Pressley et al. project specifically excluded approaches that legislative in nature and focused on non-legislative options.

In this way, the Pressley et al. review was the work that laid the ground for the Driver2020 project; the intention was that the candidate interventions identified would subsequently be tested in a large-scale controlled trial, using collisions as the main outcome measure.

Pressley et al. concluded that there were seven approaches that showed promise. Three of these involved parental engagement in the learning and early driving of young and novice drivers, three involved the use of telematics or app-based approaches to monitor and manage driving risk, and one was hazard perception training. All were found to show promise either based on existing evidence of changes in relevant surrogate measures or based on linking to a known risk factor for young and novice drivers in a theoretically coherent and plausible way.

1.4 The Driver2020 project

Following a stakeholder workshop on the feasibility of such interventions identified in Pressley et al. (2016), four were recommended for trialling.

Two of these were designed to be applied in early post-test driving ("novice driver interventions"):

- **Mentoring agreements:** a set of materials for use by novice drivers and mentors (for example parents) in voluntarily setting restrictions on early post-test driving (for example driving with peer-age passengers, or driving at night)
- **Telematics:** an app-based intervention designed to provide feedback to novice drivers on their driving style, with various incentives provided for safer driving.

Two were designed to be applied during the learning stage ("learner driver interventions"):

- **Logbook:** an app designed to encourage more on-road practice, covering a broader range of driving conditions and road types, during the learning period.
- **Hazard perception training:** a set of three eLearning modules designed to improve hazard perception skill.

Following the recommendations from Pressley et al., a decision was also taken by the Department for Transport to include an education-based intervention for trialling (to be applied during the learning period). The reasoning for this was that, despite there being limited evidence uncovered in the Pressley et al. review, delivery capacity for this type of intervention exists in Great Britain, and there was already widespread delivery. Driver2020 provided an opportunity to develop an education intervention informed by behaviour change techniques and targeted at learner drivers. It was therefore decided that if strong content, informed by behaviour change theory, could be designed, then evaluating this alongside the other approaches would be of value:

- **Classroom-based education:** a whole-day classroom-based intervention in which attendees take part in several activities designed to equip them with knowledge and skills, and ongoing self-monitoring strategies, to make them safer as drivers.

The Driver2020 project was therefore a national trial to evaluate the effectiveness of these five interventions. The project was procured in 2017 and was registered at the ISRCTN registry (https://www.isrctn.com/ISRCTN16646122).

1.5 Research questions

The main research question for each intervention was as follows:

- How effective is the intervention at reducing collisions in the first 12 months of post-test driving?

A secondary research question for each intervention was:

- Does engaging with the intervention lead to other changes in relevant surrogate measures?

For all interventions, due to the fact that participants were free to choose to engage, the following research question was also asked:

- What were the factors that led people to engage with the intervention, or the barriers that stopped them engaging?

1.6 This report

This report presents the findings from the qualitative research undertaken on the Driver2020 project, focused on delivery of and engagement with the interventions. Four reports cover the whole project:

- D1 – Effectiveness of interventions delivered to novice drivers (Weekley et al., 2024a). Presents analysis and findings from the quantitative evaluation of the novice driver interventions.
- D2 – Effectiveness of interventions delivered to learner drivers (Weekley et al., 2024b). Presents analysis and findings from the quantitative evaluation of the learner interventions.
- D3 (this report) – Delivery of interventions and engagement by novice and learner drivers (Hitchings et al., 2024). Presents analysis and findings from the qualitative evaluation using interviews with participants and delivery partners for both novice and learner interventions.
- D4 – Summary of findings (Helman & Weekley, 2024). Overall project report summarising the key findings from each part of the trial.

Please note that these four references are cross-referenced in the reports (including this one) when it is useful to do so; however, they have been published at the same time as each other as part of the Driver2020 project, rather than being part of the wider existing literature. A supplementary appendix containing the data collection surveys and intervention logic models is also available (Weekley & Helman, 2024).

This report is structured as follows:

Section 1 has described the background to the Driver2020 project – covering its origins within policy, the aim of the project and the research questions. Section 2 describes the overall method for the study in terms of its high-level design and approach. The impact of the COVID-19 pandemic on the trial is also discussed in this section. Note that much of Sections 1 and 2 are included in all project reports, with minor adjustments relating to the focus of the report. Section 3 provides a summary of each of the interventions.

Section 4 then discusses the methods used in the qualitative work, including the sample, recruitment and analysis. Sections 5, 6 and 7 present the findings from interviews, covering the general context of learning to drive, things that were perceived to have gone well with the interventions, and perceived barriers; the focus throughout is on pulling out insights across all interventions that will help with maximising engagement.

Section 8 summarises the discussions with the partners who delivered the interventions throughout the project, focused on their opinions of how to increase engagement in any potential rollout. Finally, Section 9 discusses the findings.

2 Method – overall study

2.1 Design

The trial had two arms. One arm tested the effectiveness of the novice driver interventions (mentoring agreements, telematics). The other tested the effectiveness of the learner driver interventions (logbook, hazard perception training, classroom-based education). See Section 3 for descriptions of these interventions. Figure 2-1 and Figure 2-2 show (again at a high level) the route participants took through the study. Participants were only able to sign up for one arm of the trial.

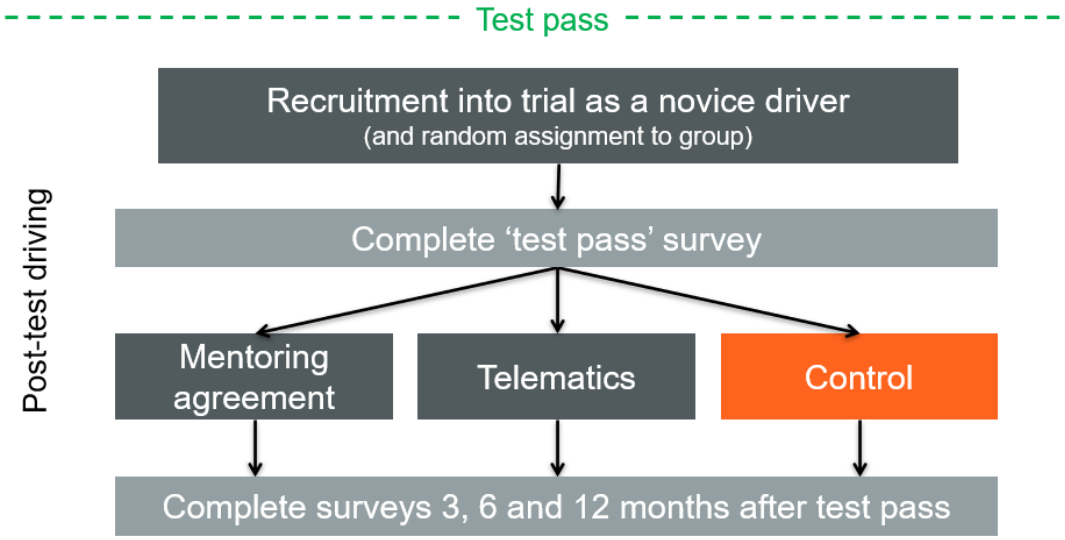

Figure 2-1: Design – novice driver arm

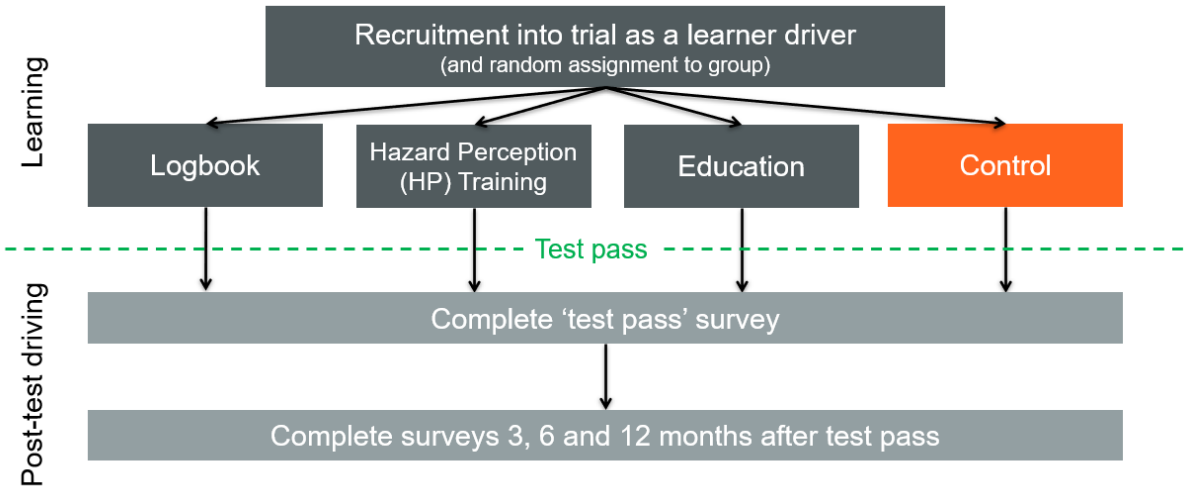

Figure 2-2: Design – learner driver arm

Because participants were assigned randomly to treatment or control groups in their respective arm of the study, the Driver2020 project is a type of randomised controlled trial

(RCT). Incentives were required to reflect those that might be expected to be sustainable in any wider roll-out of a given intervention, meaning in practice that they were very modest.

The study could thus be better described as using a 'randomised encouragement' design (West et al., 2008). Unlike in classic RCTs in which participants are expected to adhere fully to a treatment protocol (and are given incentives to ensure this), in this design participants were randomly assigned only to an opportunity or 'encouragement' to receive an intervention. Crucially, the participants choose whether or not to engage with the intervention – and if they did engage, to what extent. This approach is useful when the incentives required to guarantee engagement would be unrealistic, undermining a generalisation of the findings to real-world roll-out. It is also useful when testing a voluntary (rather than legislatively-enforced) behaviour, as it allows exploration of engagement.

Thus, in simple terms Figure 2-1 shows that:

- Novice drivers were recruited into the trial shortly after passing their practical driving test, and then randomly assigned to either the mentoring agreements, telematics, or control group. They decided whether and how much to engage with any intervention they were offered during the next 12 months.
- They were immediately asked to complete their test pass survey on being recruited (because they had already passed their practical driving test).
- They were then asked to complete further surveys 3, 6 and 12 months after the date they passed their practical driving test.

Figure 2-2 shows that:

- Learner drivers were recruited into the trial and were randomly assigned to either the logbook, hazard perception training, classroom education, or control group. They decided whether and how much to engage with any intervention they were offered during their learning period (which varied in length, depending on the participant).
- They were asked to complete their test pass survey shortly after passing their practical driving test (if they passed within the timescales of the study)
- They were then asked to complete further surveys 3, 6 and 12 months after passing their practical driving test.

2.2 Approach to research questions

2.2.1 Research questions related to impact of the interventions

The main research question for each intervention was as follows:

- How effective is the intervention at reducing collisions in the first 12 months of post-test driving?

This was assessed by comparing the average number of self-reported collisions (controlling for other factors such as mileage) in the first 12 months of post-test driving in each intervention group with that of the corresponding control group.

A secondary research question for each intervention was:

- Does engaging with the intervention lead to other changes in relevant surrogate measures?

This was assessed by comparing the relevant surrogate measures for each intervention group (these differed by group and were largely self-reported) with the same in the corresponding control group. Surrogate measures included things like driving style (something targeted by the telematics intervention), the setting of limits on driving in some post-test contexts (targeted by the mentoring agreements), the amount of pre-test practice (targeted by the logbook intervention) and hazard perception scores (targeted by the hazard perception training intervention). See Section 3 for descriptions of the interventions.

In Great Britain it is not feasible to identify individual drivers in official casualty data (STATS19). This was the main reason why self-reported survey measures were used to collect data. The reliance on self-reported measures in answering surveys is also a cost-effective approach with such large samples – in total around 27,000 people registered into the study, though not all completed data collection. This approach may be subject to some measurement error and bias (for example people may respond in a socially-desirable way) and these limitations need to be taken into account when interpreting the findings; however, while not perfect, this approach has offered many insights in previous studies of this kind (e.g. Wells et al. 2008; Forsyth et al. 1995; Maycock et al. 1991).

The evaluation of the impact of the interventions from the novice and learner arms of the study are presented in Weekley et al. (2024a) and Weekley et al. (2024b) respectively.

2.2.2 Research question relating to engagement with the interventions

For all interventions, due to the fact that participants were free to choose to engage, the following research question was also asked:

- What were the factors that led people to engage with the intervention, or the barriers that stopped them engaging?

This was assessed through undertaking interviews with participants in each of the intervention groups who were known – usually through system data from each intervention provider – to have engaged to varying degrees (including some who had not engaged at all).

The key focus of the engagement research (presented in this report) was to complement the effectiveness evaluation, so that any interventions found to be effective could be rolled out with the best chance of appealing to or being encountered by young and novice drivers.

2.3 Timeline of the study

Figure 2-3 shows the relative timings of the recruitment, delivery and data collection for the learner and novice arms, including in relation to the COVID-19 pandemic.

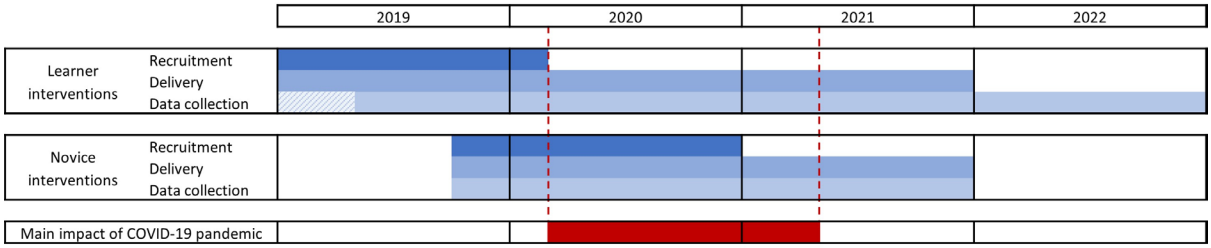

Figure 2-3: Timings for recruitment, delivery and data collection for the learner and novice interventions in relation to the COVID-19 pandemic

Recruitment for learners began in January 2019 and continued until early March 2020 (prior to the start of the COVID-19 pandemic). The delivery period for the learner interventions began at the same time and continued until December 2021, at which point delivery to those learner participants who had not yet passed their test was stopped. Data collection continued until December 2022 to allow 12 months post-test driving for those participants who passed their test close to this date.

Recruitment for novices began in October 2019 and continued until early January 2021. Delivery of the novice interventions began immediately and continued until December 2021 when the final novice participant completed 12 months post-test driving (and associated data collection).

Figure 2-3 also shows the timing of the main impact of the COVID-19 pandemic in relation to the recruitment and delivery of the interventions; this was from the beginning of the first lockdown in March 2020 until the end of the third lockdown in early May 2021. However, it should be noted that the impact of the pandemic, particularly on the waiting time for practical driving tests and therefore the pass rate of learner participants, is still ongoing at the time of writing.

Details of the impact of the pandemic on the novice arm of the study are covered in detail in Weekley et al. (2024a). The impact on the learner arm is discussed in greater detail in Weekley et al. (2024b). General impacts are discussed in the next section, to provide context for the discussion of this issue with participants.

2.4 The impacts of the COVID-19 pandemic on the Driver2020 project

2.4.1 Practical tests, theory tests and formal driving lessons (with Approved Driving Instructors (ADIs))

A key impact of the pandemic was that practical driving tests were suspended (for all except key workers) during the periods of lockdown. These dates varied by country (and by region) and are summarised below in Table 2-1.

Table 2-1: Dates of practical driving test suspension in England, Scotland, and Wales during the COVID-19 pandemic

Practical (car) driving test	England	Scotland	Wales
1st lockdown			
Suspended	20 March 2020	20 March 2020	20 March 2020
Started	22 July 2020	14 September 2020	17 August 2020
2nd lockdown			
Suspended	5 November 2020	Not suspended	24 October 2020
Started	2 December 2020	Not suspended	9 November 2020
3rd lockdown			
Suspended	5 January 2021	26 December 2020	20 December 2020
Started	22 April 2021	6 May 2021	22 April 2021

Before and after the 2nd lockdown, all three countries were subject to localised restrictions known as tiers (England), protection levels (Scotland) and alert levels (Wales). In addition to the nationwide lockdowns listed above, practical driving tests were also suspended when an area was in Tier 4 / Protection Level 4 / Alert Level 4, which happened at various times.

Theory tests were also suspended (for all except key workers); the dates for these were broadly similar to the dates for practical tests.

Formal driving lessons were also cancelled over the same period. The advice for most driving school instructors and independent instructors was that lessons should not go ahead except for key workers who were preparing for an essential driving test.

The impact of these suspensions was greatest on the learner participants. With the exception of those who had already passed their test by March 2020 (15%), all experienced an impact on their learning to drive process – by the cancellation of their tests (if booked), cancellation of lessons and the inability to book and take the test when ready. Depending on their recruitment date, the learning-to-drive process of novices may also have been affected; all those who were recruited after March 2020 may have experienced these impacts on their learning to drive process.

For learners in the hazard perception training group, it will also have had an impact on access to the intervention as the modules were triggered by booking both the theory and practical tests.

Suspension of the practical driving test impacted novice recruitment significantly. As participants were recruited shortly after they passed their test, recruitment was effectively on hold each time the practical tests were suspended. However, this did not have an impact on individual novice participants, as once recruited they were unaffected by the suspensions, in terms of their interaction with the project. Learner recruitment was not affected as target numbers were reached and recruitment ended in early March 2020.

In March 2020, additional questions were added to the test pass survey to ask all participants who passed from that point on about the impact of the pandemic on their learning to drive process (for survey details, see the supplementary appendix document for the project (Weekley & Helman, 2024)). Questions were also added to the topic guides for the interviews.

2.4.2 Reduced levels of driving

As well as formal suspensions, novice participants may have been affected by reduced levels of driving more generally. For example, during lockdowns, only essential journeys were permitted by restrictions.

For almost all participants this will likely have had an impact on the amount of driving experience they were able to get during this period (unless for example they were key workers). For learner participants, nearly all will have been affected in either their learning to drive period or in their post-test driving; only seven participants had completed 12 months' post-test driving by March 2020. All novice participants will have been affected – either in their post-test driving, in their learning-to-drive process, or both.

Impact on the learning-to-drive process has been identified through additional questions in the test pass survey as mentioned above. Impact on post-test driving has been estimated using self-reported measures of mileage during the survey reporting periods.

2.4.3 Cancellation of face-to-face classroom-based education intervention

Before the pandemic, the education courses were delivered in a classroom setting. These were therefore cancelled due to lockdown restrictions. Unlike the other interventions, it did not seem likely that they could continue unchanged once driving tests resumed and therefore a decision was made to transfer the course to an eLearning delivery mechanism. The eLearning course consisted of five modules, available online and accessible on laptops, tablets, and smart phones. Note that while the course contained similar content it was not identical to the classroom course; there was no real-time facilitation or interaction with other attendees. In effect it was an eLearning course covering similar content (see section 3.3 for details). While this was an unavoidable change to the original delivery plan, there were some potential benefits such as enhanced accessibility.

All participants in the education group were offered the classroom-based course, however those who registered with Driver2020 in early 2020 may not have had the opportunity to take part (11% of the education group registered in February or March 2020). The eLearning course was launched on 12th October 2020; all participants in the education group who had not yet passed their test (78%) were also offered this option.

In the rest of this document these are referred to as 'education – classroom' and 'education – eLearning' where relevant.

2.4.4 Implications

None of these impacts should introduce any bias into the study results as all groups (control and intervention) were subject to the same circumstances. Nonetheless the analysis for the

effectiveness evaluation is more complicated to account for changes at different times for the participants; this is discussed further in Weekley et al (2024a) and Weekley et al (2024b).

Another implication of the impacts was on the original intention in the study to achieve an approximate alignment in time of the post-test driving periods in the learner and novice arms. COVID-19 disrupted recruitment (and test-passing) substantially, and this means that the alignment was much less than anticipated.

The generalisability of the findings to future circumstances (where there is no pandemic) may be affected; the pandemic will have significantly altered the learning-to-drive process and post-test driving of most of our trial participants. For example, the time to obtain a licence for this cohort is likely to have been significantly increased compared with what has been observed before. This provides both challenges for the current study and an opportunity to gain further insight into the effect of age and experience on young drivers' collision risk.

A final impact of the COVID-19 pandemic in the learner arm of the study was that is resulted is smaller samples than anticipated, meaning the statistical power in the design as lower than anticipated, meaning that it was more difficult to detected statistically significant results.

3 The interventions

3.1 Logbook

The logbook intervention (delivered by the Driving Instructors Association – DIA) was a smartphone app. Participants allocated to this group were invited to download the app and set up a user profile so that they could use it to help guide their learning to drive.

The app itself provided advice to participants on how much and what types of practice to try and attain throughout their learning to drive period. This included:

1. Trying to achieve at least 100 hours of on-road practice (combined between ADI lessons and private practice) if possible
2. Trying to make sure the following situations were covered in their on-road practice if possible:
    - Driving at night
    - Bad weather
    - Country roads/lanes
    - Congested busy town centres
    - Motorways
    - Dual carriageways
    - Residential areas
    - Driving with passengers
    - Using a satnav
    - Using road signs

Users could log their individual lessons and private practice sessions, applying the above categories to help track progress (see Figure 3-1). People were able to check within the app how they were doing in terms of covering the different driving situations – a running total of driving that had been logged was kept.

The people in the logbook intervention group were also given the opportunity to sign up with a learner driver insurance product with a specialist provider (https://www.collingwood.co.uk/learner-driver-insurance/) at a small discount (£25 discount for a 6 month learner policy or £50 discount for an annual learner policy, and £50 discount for a young driver policy). This offer was available to any participant in this group who downloaded the app. The aim was to mitigate against the insurance cost that can impede learners getting more on-road practice.

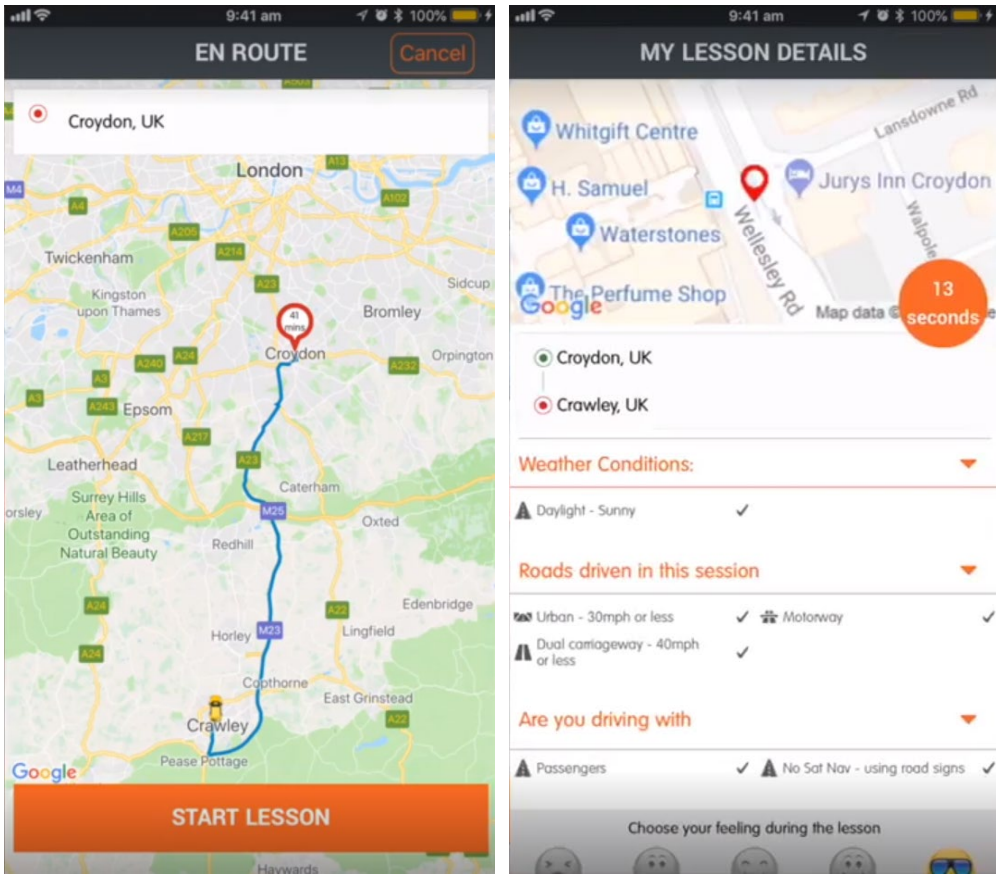

Figure 3-1: Screenshots of logbook app

3.2 Hazard perception training

The hazard perception training intervention (delivered by DriverMetrics) used an online eLearning platform to deliver three modules (each approximately 35 minutes in length) of training and testing clips designed to increase hazard perception skill in drivers. Participants assigned to this intervention group were asked to sign up with the system run by DriverMetrics, and were then invited to do the three modules at the following time points:

- Module 1 – on booking their theory test: The reasoning for this timepoint is that learners should be motivated to pass the hazard perception test element of their theory test.
- Module 2 – on booking their practical test: The reasoning here is that the skill could be boosted close to a point at which solo driving might soon begin.
- Module 3 – on passing their practical test: The reasoning here is that the skill is boosted in early driving, when risk is high.

A range of hazard categories were included (weather, nighttime, bends, cyclists and pedestrians, motorcyclists, motorways, moving off, stopping); some other topics were covered due to their inclusion in the driving test (for example, using satnav) to increase face validity – the perceived relevance of the training to the basics of the driving task, or as advanced concepts (prioritising hazards, safety margins, looking for clues). Figure 3-2 shows some example screenshots.

Figure 3-2: Example screenshots of hazard perception clips from the intervention

3.3 Education course

The education intervention (delivered by Agilysis) was originally designed as a classroom-based one-day (six hour) course (although note that these courses were delivered outside of formal education locations). The design was based around interactivity and discussion, with trained, credible facilitators.

The course was structured into five sessions, designed to be taken at any point in the learning-to-drive process:

- Encouragement of self-reflection of the learners' own personal goals for driving and the identification of driving challenges (both vehicle manoeuvring and situational awareness).
- Hazard perception and hazard prediction (including active interaction with video-based stimuli, and theoretical consideration through questions and answers).

- Insight into their own limitations ('how to drive'), including speed choice and close following.
- Driving choices and planning for different scenarios ('when to drive'), including coping options and strategies.
- Specific personal goal setting in relation to skills practice and positive behaviour planning.

All modules and activities were based on a combination of behaviour change techniques.

During the COVID-19 pandemic, it was decided that it would not be possible to continue with the classroom-based education course even after restrictions were lifted. Therefore, the intervention was redesigned for an online delivery mechanism.

The structure of this was five modules, in line with the five sessions above, which were available for completion whenever the participant wanted to engage. They were accessible on laptops, tablets, or smartphones. Facilitators were still used through recorded content and voiceovers to the modules.

The content was approximately the same length as the classroom session, although this could vary with how participants interacted with the modules, and the modules did not have to be completed in one sitting. All modules and activities in both versions were based on a combination of behaviour change techniques. Once either version of the course was completed, participants were offered access to a follow-up app that they could download; this provided support resources and functionality to review and record their activities in line with their goal setting.

3.4 Mentoring agreements

The mentoring agreements intervention (delivered by the Royal Society for the Prevention of Accidents – RoSPA) was in the form of a website: www.drivermentoringagreement.com. Participants in this intervention group were invited to login to this website.

The website provided general guidance on reducing risks for new drivers and the role that mentors can play in this; it also provided specific information and guidance on the following risks: night driving; driving with peer passengers; urban roads; rural roads; motorways; distractions; driving in poor weather; drink and drugs; seat belts; and driver fatigue. The intervention was based on the 'Checkpoints' intervention used in the US, described in Pressley et al. (2016).

It also provided detailed information on how the Driver2020 mentoring agreement process worked, and a sample agreement and additional guidance and checklists for those completing the process without a mentor. An overview of the process is given below:

- After signing up, the participant was prompted to complete the first agreement. This involved both the mentor (usually a parent) and driver agreeing to seven pre-set driving conditions, such as obeying speed limits, not drinking (or taking drugs) and driving, and wearing their seatbelts.
- The mentor and new driver were then expected to discuss some options for conditions that the new driver must drive within for the first agreement period. These

were based on the key risks faced by new drivers – driving at night and with peer age passengers (Clarke, Ward & Truman, 2002; Ouimet et al., 2015).

    - Time conditions for night driving (e.g., only driving up to 10pm)
    - Conditions on number of peer passengers carried during the day
    - Conditions on number of peer passengers carried at night.

- Around a month later, they received an automated text and email reminding them to review their agreement. At this point (or later), they were expected to revisit the agreement and discuss how it went with their mentor, and what experience they had gained. The aim was that the conditions could be relaxed as the driver gains experience.
- They were then advised to set up a second driving agreement with new driving conditions and set a date to review it around 4 weeks later. As with the first agreement, they were prompted when it was time to review and also encouraged to set the third agreement – again, the timing could be extended if preferred.
- Once the third agreement was reviewed, the programme was completed.

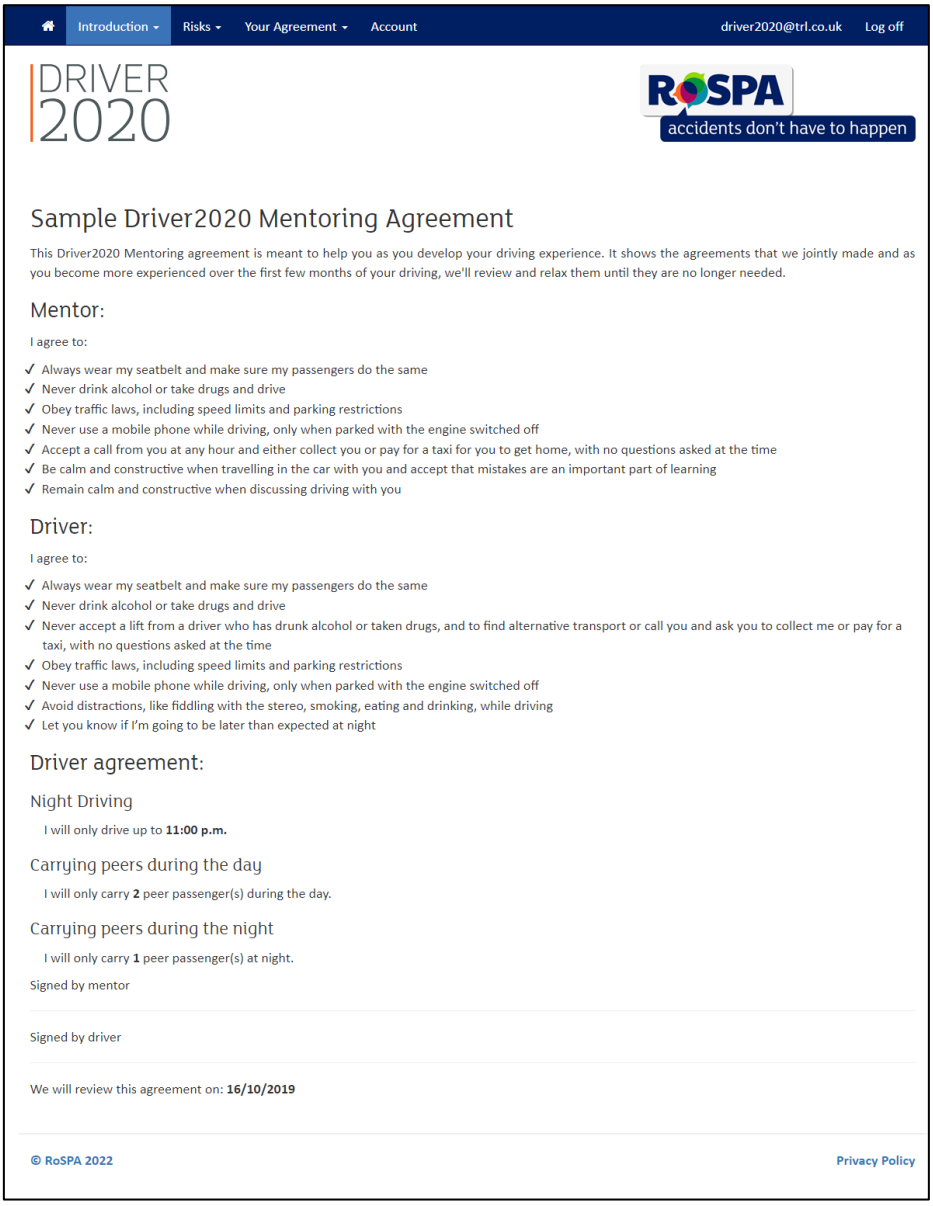

Figure 3-3: Sample mentoring agreement provided on the intervention website

3.5 Telematics

For the telematics intervention (delivered by Trak Global), a new participant was invited to download the Driver2020 telematics app and connect with the Bluetooth in their car. This meant that each time a journey was taken in that car the journey would be recorded by the app. Those participants who did not have Bluetooth in their vehicle could order a (free) Wingman – a small battery-powered device to be affixed to the windscreen that connects to the app via Bluetooth.

Using the technology available within modern smartphones (e.g., accelerometers, GPS), the app recorded telematics data. A custom-built driving behaviour algorithm used these data to provide the driver with a score based on their driving behaviour. This algorithm took into account the following variables when calculating risk (numbers in brackets reflect weighting assigned to the measure by the algorithm in its calculation of risk for feedback): speed vs

road speed limit (25%); speed vs average speed for the section of road travelled (where the dataset permits – 25%); braking severity (17.5%); cornering (course over ground/direction change calculation – 7.5%); time of day (day/night, peak/off-peak – 20%); duration of journey (5%).

The participant was provided with feedback about their driving via the app dashboard (Figure 3-4) in the form of a weekly driving score out of 10 and rating, either red, amber, or green.

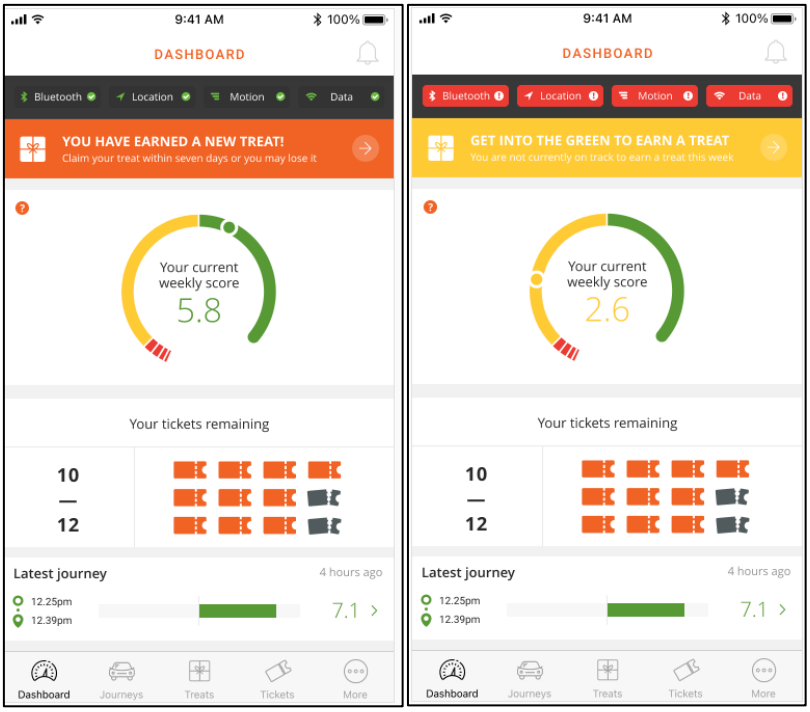

Figure 3-4: Example dashboards from the telematics app

The weekly score was made up from individual scores for speed, smoothness and usage for each journey, and this journey-level information was also available through the app; nudge notifications such as that shown in Figure 3-5 reminded participants of when improvements to their behaviour were needed.

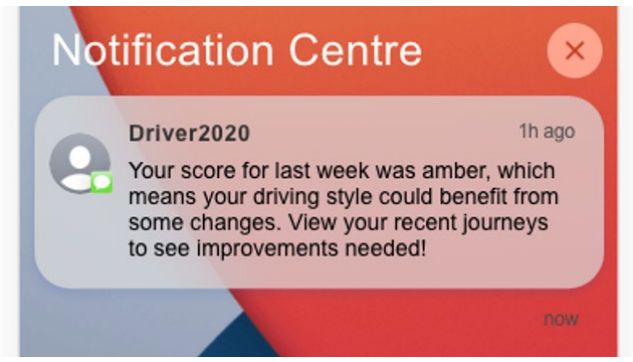

Figure 3-5: Example notification from the telematics app

Participants were incentivised by earning weekly 'treat rewards' (e.g., vouchers for coffee) if the weekly score was 'green', and by retaining their monthly 'ticket' into a prize draw to win a year's free car insurance. Poor driving behaviour would result in a low 'red' weekly driving score; getting two 'red scores' during any month would lead to losing the prize draw ticket for the month, even though it was still possible to improve performance to obtain weekly rewards in the other weeks (Figure 3-6). (Note that the prize draw mentioned here was separate from the main study prize draw for survey completion, which is open to all trial participants, including the control groups.)

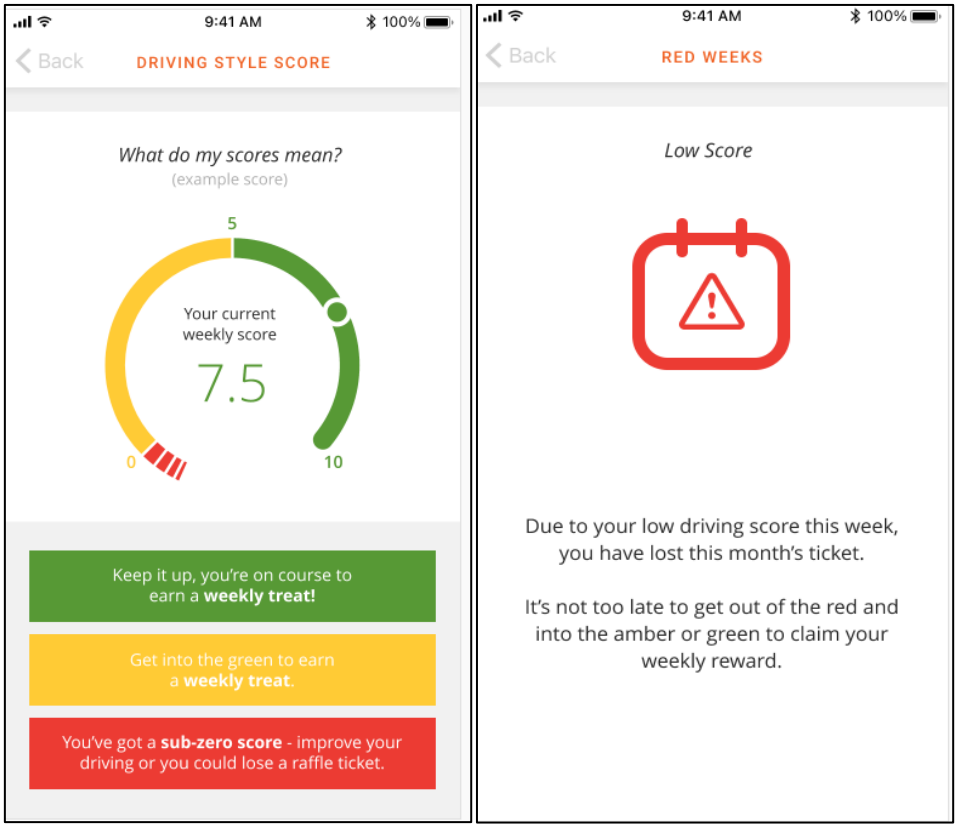

Figure 3-6: Feedback on score from the telematics app

4 Method – qualitative evaluation

4.1 Research question

As stated in section 2.2.2, the aim of the qualitative evaluation was to answer the question:

> *What were the factors that led people to engage with the intervention, or the barriers that stopped them engaging?*

Participants in the trial were free to engage or not; understanding the reasons behind the choices that were made is important in understanding how any effective interventions could be rolled out more widely in the future.

Interviews were carried out with participants in each of the intervention groups. 'Engagement' interviews were carried out with participants who were known to have engaged with the intervention to some degree and were focused on why and how they engaged and what their experience was. 'Non-engagement' interviews were carried out with participants who were known to have engaged very little or not at all and were focused on the reasons why not and what, if anything, would have encouraged them to do so.

Interviews were also carried out with a total of seven representatives from the five delivery partner organisations. See Section 8 for the methodology and findings of these interviews.

4.2 Sample and recruitment

4.2.1 Recruitment

For the interviews relating to engagement, it was necessary to ensure that each participant had engaged to a certain extent with their respective intervention. This information was obtained using system data from the intervention delivery partners. The minimum level of commitment to enable an interview with a focus on 'engagement' for each intervention is listed below:

- Logbook – evidence of any recorded journeys on the smartphone app
- Hazard perception training – at least one module completed
- Education-classroom – attended the session
- Education-eLearning – at least one module completed
- Mentoring agreements – at least one agreement has been set on the website
- Telematics – evidence of recorded journeys on the smartphone app.

These are a very 'low bar' set of criteria, not requiring completion of the whole set of materials available in any of the interventions. Setting these criteria identified 1,551 suitable trial participants. For each intervention, invitations were sent to all participants who met these criteria asking if they would be willing to take part in an interview with a TRL researcher in exchange for a £10 voucher or donation to a charity of their selection. From the 175 responses to these invitations, 134 trial participants were selected and completed an interview. Interviews were carried out with participants who had engaged with the

interventions to differing levels – from those who had engaged only to the minimum level up to those who had engaged fully with the intervention (for example, completing all modules).

For non-engagement, the interviews were with participants who had engaged to an extent lower than the criteria listed above (for example downloaded an app but not used it) or those who had not engaged at all. For the latter, it was important to interview participants who had chosen not to engage with the intervention they were offered, rather than those who did not receive or read the original email invitation to sign up to the intervention. Therefore, along with the invitation to take part in an interview, a short survey was distributed asking participants to confirm the intervention that they were offered and to select (from a list customised for each intervention) a statement which best described their experience. For example, for the education course (both classroom and eLearning) the options were: 1) I didn't receive any information about an education course; 2) I didn't do a course because I wasn't interested; 3) I didn't do a course because of practical reasons (e.g. cost, technology, travel etc.); 4) I wanted to do a course but there wasn't one available; 5) I booked on a course but didn't do it; 6) I did a course; 7) Other (please specify). People who answered 2, 3, 4 or 5 (or 7 if an applicable reason) were eligible for a non-engagement interview. People who answered 1 were excluded as it was deemed that they had not taken an active decision; people answering 6 were excluded as they had engaged. With the non-engagement interviews there is potential response bias, with those people less likely to engage with interventions possibly less likely to respond to requests for interviews. This is an unavoidable limitation and needs to be borne in mind when considering the findings. Note however that the findings should still be useful in identifying some areas for improvement in engagement.

For all non-engagement interviews, invitations were sent when learners passed their test or when novices completed their first year of driving so that the invitation did not affect their level of engagement. For both engagement and non-engagement, interviews were then arranged by email with those eligible who expressed interest, either by sending a link to a Microsoft Teams meeting or scheduling a phone call.

4.2.2 Sample

The breakdown of the sample interviewed across all learner and novice intervention groups is shown in Table 2. The sample consisted of 41 males and 93 females, all between the ages of 17 and 25 (the age of inclusion for the wider project at the point of registration). These were split between those doing engagement interviews and those doing non-engagement interviews.

Table 2: Participants interviewed separated by intervention group

Group		Intervention	# of participants	Gender ratio (M:F)	Age range
Engagement	Learner	Logbook	13	3:10	17-24
		Hazard perception training	14	2:12	17-25
		Education – classroom	17	5:12	17-25
		Education – eLearning	10	3:7	18-24
		Total	54	13:41	17-25
	Novice	Mentoring agreements	12	7:5	18-23
		Telematics	12	3:9	18-25
		Total	24	10:14	18-25
Non-Engagement	Learner	Logbook	8	3:5	18-23
		Hazard perception training	12	4:8	18-21
		Education	10	2:8	18-25
		Total	30	9:21	18-25
	Novice	Mentoring agreements	14	5:9	18-25
		Telematics	12	4:8	18-25
		Total	26	9:17	18-25
		Grand total	**134**	**41:93**	**17-25**

Note that for the education group, the engagement interviews were split by delivery mechanism, but this is not the case for the non-engagement interviews. This is because some participants will have been offered only the classroom delivery mechanism and some will have been offered both, depending on their test pass date, as discussed earlier. Where quotes related to non-engagement with the education course are included in the following sections, they are assigned to the delivery mechanism that the comment addresses.

The split in males and females in the trial overall was approximately 1:1.5, which means that the overall sample for interviews is slightly different from this, and some individual subgroups (for example mentoring agreement and hazard perception training engagement interviews) are substantially different. While the focus of the interviews was on general factors that helped or hindered engagement, it is a limitation of the research that the gender split is different for some groups.

4.3 Procedure

Separate topic guides were created for each intervention and engagement group; topic guides were updated based on lessons learned from early interviews during the process. The final topic guides used for the interviews can be found in Appendix B and Appendix C.

These topic guides were designed to ask participants about their experience of learning to drive and to reflect on the interventions offered to them, and how they used (or did not use) these. As the Driver2020 project coincided with the COVID-19 pandemic, topic guides were updated to allow for additional information to be collected on how the pandemic affected individuals' experience of learning to drive.

Interviews were semi-structured, and conducted either by telephone or via Microsoft Teams, with each lasting approximately 20-30 minutes. Each interview was recorded with the participant's verbal consent, with recordings later being transcribed for analysis.

4.4 Analysis

Interview transcripts were thematically analysed through an iterative process.

Learner engagement interviews were the first to undergo analysis. Four randomly selected transcripts were chosen across the different intervention groups for initial analysis. Two researchers conducted separate analysis on the four transcripts, after which they met to discuss and align theming. This process established a framework under which themes could be captured. A spreadsheet was created with participants shown by intervention in groups of columns, and emergent themes (and sub-themes) shown in groups of rows (and individual rows), with participant quotes relating to a specific theme and sub-theme entered verbatim into the corresponding cell. This spreadsheet approach allowed for an 'at-a-glance' understanding of the most common themes within each group.

Following the initial assessment of four transcripts, analysis was then conducted on the remaining transcripts from the learner engagement group using the established framework. Adjustments were made to the framework as necessary to capture any additional themes not apparent within the original four transcripts, or to rework any theme titles. These adjustments were discussed and agreed on by the wider analysis team.

The remaining three interview types (learner non-engagement, novice engagement, and novice non-engagement) were analysed using a similar process.

Findings from the qualitative analysis are discussed in Sections 5 to 7, and have been broken down into the following:

- Section 5: Context – Covers themes relating to individuals' reasons for learning to drive, their learning to drive experience, and (where relevant) the impacts that the COVID-19 pandemic had on this experience.
- Section 6: Benefits to engagement / what went well – Covers themes highlighting the positive experiences and outcomes associated with the various interventions, highlighting where similarities and differences exist between intervention groups. This includes themes present across both those who engaged and those who did not; though it is worth noting that benefits were reported more often among those who engaged due to the higher level of engagement with the content.
- Section 7: Barriers to engagement / what did not go well – Covers themes highlighting the negative experiences and issues associated with the various interventions, highlighting where similarities and differences exist between intervention groups. This includes themes present across both those who engaged and those who did not.

Relevant quotes have been included in this discussion, copied from participant interview transcripts. Quotes are anonymous, with only individuals' gender and age (at the time of interview) being detailed in parentheses following a quote. In Sections 6 and 7, participants' intervention groups are also reported.

4.5 Limitations

The qualitative analysis in this report should be seen as supplemental to the effectiveness evidence presented in Weekley et al. (2024a) and Weekley et al. (2024b). Due to the nature of the qualitative research, the findings are not intended to be generalisable, however the sample was aimed at reflecting both those who engaged with the interventions and those who did not. The content in this report reflects the interpretation of interview data from learners and novices about their use (and non-use) of the interventions, and opinion (albeit informed) about delivery from delivery partners.

As discussed within the text, two specific limitations of this analysis are:

- Potential response bias for the non-engagement interviews, with those people who did not engage with interventions possibly less likely to respond to requests for interviews more generally. This could result in reasons for non-engagement being biased towards specific barriers; for example, in those interviews there may be an under-reporting of reasons related to general feelings of apathy or lack of interest.
- The subset of participants interviewed for this qualitative research comprises a greater proportion of females than the sample of participants taking part in the wider effectiveness trial. This could result in an element of gender bias in these findings.

5 Findings – Context

The first section of the interview with participants discussed the general context around learning to drive, including their reasons for learning, their learning to drive experience, and the impact of COVID-19. Whilst not directly answering the research questions, this provided useful context to inform the later interpretation and is discussed in this section. The key insights gathered were:

- Learning to drive and driving were seen as challenging (in terms of skill, and finances) but important, for the flexibility and freedom it provides. Participants interviewed felt that the learning process would not completely prepare them for all the driving they would need to do after they passed their test. Support from family and friends was seen as critical.
- Those affected reported that COVID-19 had a major impact on their learning to drive, especially in terms of test cancellation and delays, but also in terms of loss of practice opportunities and the different driving context during lockdown periods.

5.1 Reasons for learning

To get a complete understanding of young and novice drivers' learning experience, it was important to understand the factors that motivated them to learn. This part of the interview also served as a warm-up to get people talking about their driving and informed the following analysis.

Participants viewed driving as a means to more **flexible journeys**. It was found that the most common reason for learning to drive was to gain more independence, leading to less reliance on public transport: "*…taking the bus would take an hour to get somewhere that's a 10-minute drive away*" (F, 19) and less reliance on other people: "*My main reason was just so that I was less reliant on my parents*" (F, 18). Driving was seen to increase the convenience of journeys, for example the skill would enable them to *"be able to save time when travelling"* (M, 23) and it "*makes it easier to do a lot of different things*" (M, 18). In terms of independence, driving was linked to the feeling of freedom with anecdotes such as "*I wanted to learn to drive because I think there's a massive freedom in driving. I think if you are lucky enough to have access to a car, or have your own car, then you can gain a lot out of driving for yourself*" (F, 19) and "*I wanted to be more independent and take my family out and go to places that I wouldn't normally go to because they're quite a hike*" (F, 20).

Driving was viewed by participants as an important **life skill**. Some participants had "*always liked the idea of driving*" (M, 19), while others saw it as something important for the future: "*…at some point in my life I'm going to want to learn to drive*" (F, 19). Some participants felt it was important to learn to drive as soon as they could: "*I think it's going to be easier to do now than when I'm older and have got more commitments, so I did it when I was 17*" (F, 19), "*I knew if I didn't learn as soon as possible I just wouldn't do it*" (F, 19) and "*I wanted to just get my test done and just get the driving test done as early as possible*" (F, 19). Additionally, learning to drive seemed to be linked to other milestones for young people, that "*it just feels like something you do when you're at that age. You know you finish high school, you go to college, you learn to drive, you go to uni*" (M, 19). This suggests that, for some, driving is a skill that goes alongside all the other skills that they are learning at this point in their life.

While the two previous themes relate to why people *wanted* to learn to drive, the next relates to why participants felt they *needed* to. Many participants stated that they **lived in an area without public transport** and therefore driving became a necessity to access their place of work or education. The following quote illustrates this: "*The main reason was just easier transportation because at the time, I lived in a very isolated area, and I was in college so I had to take the bus a lot. But then on the weekends there was no bus to go into town or anything so I had to – it was a two hour commute, or a 40 minute drive for me. So it was kind of a no-brainer*" (F, 19). Saving travel time was mentioned a lot during the interviews: "*…the main reason for me wanting to drive was because my school is around 21 miles away from [my] house. So, it would be much quicker and better for me to drive rather than take the train and bus*" (M, 18); "*…my job was quite far away from where I lived and I had to walk 40 minutes to get to my work, so it was more practical if I learnt*" (F, 19), as well as the perceived saved costs: "*I needed to learn to drive, because it was a lot cheaper to do that than get public transport to school*" (M, 18). Lastly, some participants viewed their driving licence as giving them opportunities that would not be available otherwise: "*I knew it was important because a lot of job applications I'd seen required me to drive and some of them even to own a car*" (F, 23).

5.2 Learning to drive

The second section of the interview served to further expand the conversation around the wider context of learning, to help inform the thematic analysis around engagement.

5.2.1 Features and driving conditions

Participants noted that there were elements of driving practice that were not covered in their lessons, that could have provided useful practice for the continuation of their driving. For example, learners reported not practising driving on **motorways**: "*I had pretty much driven on all types of roads apart from the motorway*" (F, 19). This is an expected finding, as it had only been made legal to drive on motorways as a learner (and then only with an instructor in a dual control car) in June 2018, but it was found that that some participants had additional lessons to help their motorway driving, post-test: "*I had no motorway driving before passing my test, but I did do a lesson in that afterwards*" (F, 19). This suggests that motorway driving felt sufficiently different to driving on other road types and that novices wanted additional practice to build on the skills they had learned in their lessons.

Related to this, a participant's **familiarity with different road types** during their learning experience appeared to impact on their post-test confidence driving in unfamiliar road environments. For example, participants in rural areas stated they were less familiar and therefore less comfortable with driving on dual carriageways and those in urban areas stated they were less familiar and therefore less comfortable with driving on country roads. The following quotes illustrate participants' experiences: "*The only thing that I'm not completely prepared for is city driving. Because I don't really live in a city and ever since I've been there with my parents, it feels a lot more stressful and a lot more people out and about*" (M, 18); "*…it's quite dependent to where you live. I ended up learning [in] two areas because I had to move to uni halfway through my lessons because of COVID, but one area was all junctions and no roundabouts and the area that I passed my test in is all roundabouts*

no junctions. So, kind of going between them was actually a little bit more difficult because you're sort of forgetting how to do one of them" (M, 19); "*I didn't drive on motorways. I drove on A roads, like once or twice and never countryside or anything like that. So, it was mainly city roads, 30 mile per hour speed limits"* (M, 19).

Other than the road type, participants commented on the impact that **familiarity with different driving conditions** during their learning experience had on their experience driving after passing their test. Again, a theme was noticing changes to the driving task that they did not experience as a learner. Firstly, **night-time driving** was new to many participants: "*…driving at night, because I'd never done that as a learner. I didn't find it too difficult but it's just different isn't it really*" (M, 18); "*…most of the driving I did was during the day, so I didn't have that much night-time driving experience*" (F, 18). Additionally, participants had to adapt to driving in different **weather** conditions. There were many participants that "*hadn't really driven in the dark that much, or the snow*" (F, 18). A change in seasons seemed to have the biggest impact in terms of experiencing different weather conditions, particularly from summer to winter as it introduced the dangers of driving on ice or in rain: "*I did all my driving during the day and through the summer is when I learnt, so the weather was really, really nice last summer and I had barely any experience driving when it was rainy, and the road conditions were poor*" (M, 18). They commented that they had learned the theory about these dangers in their lessons but had not had the opportunity to practice driving safely under these conditions: "*Icy conditions, I know the theory, what you're supposed to do but I've never actually driven in it*" (F, 19). One participant argued that learning to drive in the winter may provide a more holistic learning experience in terms of practising driving through different weathers: "*…it's also hard, right, to find these kinds of harder situations, so like heavy rain or like random icy situations. But I think it can be an advantage learning in the winter, for example, when it is a bit harsher.*" (F, 23).

5.2.2 Family input

To provide additional context on their learning to drive experience, participants were asked whether they received support of any kind from family or friends.

Participants reported either receiving **funding** for their lessons and/or insurance from family or friends, or paying for these things with their own earnings: "*my gran, my brother and a few friends have helped me pay for my first lessons*" (M, 17); "*My parents paid for the insurance on the car and then I've paid for my test and my provisional licence, and stuff like that*" (F, 17); "*My mum and dad pay for my lessons*" (F, 18); "*I was put on my mum's car insurance*" (F, 18); "*I paid for all the lessons myself out of my wages but my parents are paying for petrol and the insurance while I was learning to drive but I'm paying my own insurance now I've passed*" (F, 18). This shows that young people often have financial support from family to fund learning this life skill.

Other support from family included having **lessons** with friends or family outside of lessons with instructors: "*I did quite a lot of practice with my mum and my dad*" (F, 18); "*I did a mixture of with my parents and with a driving Instructor"* (F, 18); "*I've gone out with like my boyfriend and my mum a few times to try and like, if I was having to drive somewhere that I hadn't been before, I'd like drive with them in the car so that they could help me*" (F, 18). Those that had additional practice often described feelings of increased preparation: "*I think*

I actually got more [practice] because I did so much practice with my parents in lockdown" (F, 18); "*I started practising with mum outside of lessons to try and progress a bit faster and just have a bit more practice to consolidate what I'd done*" (F, 19); "*I felt very well prepared because I had a mixture of driving lessons and private driving with my parents, as well, for two years, so I felt well prepared to start driving on my own then*" (M, 19). This suggests that participants with extra support and practice found it very useful.

Lastly, some participants that were taught by their parents were wary of picking up **undesirable driving habits**: "*I'd picked up a few bad habits, there was things that my instructor didn't want me to do I picked up while I was driving with my parents*" (F, 18); "*The instructor taught a certain way, and my dad taught a different way*" (F, 18). The benefits of a qualified driving instructor were appreciated as they were more familiar with the current test than parents were: "*…the driving test has changed slightly since they passed 30 years ago so it was a lot of arguments about what was the right thing to do and things like that*" (F, 18), and that instructors are more conscious of good and bad driving habits: "*I think having a professional there prevents you picking up maybe some bad habits that some people might pass on without realising*" (F, 23).

5.2.3 Things people found difficult

During the interviews, participants talked about what worried them and what they found difficult about learning to drive. Various driving manoeuvres and elements of car control, listed below, were reported as being particularly challenging among the sample. These task demands were largely felt to be difficult as they were mentally demanding or occurred very early in their learning experience when they had no prior knowledge or lacked self-confidence.

Roundabouts: Roundabouts were frequently raised as a challenge among our sample at all stages of driving experience, including among those who had passed their driving test: "*Roundabouts I'm finding a little bit difficult because there's just a lot to remember*" (M, 17); "*Roundabouts I found most difficult*" (F, 17); "*I probably feel less safe when it comes to roundabouts where it's quite easy to make a mistake if you're not properly paying attention*" (F, 17). Roundabouts can be very complex, with many having multiple lanes and high traffic volume. They require attention to be spread across various elements. It is no surprise that learner and novice drivers can find roundabouts challenging and perhaps highlights a need for greater support and experience with them during driving practice.

Junctions: As with roundabouts, junctions require a driver to spread their attention across various elements (especially on a right-hand turn). Some in our sample reported these as a challenge, particularly where self-confidence was lacking: "*I think just getting enough confidence to trust myself to make the right decisions and sort of go at roundabouts and junctions*" (F, 17).

Spatial awareness: Respondents in our sample also found having an awareness of the size of their vehicle to be a challenge: "*Just obviously spatial awareness was the biggest thing because obviously I went from driving a small car to a big car and then down to a really small car so I had the mixture of all of it, really. But as I've got used to driving a smaller car, it's got a lot better*" (M, 21); "*… just figuring out the dimension of the car, like parking spaces, reversing, how far back I need to go, all that kind of stuff. The spatial awareness*

aspect, I'd say" (M, 23). Learners interviewed highlighted a particular problem in gaining experience with different vehicles, which impacted on their confidence with certain manoeuvres like parking and maintaining an appropriate position on the road.

Parking: Respondents reported that parking manoeuvres, including both parallel parking and reverse bay parking, were a challenge: "*At first I found parallel parking really hard, and I couldn't really do it without any assistance…*" (F, 17); "*I'd say the biggest challenge for me was the reversing into a bay manoeuvre*" (M, 18). This may suggest that the level of precision required to complete these manoeuvres may generate stress among inexperienced drivers.

Dual carriageways: The high-speed and multi-lane nature of dual carriageways generated stress among learner and novice drivers: "*The scariest bit was probably like going on like the dual carriageway for the first time alone*" (F, 17).

Slip roads: Slip roads were reported as being difficult potentially due to the cognitive load required of spreading one's attention across various locations: "*Probably slip roads because you've got to concentrate on going forwards as well as looking behind, and to the side*" (M, 18).

Gears and clutch control: During the early stages of learning to drive, many reported difficulties with learning to manage the vehicle's clutch and gears: "…*the combination of needing to maintain a good level of control over the car without looking at what you're doing necessarily, changing gears and everything. Using your feet properly, clutch control, doing all of that whilst in busy situations*" (M, 17).

This list highlight the areas found most difficult by the new drivers interviewed, and suggest that new drivers may value additional focus on these areas to help build their confidence. Many of these are related to vehicle control skills and the findings here suggest that the new drivers interviewed may be more focused on the basic skills during early driving. However, as noted in section 1.1, mastering vehicle control skills does not appear to guarantee safety – at least not in isolation. Skills such as hazard perception and hazard anticipation seem to offer a greater benefit to safety (Wells et al., 2008). Finding ways of improving hazard perception skill will be beneficial to new drivers in a number of ways, including helping them in some of the situations listed above, which benefit from better anticipation.

Beyond the specific types of vehicle control and situations detailed above, participants reported more general challenges. Some mentioned **navigation** as a challenge. This was a more prominent problem among those who had passed their driving test and had begun driving independently in unfamiliar areas (i.e. were not relying on someone telling them where to go): "*I think I was probably most worried about unfamiliar situations and roads*" (F, 19); "*Probably navigating, having to use the satnav whilst driving. Because whilst you have to do it in your test, it's obviously almost on a smaller scale because you're doing an area you've driving so many times that it's not really the same as when you're actually in the real world having to find places and navigate whilst focusing on the road*" (F, 19). These novices were now having to learn how to manage their concentration between the driving task and following a sat-nav or street signs, without the support of an instructor. It is worth noting that an independent driving task is now a feature of the UK practical driving test, where a

learner driver is required to drive to a specific location following either a sat-nav or street signs with no direction from the examiner. Learners are now more likely to receive training in these elements during their learning as a means of preparing for this part of the test (Helman et al., 2017). However, the responses of participants in this study suggests there are some individuals who particularly struggle with independent navigation who may benefit from further support in this area.

Respondents also reported issues caused by **other road users**. Learner drivers reported feeling pressure from other vehicles on the road through aggressive driving behaviours such as tailgating and speeding: "*…sometimes you get normal drivers or experienced drivers, or people that have their licences, so non-learners, that sometimes when they see a learner plate, they kind of take advantage of that and they undertake you or they drive quite dangerously, or they honk at you if you're going too slow, but you're not going slow, you're going the speed limit*" (F, 24); "*I was worried about other drivers actually because a lot of people go, you know, tailgate you quite a bit when you're driving, and obviously if you're going at the speed limit people are always up your bum*" (F, 21). Furthermore, participants interviewed also raised concerns around the unpredictable nature of other road users, such as vehicles failing to indicate or pedestrians suddenly walking out onto the road: "*I don't trust indications or lack of, and it's taken me a while to try and anticipate what people are going to do but now that I've been driving for a bit longer I find it a lot easier. From the angle of the car and the speed they're going. But when I first started I found that really difficult*" (F, 17); "*Mainly being on the road with other drivers, not knowing what other circumstances might happen on the road possibly… Probably cars pulling out when you don't expect them to*" (F, 18).

Lastly, the theme of **anxiety** was common across all groups. This emerged in various contexts, including in relation to the difficulties mentioned above, as well as at various stages of learning, from first getting behind the wheel to the first independent drive. On top of the anxiety felt in relation to the difficulties mentioned above, people reported having fears of being involved in or causing a road traffic accident: "*Having an accident was mainly my biggest concern*" (F, 19); "*I was more focused on the actual driving, making sure I didn't get into an accident and making sure I don't hurt anybody*" (M, 19). There were also those who were worried about receiving a traffic penalty: "*I was a bit nervous. I would always drive with my parents or with my brother, somebody who was older than me, somebody who had a bit more experience just in case anything happened, maybe I was in an accident or the police pulled me over or something*" (M, 19). These are arguably reasonable concerns to have while driving, but these concerns would appear significant for this group of people during the early stages of driving, which may be due to a lack of experience and confidence.

5.3 COVID-19 impact

Another topic covered in this section of the interviews, for those participants affected, was the effect COVID-19 had on their learning. This broader contextual factor was included so that it could be considered in interpretation of the discussion around engagement.

The timing of the COVID-19 pandemic had a significant impact on participants' learning-to-drive experience. As the country went into lockdowns, **driving lessons were cancelled**. Participants recalled not being able to take lessons for a period of months, which affected

their learning-to-drive experience: "*I didn't have lessons for six to seven months*" (F, 21); "*I had no lessons for two to three months*" (F, 23); "A*ll the driving instructors including my driving instructor, stopped taking lessons. I did not take a lesson for almost six months I'd say, six to seven months, which was very hard*" (M, 20). Even private lessons with family members were affected: "*I couldn't then have lessons and we didn't want to go out, like me and my dad, because it wasn't essential travel and we didn't want to get in trouble or anything*" (F, 18); "*I had been doing lessons for a few months before the start of the pandemic and then once the pandemic hit the restrictions meant that I couldn't go doing private driving with my parents either anywhere*" (M, 19).

The introduction of COVID-19 restrictions also meant that a lot of **driving tests were cancelled**, which affected a large number of participants in the Driver2020 project: "*My test got cancelled four times I believe*" (M, 19); "*I had to move my test about three times because every time I could go out to drive there was a new lockdown"* (F, 19). This uncertainty continued with the second and third lockdowns, with many last-minute test cancellations: "*My original test, I think it was something like the 19th of March and I was all ready and then the day before, they cancelled all driving tests… it was the night before, ready, I'd prepared myself and then that was it and it wasn't until December that I eventually did it"* (M, 18); "*I was meant to take my practical test, it got cancelled like a week before*" (F, 24).

When lockdown restrictions eased in between lockdowns, participants were able to continue to take lessons, however there were difficulties brought about by a **change in learning conditions**. Driving instructors were very busy, making it harder to continue learning: "*When lessons happened it was a lot harder to get hold of a driving instructor because they weren't doing as many hours*" (F, 22); "*We didn't have as many lessons because of social distancing*" (F, 18); "*…my driving instructor was jam-packed full of people trying to get their lessons in"* (F, 21). Additionally, participants reported feeling uneasy taking lessons with precautions in place, as illustrated by the following quotes: "*We had to keep the windows open and stuff and wear masks"* (F, 19); "*…the windows had to be down; the mask – so that makes noises really loud, and they can make you startled*" (F, 24); "*I'd have to sit in a tight space in a car with my instructor and everyone was still worried, and I was worried as well*" (F, 20).

Furthermore, where participants were able to take lessons again, either with an instructor or their parents, some reported on the **change in driving conditions**. For instance, while many lockdown measures were still in place (e.g., homeworking, restricted travel) roads had significantly less traffic which was felt by some to make for an easier learning experience: "*And obviously the roads were a lot quieter during the pandemic, so it was probably easier to learn*" (M, 18). It was also felt that the quieter road environments made other road users drive more recklessly, which created an added stressor while learning during these abnormal conditions: "*…occasionally, when I drive during lockdown, people are just going reckless because obviously it's quiet*" (M, 22). Such traffic conditions do not reflect the norm, meaning it could be argued that these learners were not gaining true real-world driving experience and may not have been adequately prepared for the cognitive load associated with driving in high-traffic road environments. This problem was seemingly made worse by the increased traffic participants reported they experienced once lockdown measures had been reduced: "*I found city centres were more busy, and motorways and stuff were quite busy when I first started, because that was sort of when the restrictions were first lifted so*

everyone went crazy and started travelling everywhere" (F, 19); "*…when we started to come out of lockdown and places started to get busier, that was actually a really big thing, was that I had been learning to drive and then passed my test in a time where there were barely any cars on the road and barely any cars in the car parks, so that was really something that I was like, 'I don't know what to do now there's other cars'*" (F, 25).

The period of time when learners could not take lessons meant that many had to **relearn skills** that they had not been able to practice during the lockdowns. An impact of COVID-19 was that participants had to pay for lessons that they would not have needed had there not been a gap in learning: "*I had to take a massive gap and I had to take three to four lessons to get back to where I was before each lockdown. So definitely I had about 10 or so extra lessons before I was ready for my test"* (M, 18); "*Starting back driving after the restrictions were lifted was a bit like learning from new again"* (M, 19). The gap in learning also led to some participants having **a loss of confidence** in their driving abilities due to lack of practice: "*I didn't have any practice for about four months straight. That impacted me and I lost my confidence a bit there*" (F, 18).

The respondents offered various perspectives on the **amount of driving practice** they felt they that they had because of COVID-19. Many of the learners interviewed felt that they gained more practice due to the stop and start nature of the lockdowns and lessons: "*I think because my test was delayed twice during the pandemic, I got more driving practice*" (F, 18); "*I think I actually got more [practice] because I did so much practice with my parents in lockdown*" (F, 18). On the other hand, many novices interviewed felt that they lost out on driving practice *after* they passed their test, as people were leaving their house less: "*So I probably drove a lot less than I would have if we hadn't had the COVID restrictions*" (F, 19); "*I couldn't go out driving for some time whilst COVID was on because of the restrictions and stuff. So, after not driving for a while from being in lockdown – I remember being a bit nervous to go back because I hadn't been driving for that long before*" (F, 19). These quotes link back to feelings of having to relearn driving skills due to the restrictions and interruption of driving practice.

When restrictions eased, people could start booking driving tests. A very prominent theme from the interviews was the **competition to book tests** as a consequence of months of cancellations. Many participants reported tests not being available to book for months due to the sheer volume of demand: "*I know a lot of my friends still haven't been able to get a test booked or anything yet. There's like year waits and stuff*" (F, 19); "*the pressure gets worse by the day because more people are turning of age to drive and it's just like it then puts so much pressure on people who are merely trying to pass or need their car for the sake of getting to work*" (F, 25); "*Booking my test did take a long time because I had to wait in a virtual queue. There was about 100,000 people on this virtual queue"* (F, 19/20). The competition for tests increased feelings of stress and pressure amongst participants, as they were so hard to book. Some participants reported that they took their test in unfamiliar test regions because they were available sooner than tests in areas that they had practised in: "*…because of COVID, my test had to be moved to somewhere that I hadn't learned and that was not a good experience*" (F, 18). Others had to consider whether they would need to retake their theory test if they could not book and pass a practical test within the expiry window: "*…a worry for me that the theory certificate would expire before I even got around to booking a test*" (M, 18).

All of the factors mentioned above led to a reported increase in feelings of stress and perceived difficulty of the learning-to-drive experience.

6 Findings – benefits / what went well

This section presents the things that people reported as being positive about the interventions and suggests ways in which this may be important for engagement. The key insights from this were:

- A major theme noted was the desire to have interventions that helped with licence acquisition.
- Other positives reported included the quality of delivery, information that improved knowledge, awareness and confidence, ease of use, help with self-pacing, and opportunities for self-reflection.
- For some specific interventions:
    - For the classroom education intervention, the importance of the course instructor was highlighted, as were the benefits of interaction with other learners, and some of the exercises (especially the virtual reality (VR) hazard perception exercise).
    - For the hazard perception training intervention, the helpfulness for license acquisition was highlighted.
    - For the telematics intervention, the usefulness of the direct feedback from the app was highlighted.

6.1 Similarities between interventions

This section details the reported positive aspects that were shared across different interventions. These findings indicate that although each intervention was unique in design and purpose (and in the group to which it was delivered, and when), they were able to achieve some similar positive effects, at least for the sample presented here (which as noted is overall slightly more composed of females than the entire sample in the study). Positive aspects that were unique only to a single intervention are detailed in section 6.2.

During the interviews, participants were asked to reflect on the intervention that they had been assigned to. Participants with high levels of engagement often gave positive feedback on the **delivery** of the intervention. For the interventions with a presenter (education-classroom and education-eLearning), positive delivery was in particular defined by the interactivity and understanding of the course: "*I found the people quite relatable, and the things they were saying, it was quite easy to understand, the interactive parts*" (education-eLearning, F, 24); "*I think it was [good] because it was very interactive. There wasn't just like someone talking at you. There was quite a lot of activities to do"* (education-classroom, F, 17). Additionally, the courses were thought to be easy to use and had a straightforward user interface, provided that there were no technology issues (see section 7.1.2): "*I thought it was very intuitive and very hands on. I did get a lot out of it*" (education-classroom, M, 18); "*It was very easy to access. I didn't really have any issues trying to access it*" (education-eLearning, M, 19); "*It was very intuitive*" (education-eLearning, M, 18).

With regards to the delivery of the other interventions (i.e. those that did not feature a presenter and relied instead on a screen interface), respondents also reported that these

were generally **easy to use**. This was in regard to the user-interface of the various apps and webpages being laid out in a clear and understandable way, minimising any confusion: "*It seemed just easy to use and well-laid out, easy to read*" (mentoring agreements, M, 19); "*I felt like they were pretty intuitive, so even if I didn't read the instructions it was really easy to know, or would have been really easy to know what I was meant to do*" (hazard perception training, F, 25); "*Simple layout and the use of symbols rather than just all words*" (logbook, F, 18). Participants also felt that **information was well-presented** across the interventions, specifically that content was presented in an interactive or easily digestible way: "*It was engaging. It had videos and they had the interactive bit as well*" (hazard perception training, M, 17); "*I do remember the feedback being quite broken down so it was quite easy to see what it was referring to*" (telematics, F, 18)

Participants were complimentary of the **content** of the interventions. Learners who engaged with the education-classroom and logbook interventions and novices that engaged with the telematics intervention appreciated the opportunity for **self-reflection**: "*So it's nice to be able to log it and to see like this is how far I've come and this is where I want to be, because you certainly, when you pick it up, you start to pick it up and you don't even notice that your clutch control, how much that's improved, because it's all – until you reflect on it. And I think, no, I think that was really, really helpful*" (education-classroom, F, 23); "*One thing I really liked about it was that it's really easy to see what you're doing, how you're progressing, how far you've come from where you started and stuff like that*" (logbook, M, 18). Learners reported liking to be able to track their progress through the app and have an objective way of showing themselves how much they have improved since they started learning: "*It makes it easier to track my progress; I know what my strong points are*" (education-classroom, F, 17); "*…it's nice to be able to log it and to see like this is how far I've come, and this is where I want to be*" (education-classroom, F, 23); "*I think the app has made a great deal of influence on my driving. It has made me perform better as well as allowing me to see my progress and improve on that*" (logbook, F, 17). Some participants felt that the reflective nature of the interventions helped them focus on their weaker driving skills, of which they were not always aware: "*If one night you were driving in the rain and it's slightly dark and you struggled with it maybe that's something that you need to improve on, for example*" (logbook, F, 17); "*It's a really good way to see how you're progressing and where you can adapt, where you can improve your weak areas as well*" (logbook, M, 18); "*I used to use the feedback to improve and stuff like that, and know where I went wrong in areas and stuff*" (telematics, F, 19).

The reflective nature of the Interventions provided **constructive feedback**, by providing evidence of how well journeys were going: "*By knowing how many hours you've been on the road it gives you a certain feeling of you know more than when you started because obviously you've got the experience and you can see that on the app*" (logbook, F, 18). This was reported to be a particular benefit for novices who were no longer receiving feedback on their driving from driving instructors: "*Very, very useful. It's just good to be able to actually look after your journey at how your driving is doing. You really don't realise it whilst you're driving. So, being able to have the scores is super handy*" (telematics, M, 21); "*So that's sort of given me a confident booster as to what shall I do, how can I improve" (*mentoring agreements, M, 20*)*.

All interventions were described as having content that **raised awareness** of being a safer driver and the dangers of driving. The interventions raised awareness of what the participant needed to be aware of in their own driving; this was particularly prominent among those in the education-classroom intervention: "*the [Virtual Reality – VR], it kind of shows you how much you have to look around. And I think I was much more observant and looking in my mirrors afterwards"* (education-classroom, F, 17). Examples were also apparent from other interventions: "*It definitely made me more aware of using my mirrors and kind of being more aware of everything going on around me at 360, not just in front of me. And that was something I was definitely aware of once I finished*" (hazard perception training, F, 24); "*it's making you more aware of the dangers*" (logbook, F, 18); "*I think it has reminded me to be aware of drivers around me. And also, be aware of sort of new drivers, and sort of learner drivers, drivers with P plates who have just passed*" (mentoring agreements, F, 18).

With regards to the hazard perception training and the hazard perception elements of the education-classroom intervention, participants also felt their awareness was raised with regards to their **ability to anticipate hazards**: "*…it has helped me be aware of hazards and what I need to be aware of*" (hazard perception training, F, 17); "*…by doing the hazard perception, I kind of got used to doing that. So, I kind of felt I subconsciously looked out on the road more and around me*" (hazard perception training, F, 17); "*with those VR headsets there were a few videos where maybe I didn't see someone pulling out or maybe I would have gone straight ahead at a junction whereas someone else would have waited. So, it made me more aware of different safety options and how maybe I should do things differently to maintain my own safety and the people in the vehicle with me in future*" (education-classroom, F, 23). This would suggest that these interventions were having a positive influence on improving participants' hazard anticipation skills.

Further to encouraging self-reflection on one's driving behaviour and experience, some of the interventions allowed for **self-pacing**. Specifically, this was present among individuals in the logbook and mentoring agreements groups as these interventions were designed to put a level of control into the learner's own hands and allow them to shape their own practice. With the mentoring agreements, an individual was able to set boundaries on their own driving experience until they felt comfortable and confident enough to take that step into a more challenging driving environment (e.g. night-driving): "*Instead of just like being thrown in at the deep end it allowed me to like pace myself, especially after becoming a new driver. Because it is quite scary when you – I didn't realise how bad it was until you go out on your own, and I'd say it gave me a chance to pace myself and go at my own speed*" (mentoring agreements, F, 21). The logbook was intended to achieve a similar purpose by allowing an individual to identify areas that they may not have experienced yet (or wish to gain more experience in) and gave focus to these areas in their driving practice: "*It pushed me even more to put myself in new situations and try everything*" (logbook, M, 17). The mentoring agreements also allowed for individuals to relax their own restrictions for certain situations such as work commitments: "*…when I first started it, it was driving at night, and not too late, however afterwards when my job started allowing me to work a bit later it sort of got pushed back a bit, a bit later*" (mentoring agreements, M, 18).

Many of the previous quotes suggest that participants felt that the content of the interventions provided a reminder and more in-depth understanding of driving safely,

building on their previous knowledge. Comments were also made to suggest that the courses **equipped the drivers interviewed with knowledge** about driving safely, that they felt they would not have been aware of without the interventions: "*I think it makes you think about things that you perhaps wouldn't have before, so now I do have those sorts of things on my mind*" (mentoring agreements, F, 19). Examples of this were prominent for education-eLearning and mentoring agreements. New topics included how to drive in dangerous weather: *"I didn't know about the ice one before*" (education-eLearning, F, 19), as well as time of day: *"When I first started driving I thought, OK, I don't want to drive at night because I might be tired and I might do this and I might do that, something might happen. But after watching [the e-learning module], I realised it's not just – it's just not how I'm driving, it's how other drivers are driving as well."* (education-eLearning, M, 19).

In addition, some participants felt that the education-classroom, education-eLearning, and hazard perception training were **beneficial for the theory test**: "*it was valuable in terms of revising for my theory test*" (education-classroom, M, 17) "*It's great practice for theory tests*" (education-eLearning, F, 21); "*some of the stuff what I've picked up on the video clips it was actually like I could relate it to questions on my theory*" (hazard perception training, M, 20). This is the only theme that was present for only the learner intervention groups. As novice participants had already passed their theory and practical driving tests, and the novice interventions were not designed to prepare individuals for these tests, this theme was not present among the mentoring agreements and telematics intervention groups. The education and hazard perception training interventions in particular were intended to equip participants with relevant knowledge to prepare them for the theory test. This was a major theme for the hazard perception training as it gave users experience of the hazard perception element of the test. It is worth noting that this theme was less prevalent among those who had already passed their theory test at the time of being introduced to their given intervention, though some participants who had already completed their theory test still recognised the benefit of it: "*other people might find it useful because they hadn't done the test*" (education-classroom, F, 22).

The fact that learners perceived that these interventions were beneficial for helping them pass their theory test was a specific instance of a wider theme among the learner interventions; participants who were learner drivers reported being most keen to engage with elements of the interventions that they perceived as being useful for progressing through the licensing process: *"…it was really helpful…because on my theory test the app that I was using it only had a certain amount of clips on it, so it was good to get a different range of clips to help."* (hazard perception training, F, 18). There was seemingly little motivation to engage from a safety perspective until after they passed their test: *"I think it's a good idea to spend a bit more time, when you've passed, thinking about what your boundaries are and what you feel safe doing, and not just – like, I know you feel like you're just free now, but there are still considerations to make, and it's good to reflect on that a bit"* (mentoring agreements, F, 19). Instead, the primary reason given for engagement up until that point was knowing exactly what to do in order to pass the theory and practical tests: *"…it's a really good way to see how you're progressing and where you can adapt, where you can improve your weak areas as well"* (logbook, M, 18).

It is encouraging to see that the interventions influenced the **feeling of being a safer driver** for some participants: "*I feel like I'm lot safer on the road than I would have been before I*

took the workshop" (education-classroom, M, 18); "*I've felt more safe because I actually know what I'm looking for*" (education-classroom, F, 25); "*I don't think I would have been as sensible or as safe a driver as I am now if I didn't have that data*" (telematics, M, 18); "*I think it's helped increase the safety because if I – if say I didn't have it I wouldn't have like any idea*" (telematics, F, 19). This feeling of being a safer driver in turn gave participants a feeling of **boosted confidence** while driving: "*It definitely helped with my confidence in driving and that. Because before I was thinking I was doing something wrong because my grandparents were making it seem like it was easy. Like having all that information readily available – it helped me figure out like, yeah, OK, I'm actually on course. I know what I'm doing now*" (education-classroom, M, 17); "*It has made me more confident, I can say that for sure*" (education-eLearning, M, 19). Some caution may be needed here as over-confidence is not desirable and could create higher risk (see Williams & Ferguson, 2004; Katila et al., 1996; Jones, 1993; Glad, 1988); however, it is important that learner and novice drivers gain enough self-assurance to overcome any initial nerves or feelings of anxiety that could also create risk.

6.2 Benefits specific to individual interventions

This section details the reported positive aspects that were unique to individual interventions. Findings have therefore been separated into separate subsections for the different intervention groups. Note that no themes were found to be unique only to the logbook and mentoring agreements intervention groups or the education-eLearning intervention and so these are not discussed separately below. Common themes associated with the former two interventions, as detailed in the previous section, centred around self-reflection and self-pacing. This might suggest that these two interventions played similar roles in managing an individual's driving experience during the learner and novice stages respectively.

6.2.1 Education-classroom

The education-classroom intervention was given a great deal of praise for elements of delivery. The **course instructor** was praised for creating a welcoming and enjoyable environment while managing to encourage engagement: "*I think the instructor that we had was really good and so he really made it quite fun and things and like just having a range of activities*" (F, 17); "*…he was able to make the environment really warm and welcoming, and we were able to share without kind of judging. It was just a really, really nice environment and I think that's why it was then so much easier for us as a group to kind of bond and to go on and support each other post session, you know, which I think is really important*" (F, 23). This may have been helped by the **size of the groups** involved in the sessions (participants generally reported that there were around four to five people attending a session), which participants felt made it more approachable: "*I liked the small group size… I think it worked very well, because we were all able to talk together. I think with larger groups it's more difficult to get your say into it and it's more difficult to talk, because there's a lot more people*" (F, 22); "*I think because it was a smaller group, it was easier to like listen to what's going on*" (F, 25).

In addition, respondents praised the various **activities** that were used to deliver key messages. This included the VR hazard perception exercise, as it utilised technology to present information to participants in a new way: "*I think it's slightly better to use the headset, because then you feel that you're the one driving, as if you have responsibility a bit, while just seeing it on a screen it's more of a passive approach for me a bit. For me, it was more involved through the headset approach*" (F, 22); "*…it was the VR thing, it just helped me see everything in a much bigger, the actual scale, rather than on a screen where I can't really see properly*" (F, 17) and the puzzle tasks, for getting participants to think about driving exercises in a relatable way: "*…we also did this puzzle piece thing that we had to count down and count up as we were doing it and just putting the puzzle together was easy but when you were counting it's so much harder. It just shows how hard it is to focus on more than one thing at once and so you should just try to limit that if you can*" (M, 17); "*I think we did one of the games that was a good analogy for driving and being distracted, so, they helped*" (M, 17).

The structure of the classroom sessions was also reported to allow for **interaction with other learner drivers**. This was received very well by participants: "*…it was nice talking to other people about driving and how they're going about it and how they're learning and getting advice from them as well*" (F, 22); "*I think it helps you like realise that if you are finding something really easy then obviously other people don't or the other way round*" (F, 17). In particular, interaction was well-received where it was with others at different stages of their learning: "*What I liked about the course was that everyone was at different stages in the driving, so it's quite good to compare where I was with people*" (F, 25). This kind of interaction appeared to raise participants' awareness of the broader learning-to-drive experience and raise their confidence of their own driving as a result.

Taken together, the various elements of the course design appeared to generate engagement with the course content and, through the different learning approach, may have helped with the retention of information. This was something wholly unique to the education-classroom intervention, not present in the specific hazard perception training and logbook interventions. It was also less present in the education-eLearning intervention due to the loss of interaction with other learners and various other interactive elements. The structure of the education-classroom intervention also appeared to allow for **specific messages** around driving behaviour to be presented to participants; specifically, there were messages around speed management techniques: "*…that was one of the things that I came away with – that you go at the speed you're comfortable at. The road speeds aren't a target, it's like a – so again, as a nervous driver, that was something that definitely was comforting*" (F, 23), maintaining a safe distance from other vehicles: "*There were some things I learned that I didn't know about previously… I think it's the second rule where if you're in between two cars and the car behind you is speeding up, you should speed up a little bit to the car in front of you so that if the first car stops you have more time, there's more time for the car behind you to stop*" (F, 22), and stress management techniques: "*I'd say I've learned about quite a few risks… In the sense of learning how to drive. It's just like how to manage stress and how to look out for other road users*" (M, 18).

Note that, in terms of the course content and the impact on their behaviour, participants reported similar themes for the online eLearning format as for the classroom course, and – as discussed earlier – there was positive feedback about the delivery and ease of use of the

online version. However, although the messaging and content was largely similar, as mentioned above, the eLearning delivery did not have the social interaction or two-way communication with the presenter, which was appreciated by the participants that did attend.

6.2.2 Hazard perception training

The content of the hazard perception training intervention was felt by many to be **good extra practice** for the theory test: "*It was better than most of the other ones out there but it was just to get a variation of how different ones worked and different videos and then different things that came up in it*" (M, 21). That is, the training was seen as an extra resource in the pre-existing catalogue of materials on hazard perception skills. In this regard, it was given praise for featuring a range of **different video clips** compared with those regularly featured in other materials: "*…it was good to get a different range of clips to help*" (F, 18). It should be remembered that this group comprised almost all female participants (12, to 2 males), meaning there could be an element of gender bias in the theme's emergence.

6.2.3 Telematics

Unlike the other interventions, telematics was able to provide participants with **direct feedback** on their driving performance across a range of factors. This was found to be useful among the participants interviewed in this intervention group as it encouraged self-reflection on driving behaviours, allowing individuals to recognise their own areas for improvement or areas that they were performing well in. They felt that this in turn helped them to better shape their own practice and improve feelings of driving confidence through positive and constructive feedback: "*I thought it was quite useful. It certainly helps to show how, I suppose, careful in a way, how careful you're driving, how quickly you accelerate and stuff like that, because that can help to make you safer*" (M, 19); "*…it helps you in knowing your driving, how you can improve driving, noticing areas which you need to improve on to be a safer driver. And how to drive more safely on the roads basically*" (F, 19).

7 Findings – barriers / what did not go well

This section presents the things that people reported as being not so positive about the interventions and suggests ways in which these may act as barriers to engagement. The key insights from this were:

- One important reason reported for non-engagement was a lack of awareness of the benefits of the intervention, or a perception that the intervention would not be of benefit.
- The timing of interventions relative to the stage of learning or driving the participant was at also played into whether they saw any point in engaging.
- Some people also reported simply forgetting to engage with the intervention, and a desire for more reminders.
- For some specific interventions:
    - For the education intervention, inconvenience of the location or time commitment for classroom-based sessions was cited as a reason for not attending.
    - For the mentoring agreements, some people noted they had no-one to serve as a mentor. Also, participants tended to report that they would not stick to agreements when these interfered with their social commitments.

7.1 Similarities between interventions

This section details the reported barriers that were shared across different interventions. These barriers fall into three overarching categories: reasons for low initial engagement, negative experience of the intervention, and content. Each of these categories is discussed in the following subsections. It is worth highlighting that no interventions were without some reported barriers, demonstrating that there is room for improvement in their design. Barriers that were unique to only one intervention are detailed in section 7.2.

7.1.1 Reasons for low initial engagement

An apparent barrier to engagement for the participants interviewed was the lack of **awareness** about some interventions, i.e. that many participants did not engage as they did not feel as if they understood what the intervention offered or its benefit to them. The following quotes show examples of participants from the education course, mentoring agreements, and telematics groups not fully understanding what the intervention offered them: "*I don't really know what the course or workshops would have offered me*" (education-classroom, F, 25); "*I didn't realise there was materials, I don't think that was made very clear – actually, it might have been, I might have just missed it or something*" (mentoring agreements, F, 24); "*I didn't really know what it was about. It was probably explained but I just didn't - I was too overwhelmed with driving*" (telematics, F, 19).

Other participants felt that the intervention assigned to them either did not suit them or did not **appeal** to them. This was particularly the case for the mentoring agreements: "*I thought about it, and I thought I don't think this is really going – not going to do this for me, so I*

didn't do anything about it" (mentoring agreements, F, 20); "*I read through the main gist of it, and I just thought that's not really applicable to myself"* (mentoring agreements, M, 18). It was also the case for the telematics and logbook: "*I just don't really use stuff like that, if that makes sense? I don't really - I'm not very techy. I don't really use many apps or anything like that*" (telematics, F, 19); "*I felt like it wasn't really necessary*" (telematics, M, 24); "*I'm a bit disorganised*" (logbook, F, 19). This is an impact of the nature of a randomised control trial, in that participants were assigned to an intervention rather than being able to make the choice and select an intervention that they were particularly interested in or suited their personal preferences: "*I didn't look back at the goals once. So not really. I thought it was an interesting feature, but I knew I wasn't going to be the kind of person to use it*" (education-eLearning, M, 18).

Another barrier was that some participants simply **forgot** to engage: "*I'm being honest, it was genuinely that I forgot. I wanted to do it it's just that I'd forgotten*" (education-classroom, F, 18); "*After my theory test, I guess I just forgot*" (hazard perception training, M, 18); "*At first I used it a fair bit but after a few weeks I've kind of forgotten about it, so I didn't spend too much time using it"* (logbook, F, 19); "*I set a couple for the first sort of three months and then I sort of forgot about it"* (mentoring agreements, F, 18). Multiple participants stated that email reminders or notifications would have improved their engagement with the intervention: "*I think maybe some more reminders for it because I can be forgetful sometimes as well"* (education-eLearning, F, 18); "*Maybe if I had received some reminders maybe I would have continued to do it again*" (hazard perception training, M, 18). Although there were no explicit comments made about forgetting to use the telematics app, it was suggested that if the app automatically recorded data (rather than relying on the participant to connect it before every drive), engagement would have been higher: "*I sort of wished it would start automatically, because when I did go into it, it's quite easy to start but you have to go and remember to turn on the app or at least open the app and use it*" (telematics, M, 18).

7.1.2 Negative experience of intervention

Two of the interventions (logbook and telematics) reportedly had prominent **technical issues** that prevented some participants from fully experiencing the intervention as intended. The logbook was reported to have functionality issues which meant the app crashed regularly, denying participants access to the content: "*Literally within two or three seconds it just kept crashing, and now it doesn't even let me log in and experience it*" (logbook, M, 19); "*I just remember it wasn't working enough for me to have a memorable experience of it*" (logbook, M, 19); "*Every single time I went to load the app it would just crash so I didn't actually get to use it at all which was a bit disappointing*" (logbook, F, 23).

Some participants reported that the telematics app had issues with recording data: "*I tested to see if it would work and it didn't, so I just left it*" (telematics, M, 18); "*I think I stopped using it April, it just stopped recording completely and I haven't used it since then*" (telematics, F, 25); "*I had quite a few problems with it. It wasn't working all the time*" (telematics, F, 19); "*When it got to the end of the week and you got your final score, it would say zero, and amber as if nothing had been logged*" (telematics, F, 25). This was often said to be caused by the Driver2020 telematics app conflicting with other apps that the individual

was using at the same time (e.g. such as one paired with a black box), which could also present different or contradictory feedback: "*I had a black box for my insurance policy and it wouldn't let me connect to the telematics app and my black box at the same time on my phone*" (telematics, M, 18); "*I started off using it quite a bit. Because with my insurance I also had a black box. I also had another app with them. And I found that I was getting different feedback, I think, from the two different apps*" (telematics, F, 22). Additionally, the app featured a voucher system, to reward good driving behaviours. Some participants reported issues claiming rewards: "*…it didn't work a lot of the time*" (telematics, F, 25). These issues highlight the importance of getting the basics right, as these issues were reported as major barriers to engagement for two of the interventions.

7.1.3 Content

The perceived usefulness of the interventions was reported as being dependent on their **timing** in relation to what stage a participant was at in their learning. Many individuals within the education-classroom, education-eLearning, and hazard perception training intervention groups reported that the intervention did not come at a time that was felt to be useful to them, which would be expected to lower engagement. These interventions, that were previously reported as being useful for passing the theory test, were not felt to be as useful among those who had already passed the theory test: "*What I didn't really like is that we did some of the questions covered in the theoretical test. I thought for me that was just a bit redundant; I've already done it*" (education – classroom, F, 22); "*…if I hadn't been at the stage where I was at and I was much earlier, yeah, I possibly think it would have been more useful as a course*" (education – classroom, M, 17). Similarly, there were some participants among those in the hazard perception training group who did not receive the materials until very close to their driving test, so seemingly did not feel much need to engage with the content at such a late stage of their learning: "*I just think after I passed my theory and after I'd done the hazard perception [test], I didn't really need to do it. …it wasn't something I really needed to practise in order to pass the test*" (hazard perception training, F, 19); "*…by the time that the hazard perception modules had been released to me I had passed my hazard perception theory*" (hazard perception training, M, 18).

Participants reported a desire for more information, often stating that additional content (typically that already covered within other interventions or resources, such as that provided by the Driver and Vehicle Licensing Agency (DVLA)) would have improved their use of the Driver2020 interventions, suggesting that eventually an app could be designed that is a **'one stop shop'** for learning to drive. For instance, one participant suggested that the logbook app could be designed to provide relevant theoretical knowledge in response to specific lessons (e.g. highlighting the risks associated with weather conditions): "*So perhaps that's something that could be added in the future... You know like advice for icy roads. You could click on that for the conditions you're driving in."* (logbook, F, 17). Additional information beyond learning to drive, such as managing car ownership aspects like road tax and insurance, were also felt to be desirable: "*I think even talking more about financial sides of having a car, because I feel like people brush over it a lot about the fact that you have to pay for MOT, tax and insurance. I feel like a section on that would be very helpful, just to learn about the things you have to do while you have a car, you can't just drive go and drive*

around you have to do servicing, MOTs, insurance, and everything like that" (education – eLearning, F, 18).

Participants often mentioned that they felt that the interventions **repeated content** that they already knew from general driving knowledge: "*I don't think I learnt any new risks that I didn't already know"* (education-classroom, F, 18); "*I was already quite familiar with a lot of the information*" (education-eLearning, F, 19), or had been provided to them by their driving instructors: "*I've already covered most of the driving theory stuff in this area and so if I needed to know anything else I would have just asked my instructor*" (logbook, M, 18).

Others mentioned that they were using resources other than their Driver2020 intervention to help them achieve a test pass. However, when the resources were compared, the Driver2020 interventions were sometimes thought to be of better quality: "*It was better than most of the other ones out there, but it was just to get a variation of how different ones worked and different videos and then different things that came up in it*" (hazard perception training, M, 21). In other cases, the Driver2020 intervention was felt to present very similar information to a resource participants were already using: "*In my area the local council runs a course…which is basically an online kind of training thing where you can watch videos. You have to identify hazards, and it kind of tests of your memory recall as well because it asks you questions about what was shown in the video. And I thought that covered a lot of the same stuff that was being covered in the session, so once again because I'd already had that previous experience it wasn't new information to me*" (education-classroom, M, 17). There were some instances where other resources were preferred over their Driver2020 equivalents: "*The other one was better because it gave me more information basically*" (telematics, F, 22).

7.2 Barriers specific to individual interventions

This section details the reported barriers that were unique to individual interventions. Like section 6.2, findings have been separated into subsections for the different intervention groups that had such unique themes. No themes unique only to the logbook and telematics intervention groups were found. Common themes associated with these two interventions, as detailed in the previous section, largely centred around the technical issues experienced with these apps and how this negatively impacted on engagement. There were also no unique themes associated with the hazard perception training intervention, as the primary barrier associated with this was around the timing of it, which also applied to the education-classroom intervention.

7.2.1 Education-classroom and eLearning

The primary barrier reported as being associated with the education-classroom intervention was around attending the course. This included where the COVID-19 pandemic caused **cancellations** of the in-person sessions: "*…it got cancelled due to COVID*" (F, 23), although this would not be expected to be an issue outside of the unique circumstances of a pandemic. The online alternative (education-eLearning) was thus created as a solution to allow the classroom-based intervention to continue in an online format, but ultimately there were those who still missed out on the opportunity as a result. There were also those who felt the classroom-based session to be a significant **inconvenience**, and who stated explicitly

that this was a reason for them not attending. This was usually because of where the session was located, this may be far for some people or in a poorly-connected area for someone unable to drive: "*…if the course was offered in a town closer to me that would have helped because the only one available to me was in a town an hour away from me*" (M, 19); "*…the nearest one to me was Milton Keynes and that's a good hour-and-a-half drive and not being able to drive*" (F, 18), or the time it took place, usually during the week where people would have other work or education commitments: "*…it just seems like it was poorly timed. I was still at school at the time, as well so I wouldn't have had the time through the weekday to do it*" (F, 18); "*The issue was I think the closest was London or somewhere like that, and the issue was it on weekdays I saw and it was hard for me to finish work and go because the workshop would end by 4pm, I think, and I finish work at 5:30 so I would have to take the entire day off*" (F, 25).

The education-eLearning course that was offered as an alternative to the in-person classroom session was also criticised for the perceived **time requirement** required to complete it (despite it possibly requiring less time overall than the classroom course, which was six hours plus travel): "*…the reason I didn't complete it was just because I found the - it was just taking up a lot of time and I didn't feel like I was getting enough out of it for the time I was putting in*" (F, 18). This led to a number of individuals opting not to complete the full course, particularly where it was felt not to be providing any benefit. This would suggest the trade-off that must be considered between the in-person classroom education and its online alternative. The in-person sessions were felt to be more inconvenient because of the associated travel commitments that were required, but this seemed to pay off with a greater level of engagement with the content and interaction with other learner drivers (see section 6.2.1). On the other hand, the education-eLearning completely removed any travel commitments but removed a substantial level of interactivity and thus seemingly lessened feelings of engagement: *"the virtual aspect does take away from a lot of the way it's experienced … in person you'd actually get advice on what to write and you'd get to hear what other people have written"* (M, 19).

7.2.2 Mentoring agreements

Some participants within the mentoring agreements intervention group faced the unique barrier of having **nobody to mentor them**. For instance, some individuals reported that their parents or guardians showed no interest or willingness to take on this role in supporting their learning experience: "*I don't think my family, or my partner would be up for that kind of thing. So, I didn't look into it any further than that. So, I didn't partake in anything like that*" (F, 20); "*…my parents just sort of said as long as you're safe, you're driving OK then that's fine. So, I don't think they felt the need to restrict my miles or monitor how much I'm driving based on the fact that you can do any amount of driving as long as you're being safe*" (M, 18). Without someone there to 'enforce' the agreements, participants reporting feeling no reason to engage with the intervention. Alternatively, if an individual sought to manage their own agreements using the 'proxy mentor' self-assessment option that was available on the website, the lack of an actual mentor generally meant they were less strict with following any self-set restrictions: *"I was doing it with myself, so there was no one really to enforce it. I did try, but sometimes if a friend wanted a lift after a party or something, I'd give them a lift... I wouldn't say I excessively broke it, but equally, it was more of a guideline*

rather than a rule" (F,19). In short, self-managed driving agreements were seemingly less effective for these participants than those managed by a secondary person in the mentor role.

The mentoring agreements appeared to have, in some cases, a negative impact on the culture of being a young new driver. Specifically, participants noted **not sticking to agreements** where it conflicted with their social needs, such as giving lifts to friends or driving at night: "*I was doing it with myself, so there was no one really to enforce it. I did try, but sometimes if a friend wanted a lift after a party or something, I'd give them a lift*" (F, 19); "*I found it quite difficult to stick to no passengers at night, I think that was the most difficult agreement to stick to because I think when you pass your test like at my age obviously I was 18 when I passed, so it was quite common for people my age if they could drive to drive during the night. And to see other people, and go places. That's very appealing to my generation is driving at night, people like to do it*" (F, 19). This is important as the mentoring agreements are intended to restrict driving in these high-risk conditions during the early stages of independent driving. As the mentoring agreements are a voluntary intervention, they are likely to be more effective if a parent or guardian actively enforces the agreed driving restrictions. This would likely rely on a mentor who understands the benefit of having these restrictions and actively invests time into their mentee's learning.

8 Discussion with delivery partners

In addition to the interviews with learners and novices, discussions were held with each of the delivery partners to understand their experience of delivering the interventions and to get their opinion on future roll-out including different mandatory/voluntary scenarios. At the beginning of the discussion, delivery partners were asked to imagine that the trial had been a pilot for their new intervention, and the main question for them to consider was what they would do as a result of the pilot. Interviewers also communicated that the discussion was not about the overall Driver2020 project, except for a brief discussion of the impact of COVID-19.

The topic guide used for these discussions is included in Appendix D. This section summarises the key themes, including similarities and differences between the interventions. Note that all discussion in this section is the opinion of the individuals representing the delivery partners only. While useful for supplementing the participant interviews in learning lessons that may help with future delivery, these discussion outputs were not subject to structured analysis. The reason for this is that the data came only from conversations with individuals or very small teams who naturally had a specific set of views on the interventions for which they were responsible; it was not felt that such conversations could provide as rich a dataset in terms of what end users experience when they engage (or not) with the interventions. In each case, one or two people were identified by the delivery partner as being the most appropriate to discuss delivery. Although all key individuals for each delivery partner were therefore included in the discussion, it is possible that others involved in the delivery of each intervention may have had different views. Discussions took around one hour; the number of people and roles for each partner are summarised in Table 3.

Table 3: Summary of people involved in delivery partner discussions

Intervention	Delivery partner	Number of people and roles
Logbook	Driving Instructors Association	Person 1: Strategic lead for delivery of intervention; helped in design, implementation into app, and oversaw delivery Person 2: Project Manager (PM) for day to day running of intervention and data sharing
Hazard perception training	DriverMetrics	Person 1: Led design of the intervention working with Academic Advisor, PM for system implementation and data sharing
Education	Agilysis	Person 1: Involved in design, PM for delivery phase and subsequent online translation Person 2: Lead for classroom delivery, and heavily involved in the online translation.
Mentoring agreements	RoSPA	Person 1: Heavily involved in design and creation of materials, and then PM for delivery and data sharing

Intervention	Delivery partner	Number of people and roles
Telematics	TrakGlobal	Person 1: Heavily involved in translating intervention from supplier's commercial offer to the project implementation of the app; oversaw team delivering intervention and led data sharing

The key insights from the delivery partner discussions were as follows:

- Regarding the design of the interventions and the match between the delivery partners' descriptions of how they work, and the logic models:
    - For the mentoring agreements, telematics, hazard perception training and education interventions, there was a good match.
    - For the logbook intervention, the description of how the intervention worked from the delivery partner was not a perfect match to the logic model. However, the logic model informed the development of the app, and therefore the fidelity of delivery should be assumed as being good.
- All partners noted concerns regarding how COVID-19 impacted on both learning to drive, and in some ways with engagement with their interventions.
- Regarding engagement with the interventions, delivery partners noted that:
    - Engagement was low, as was expected in a voluntary context – engagement was the main challenge faced with delivery.
    - There was a need to get the right balance between incentives and penalties where an intervention was being implemented in a voluntary context.
    - There were difficulties with two stages of engagement – both initial signup to the intervention and retention; broadly retention was the bigger challenge, but it varied across different interventions.
    - Increased and regular communications with participants could encourage engagement but needs to be balanced with effort required to implement.
- Involvement of others – notably parents/mentors, ADIs and schools – was reported as being critical for the successful delivery of most of the interventions.
- Regarding accessibility of the interventions, delivery partners noted that:
    - There are technology factors that impact on accessibility (smartphone, internet, car).
    - There are individual factors that impact on accessibility (language).
    - The interventions may not be as well-suited to older novice drivers.
- Improvements suggested by the delivery partners for individual interventions were:
    - Logbook intervention
        - Move to learning goals rather than time-based milestones.

        - More recaps to celebrate achievements.
        - More use of video content and interactive engagement.
    - Hazard perception training intervention
        - More clips and ensure that clips are tailored for location.
        - Restructure to deliver all modules before participants take their practical test.
    - Education intervention
        - Changes to language used when lower numbers attend – for example framing interactive content around 'others who have attended'.
        - Longer amounts of time on 'when to drive' and 'goal setting', and a physical or electronic workbook to take away.
        - Hybrid model (online and classroom based).
        - Keeping content up to date.
    - Mentoring agreements intervention
        - Making messaging more positive, although still needing to include nighttime driving restrictions in the agreements.
    - Telematics intervention
        - Adapting content in future to allow use of wearable technologies.
- Regarding potential roll-out options, the delivery partners noted that:
    - A voluntary roll-out as tested in the trial would require careful attention to be paid to incentives.
    - A mandatory roll-out would be very difficult, and in some cases (for example telematics) would need careful integration with existing products.
    - One useful approach to incentives for most interventions would be through insurance. Charging for the education course was noted as a specific potential tactic to improve engagement.

8.1 Design of interventions

At the start of the discussion each delivery partner involved (see Table 3 for individuals/groups involved) was asked to summarise, in their own words, what their intervention was designed to do and how it would be expected to improve safety in novice drivers. The aim of this was to assess alignment of the delivery partner's assumptions with the original design concepts, which was important for the assessment of delivery fidelity (the match between intended delivery and actual delivery).

Logbook

The aim reported was to help learners reflect on their learning process and also to learn more 'consciously'. The intention was to emphasise that driving lessons with an Approved

Driving Instructor (ADI) should not be the only means of learning and that time and energy should be invested into private practice and reflection. The logbook app was designed to both encourage and track this practice and reflection on lessons learned.

While this description was aligned broadly with the intervention's purpose, the feedback from the delivery partners lacked a detailed description of the 'active ingredient' in the intervention based on the evidence reviewed during the design stage – namely that the intervention was designed to increase the amount and breadth of on-road practice obtained before passing the driving test.

Hazard perception training

This intervention was reported as being aimed at improving hazard perception skill through providing drivers (through online modules) exposure to new scenarios that they may not have encountered in real life. The intention was to broaden drivers' expertise and to encourage them to think about scenarios in a more mature way (i.e. from the perspective of a driver with much more on-road experience). It is important that this is not given all at once and that each element is built upon regularly; the training was therefore designed to get more complicated (via more challenging scenario video clips) as participants progressed through it. The intervention was designed to increase awareness without creating overconfidence.

This description was aligned with the core evidence-based purpose of this intervention – namely the increase in hazard perception skill before passing the driving test.

Education

The aim of the education course (both face-to-face and online) was reported as being to get participants to understand that driving is not easy and to help them to think about the complicated processes that are involved. The course covered motivations, limiting exposure to higher risk activities, awareness of risk factors, increasing hazard perception skills, and increasing on-road practice. It also covered the need for taking responsibility and making good decisions after test pass – e.g. self-imposed mitigations, self-management and other options for addressing the known risk factors. It was reported as being known that participants tend to prefer learning skills to behaviours, so it was therefore seen as important to frame the content so that attendees saw value in what they were learning.

The reported description covered the breadth of topics this intervention was designed to address.

Mentoring agreements

The reported intention of this intervention was to provide drivers and mentors with information (via a website) about the key risks to novice drivers and give them the materials to set up mentor-driver agreements. The agreements were to be aimed at gaining experience of different driving situations in a gradual and structured way and delaying exposure to the riskier situations, e.g. driving with peer-age passengers and at night. It also considered exceptions, for example drivers who needed independence to drive at night for work. The intervention was based on literature and resembles a voluntary version of the Graduated Driving Licensing used in some other countries.

This description was a good match to the evidence-based purpose of this intervention, namely, to implement a kind of 'voluntary graduated licensing' focused on the higher risk driving situations post-test (especially driving at night and while carrying peer-age passengers).

Telematics

The aim of this intervention was reported as being to influence participants to drive more safely through feedback on their driving delivered via an app. It also provided incentives in the form of rewards for safer driving and removal of rewards for less safe driving (with these categories being defined through readily available data on driving behaviour and exposure variables). The delivery partner observed that there is a fairly well-understood connection between feedback and incentives and changing behaviour; however, whether it is effective when there is no true penalty or jeopardy is less clear.

The description provided matched well with the purpose of the intervention, being about rewarding good driving, and punishing poor driving using a variety of mechanisms.

Summary

The intervention delivery was described by delivery partners broadly as intended. This was true for all interventions, even those where the 'mental model' of the delivery partners was not a perfect match for the logic model underpinning the intervention. The logbook in particular had a more complex logic model than was apparent in the delivery partner's description, however given that it was a smartphone app with automated communications, this ensured delivery fidelity. This issue needs to be carefully managed in any roll-out, as it was during the trial. Note the logic models for all interventions are available for reference in the supplementary appendix document for the project (Weekley & Helman, 2024).

8.2 Impact of COVID-19

The only intervention that was affected in terms of delivery was the education course. This had previously been an in-person one-day course with a trainer and was redesigned as an online module-based course.

All delivery partners assumed that the pandemic would have had an impact on the amount of driving that participants were able to do and therefore also an impact on their engagement with the associated interventions – this was particularly true for telematics, logbook, and the mentoring agreements where driving exposure is necessary for interaction with the intervention.

It was reported that the impact continued after driving restarted. For example, delivery partners suggested that there was increased concern about being able to book lessons and tests and thatthis may have led to reduced enthusiasm for learning to drive and possibly even to learners giving up altogether. For the mentoring agreements it was also suggested by partners that, after a long break from driving, participants may not be interested any more or may have forgotten about the intervention.

For the online hazard perception training, the cancellation of theory and practical tests meant that all participants in this group who had not passed their test at the time of the lockdown were unable to progress through the modules. It was suggested by the delivery

partner that the pandemic may have caused a loss of momentum and enthusiasm leading to higher dropout levels than may have been seen without the pandemic.

8.3 Engagement

For all interventions, the delivery partners said they expected low engagement levels; all except the partner discussing the telematics intervention reported that actual engagement was even lower than those expectations. Engagement was reported as the main challenge faced during delivery – not only getting participants to sign up with an intervention but keeping them engaged. As discussed above, all delivery partners believed that there had been a negative impact on engagement from the pandemic, but that low engagement was also to do with the interventions themselves, and the voluntary model adopted.

For the mentoring agreements, participants did not receive any incentive – except the possibility of safer driving – but if they signed up to an agreement and kept it, they did implement restrictions on their driving. It was suggested by the delivery partner that this could easily be viewed by participants as receiving a penalty with no incentives in return and may explain why many signed up to the intervention but did not do anything. Similar interventions have been used in the US (see Pressley et al., 2016, for a review of these), and it was discussed by the delivery partner that this may demonstrate the different challenges associated with a different culture; they suggested that in the US the relevant drivers are often younger (from age 15 in some states) and are often using their parents' car, whereas in the UK new drivers are age 17 and over, and also may be more likely to be driving their own car. It was suggested that this may reduce the control that the mentor has and the amount of 'jeopardy' that the new driver feels is associated with not engaging. Related to this, the mentoring agreement delivery partner noted that many participants did not involve a parent or a mentor, choosing to use the 'proxy mentor' self-assessment route instead. The delivery partner suggested that though this choice may imply a level of self-motivation, it may also imply a greater belief that involvement of a parent or mentor is not relevant, than is the case in the US.

The telematics intervention had the most explicit incentives – small 'treat' rewards (e.g. coffee vouchers) for safer driving, and protection of entries to a monthly prize draw for avoiding risky driving behaviours; it also had the highest levels of engagement of the five interventions in this trial. However, compared with similar interventions used in the insurance industry, the engagement level – in terms of keeping participants engaged – was reported as being much lower. It was suggested by the delivery partner that this was due to the lack of 'jeopardy'; in an insurance-based programme, the threat of having their insurance removed appears to act as a powerful motivator for those involved. Of the Driver2020 participants in this group who used the app, less than 50% maintained a positive score, and about 25% would have been in danger of having insurance removed in a normal insurance-based programme. This is a similar profile to insurance-based programmes even though it might be assumed that the types of drivers who would volunteer to be part of Driver2020 would maintain higher scores. Conversely, 99% of treats earned were claimed (which requires active interaction with the app), compared with approximately 40% in the insurance-based programmes; it was suggested by the delivery partner that this may illustrate that the motivation these participants had was entirely due to incentives.

This need for tangible incentives was also highlighted by the delivery partner for the logbook intervention. In the existing app, motivational messaging was used – e.g. receiving praise for completing a certain number of hours driving or in a variety of environments. It was suggested that this was insufficient, and that higher engagement would be achieved with tangible incentives, perhaps through collaboration with relevant brands attractive to the target age group and / or incentives linked to reducing insurance premiums as more experience is logged.

Neither of the interviews for the hazard perception training nor the education course provided any further insight into the balance of explicit incentives and penalties. Neither had tangible incentives for participation nor imposed any restrictions.

For the hazard perception training, the delivery partner expected higher engagement than was observed with the first module, given its proximity in time to the theory test. They expected the lower engagement seen in later modules.

Conversely, initial signup for the telematics and logbook interventions was reported by delivery partners as being relatively high. However, there was a large reduction from the numbers that initially signed up to the interventions to those that actually engaged. In both, it was noted by delivery partners that a small number of people engaged a great deal but generally there was a significant drop-off. For telematics it was suggested that 17-24-year-olds tend to require either "*hand-holding*" – greater and more regular encouragement – or a bigger incentive to overcome the reduction in motivation; one delivery partner suggested that *"life seems to get in the way"* of continued engagement.

For the education course in the classroom setting, where engagement was largely binary (attending or not) "*no shows*" were mentioned as the biggest problem related to engagement; the delivery partner reported that many would book onto a course but not attend. For the online version, again it was reported that many started but did not finish; however, since gaps between modules were encouraged, the dropout was expected. For both delivery mechanisms it was believed to be a fairly standard dropout rate for this age group. There were reports from the delivery partner of participants requesting face to face courses closer to their home and at different times, although a course run at the weekend in response to these requests did not achieve higher turnout.

For mentoring agreements, the challenges with engagement were reported as being spread more evenly through the stages. The delivery partner reported that some participants signed up and did nothing, with others followed the 'recommended route' all the way through. Some stopped after doing one or two agreements, but it was not clear if this was due to loss of interest or because of COVID-19. The delivery partner noted that some participants went straight for the third agreement, which allows two passengers and driving up to midnight, and suggested that this was perhaps due to a desire to minimise perceived restrictions.

The main challenge mentioned by all delivery partners was getting the level of communications right. All delivery partners did some kind of chasing or nudging of participants during delivery in order to encourage greater engagement. Most said they increased or refined this during the trial, either by automating reminders, increasing the number or frequency or adding a delivery method (e.g. texts as well as emails). Most

partners explicitly said that they would increase the level of this activity in any future rollout, for example by phoning participants as is often done for insurance provision. It is noteworthy that participants also mentioned the need for more reminders to engage with interventions (see Weekley et al., 2024a, 2024b).

For those participants that engaged with interventions, delivery partners said that they seemed to work as planned; all delivery partners reported very low levels of support requested via helplines or elsewhere. In terms of future rollout, the telematics intervention delivery partner observed that the often high engagers are also the ones that can cause the most burden for customer service management, as they may question small changes in score. In the trial, these participants were the minority, but it was suggested by the partner that this would be an issue for rolling out more widely. The delivery partner reported that, from their experience with other similar programmes, there is a balance between providing too much information and not enough. Scores such as those used in the telematics intervention need to have enough detail to make them credible, but not so much detail that users are able to question very small changes; as such, questions can create increased customer service requirements. They discussed that it is necessary to set expectations at the start about the level of detail that is provided and the user's level of recourse, as both will depend on the jeopardy inherent in the intervention, i.e. what the user stands to lose if something is incorrect.

8.4 Delivery

Delivery partner interviews emphasised the reported importance of the involvement of third parties in the delivery and use of most of the intervention. For mentoring agreements, the need for mentor involvement was a fundamental part of the intervention. For the logbook intervention, hazard perception training and the education courses, parents, ADIs and schools were all identified by delivery partners as being critical to success.

For the logbook, engagement with parents and ADIs was part of the design of the intervention. However, the delivery partner reported that parents rarely engaged, although when they did, they engaged well. It was also mentioned that there was extremely limited engagement from ADIs though this was potentially related in part to the impact of COVID-19. It was felt by the delivery partner that greater integration with parents and ADIs would be needed in the future, possibly through improved onboarding – partly to add a bit of discipline and also to lessen the requirements on pupils.

Neither the education course nor the hazard perception training explicitly designed third party involvement into the interventions, however, both delivery partners identified and reported the value it could bring. For the face-to-face education courses, the delivery partner noted that most participants had been told to attend by their parents, although a few did attend on their own motivation. It was reported by the delivery partner that many of these participants did not know what the experience was going to involve and that this was addressed by helping participants to think about what they would be able to get from it and what their motivations might be. It was less obvious to the delivery partner how large a role parents had played in engagement with the online version. In a wider rollout, the delivery partner suggested there would be value in reaching participants through schools,

although both schools and parents may have a reducing influence as the age of new drivers increases.

For hazard perception training, the delivery partner identified that a real-life 'nudge' would be helpful for engagement, even though the intervention is entirely online. It was suggested that either schools or ADIs – or ideally both – could fill this role. It was reported that similar schemes that have used a school-based session to introduce the programme have been very effective, and peer-to-peer conversations are also extremely important. However, the delivery partner noted that the schools-based approach alone would be disconnected from the actual learning-to-drive process, and would even be delivered to those not actively learning to drive. Ideally, this approach would be followed by linking with driving lessons – for example ADIs could be aware of the clips that participants are shown in the hazard perception training and integrate this into the learning-to-drive process.

8.5 Accessibility and hard-to-reach groups

When considering accessibility and hard-to-reach groups, similar issues were raised by delivery partners across all the interventions, though to varying extents. In summary these were:

Access to smartphones: use of a smartphone was reported as the best delivery mechanism for both the telematics intervention and the logbook intervention. It was suggested that the latter could be converted into other formats, but would probably be less convenient and user-friendly.

Access to the internet and computer literacy: as well as the two apps mentioned above, the mentoring agreements intervention, the online education course and the hazard perception training all required access to the internet and basic computer literacy. It was identified by partners that the hazard perception training – and potentially others – could be linked with driver number and then made accessible through public access (e.g. libraries) or through third parties (e.g. ADIs) but again, this would be a less user-friendly and convenient process.

Language / general literacy: more generally, all interventions have, to varying degrees, written instructions and information. Therefore, it was noted that translation into other languages would be necessary if rolled out across devolved nations and basic literacy would be required.

'Older novice drivers': The interventions are designed specifically for the 17-24 age range targeted and therefore may be less impactful for older learners. This was explicitly mentioned by the delivery partners for both the mentoring agreements and hazard perception training.

Access to a car: although obvious, both the mentoring agreements and telematics intervention require access to a private car for use (although potentially the information provided on the mentoring agreements website could still be useful to those without access to a private car). This also impacts the extent of use for engagement with the learner logbook intervention. No access to a private car means delayed solo driving and lower risk of collisions, however delivery partners noted the importance of considering how the interventions could be delivered when the first months of driving may not be immediately following the practical test pass.

8.6 All delivery partners agreed however that accessibility of the interventions is as good as might reasonably be considered practical within the trial. Improvements

All delivery partners identified improvements they would make to the content and design of the interventions following the experiences in the trial. Broadly, these modifications are aimed at increasing engagement through the lessons learned. However, since details are specific to the individual interventions, these are summarised individually in Table 4.

Table 4: Suggested improvements to the interventions

Intervention	Suggested changes and modifications from partners
Logbook	• Delivery partner would move away from using time-based milestones (i.e. number of hours) to working towards learning goals in specific risk areas whilst in the supervised environment of learning – for example an 'after dark' badge. • In terms of encouragement, they would include more celebration of achievements – recapping what the participant has learnt and the benefit gained. • The delivery partner would also consider the use of video content and interactive engagement.
Hazard perception training	• The delivery partner would keep the content format the same but add more randomised clips. Since it is intended to be a tool for broadening experience, they would also consider using tailored clips based on a driver's location and the road types they are most unfamiliar with – for example showing clips with tractors on rural roads for those in urban areas. • In terms of the structure, having three modules was reported by the delivery partner as the right number (with the level of difficulty increasing at each stage) but they would change when they happen. The value of a post-test module is appreciated but there was a big drop in engagement at that point – engagement is key and hence they would suggest moving all three components to be pre-test; this would likely keep one at the theory test stage and one triggered when the practical test is booked, with another at some point between the two.
Education course	• As the design of the session was based on larger numbers, several adjustments were made during delivery of the face-to-face course to adapt to the low numbers of engagers whilst not changing course content. For example, as fewer peer-to-peer learnings were possible in smaller groups, the facilitator used language like 'other people who have attended have said this….' to avoid the impression of lecturing. • The delivery partner would also make some amendments to the lengths of sections, for example, spending more time on topics such as when to drive or having a longer introduction and goal setting at the start. Having a physical workbook to take away was reported by

Intervention	Suggested changes and modifications from partners
	participants as very helpful, hence a downloadable one was included in the design of the online version. • Online was the option preferred by the delivery partner – participants being able to go at their own pace was seen as useful and it is by definition interactive – however the lack of face-to-face and peer learning was lost. • A potential option also suggested by the partner was a hybrid model – using online material, but with an introductory face-to-face session (likely through schools) where some modules are worked through together. • Content-wise, the delivery partner noted that the material would need to be updated to be kept current. They would include more physical/visual exercises and (if possible) include mentoring agreements and more on hazard prediction and critically assessing the road condition / situation.
Mentoring agreements	• The delivery partner would keep the intervention online but consider if there was a different way of framing the information so that the agreements are viewed less as restrictions – making it more attractive to young people and getting increased buy-in. • Pre-trial there had been concerns about whether participants could adhere to the night-time driving restriction, but the partner did believe this needs to be a focus.
Telematics	• There were no immediate modifications that the delivery partner would make but there was an acknowledgement that it is an ongoing challenge to get the visual presentation correct and this is constantly changing due to new technologies. For example, the next stage may be to adapt to the use of wearable technology.

8.7 Rollout scenarios

When discussing how each intervention could be rolled out in the future, delivery partners were asked to consider three different scenarios for their intervention:

- A wider rollout of the trial scenario – i.e. voluntary with minimal incentives
- Making the intervention mandatory for all learners/novices
- Rollout in a voluntary context but with different (and greater) incentives.

A summarised opinion from each partner for their intervention and scenario is shown in Table 5 below; each scenario is discussed in turn in the following subsections. Note that these responses are concerned only with engagement with and delivery of interventions, rather than the effectiveness of the interventions.

Table 5: Summarised opinions from delivery partners of rollout scenarios by intervention

	Voluntary as trialled	Mandatory	Voluntary with different incentives
Logbook	'This would not work without greater incentives.'	'This should be mandatory but bringing in new legislation is very difficult.'	'This would need to be led by the insurance industry.'
Hazard perception training	'This would not work without greater incentives.'	'This should be mandatory and could be, but there are still some issues.'	'Better incentives would be needed – insurance industry could be important.'
Education course	'This would only work for a small (self-selecting) subset of learners.'	'There are some issues with accessibility and enforcement.'	'Better incentives would be useful. Charging for the intervention may help engagement.'
Mentoring agreements	'There is not enough appetite from novice drivers for this to work.'	'The need for legislation makes it difficult.'	'This could work with the right incentives – the insurance industry could be important.'
Telematics	'This would not work without greater incentives.'	'This could cause confusion with insurance products.'	'This could work with a Government-led initiative, fully integrated with insurance industry.'

8.7.1 Voluntary – minimal incentives (as trialled)

All partners felt that rolling their intervention out in a voluntary context with minimal incentives -– i.e. the same or similar to that used in the trial – would not be viable. The reason given for this was the level of engagement was as low as, or lower than, expected (as discussed in detail above). Most suggested this was because drivers need to see a benefit for themselves – improved safety is not usually seen as a benefit as many young drivers are overconfident in their own abilities to remain safe, and do not see themselves as a risk. As discussed above, it was also mentioned that as well as perceived benefits, there need to be negative consequences for failing to engage. Delivery partners reported that without additional measures to increase engagement, it is difficult to see how the interventions could be rolled out.

It was also mentioned that, in this scenario, engagement with interventions would be appealing, and accessible, to only a fairly similar self-selecting group of young drivers, generally those who are already conscientious and probably with a strong parental influence.

8.7.2 Mandatory

Most of the delivery partners agreed that rolling out the interventions in a mandatory context would not work but for somewhat different reasons depending on the intervention. For both the mentoring agreements and the logbook, it was agreed by the delivery partners that, although in their view they *should* be mandatory, this would not be possible because of the difficulty of implementing new legislation. For the mentoring agreements it was pointed out that a mandatory rollout would effectively be a form of graduated driver licensing. For the logbook, it was felt that this, or similar, would need to be mandatory for it to have any kind of effect; there was a perception from the partners that a lot of time has previously been spent on voluntary road safety initiatives that do not have the size of effect needed.

A practical issue was raised in relation to mandating the telematics intervention – doing so would necessitate mandating the use of a government mobile phone app which could cause confusion with any insurance-based app. The delivery partner raised that running two apps at the same time would require increased battery usage and any differences between the two would reduce the credibility of both and likely lower compliance.

For mandating the education course, the issues raised by the partner were less substantial and were focused on the difficulties of accessibility and enforcement; it was suggested that some kind of test would potentially be required to ensure learners engaged properly with the material.

The hazard perception training was the only intervention where the delivery partner thought that it could be possible to roll out in a mandatory context, although issues were still identified. It was felt that the training is critical in addressing the shortfall that results from lessons not being able to provide the full range of scenarios – it is difficult for instructors to cover all situations, and the associated different skills, without a tool such as this. The delivery partner suggested that, ideally, learners would be required to have a longer learning time which encompassed different seasons, weather and lighting conditions, road types etc, but felt that mandating hazard perception training would be a small step towards this. One reason why the delivery partner thought the intervention had potential for being mandatory is that it is scalable – it was pointed out that there are few technical issues associated with rolling it out on a very large scale. However, it was raised that there would need to be decisions made on how this would fit with the current hazard perception test – e.g. would there be pass/fail criteria, would repeats be allowed, what would be the mechanism for triggering the training and enforcement etc.

8.7.3 Voluntary – different incentives

All delivery partners mentioned that involvement from the insurance industry would be relevant to successfully delivering the interventions in a voluntary context albeit to different extents – for the telematics intervention and the logbook intervention it was considered absolutely critical, whereas for the others it was considered merely useful.

Both for hazard perception training and the mentoring agreements, the delivery partners discussed the need for stronger incentives for participation and suggested that a link with insurance would potentially be the most appealing option. It was mentioned however that

insurance companies would need to see a benefit and there would be nothing stopping other companies undercutting those who had committed to providing discounts. Both delivery partners were doubtful that other types of incentives could work, and suggested that there would need to be some kind of research to establish attractive incentive options for the age group. They discussed that there also remains the issue that there would still likely be a self-selecting group of drivers who would sign up, or be able to sign up, to such interventions; a voluntary approach may not reach the riskiest groups.

For the mentoring agreements, the delivery partner thought they could be made to appear more mandatory through schools and parents, but this would still not ensure participation or engagement. However, if either mentoring agreements or hazard perception training were rolled out voluntarily, they said that marketing towards and engaging with parents and schools would be very important, as discussed previously, and the problem of reaching older novice drivers would also remain.

Delivery partners suggested it could be useful to aim to make interventions 'mandatory by proxy' through linking with insurance, supported by instructors, schools and parents. For the logbook intervention, as mentioned above, the involvement of the insurance industry was considered even more important – primarily from a practical point of view. It was suggested by the delivery partner that, since changing legislation would be difficult, letting the implementation fall to the insurance industry could result in it being effectively 'mandatory by proxy' (i.e. that it would become virtually impossible to get a young driver insurance policy that does not include these elements) and that this could happen in a far shorter timeframe than might be expected through legislation.

The delivery partner for the education course was the only one to suggest that incentives related to insurance may not be the best option, raising the point that insurance discounts can be considered very distant to those to who have only just started learning. They did discuss that incentives could be useful, but that those that could immediately be enjoyed may be more effective. Again, the involvement of schools, parents and driving instructors was considered by this delivery partner to be extremely important in a voluntary rollout.

The main suggestion that was made for rollout of the education course however was that participants should be charged for it and pay in advance. From the delivery partner's experience, charging increases engagement (specifically retention) as an investment has been made upfront and the participant then wants to get value from the activity and pays more attention.

It was discussed by the delivery partner that the cost would not need to be large as the gesture is largely symbolic, but that attaching any kind of monetary value could make the course even less accessible to hard-to-reach groups. They suggested that options to address this could include some kind of means testing or even refunding those who do attend, since the primary motivation is to increase retention and stop no-shows.

It was observed by the delivery partner that older participants in the group interaction element of the (classroom version) education course often added depth to discussions; the different viewpoints they offered were reported as really helping to increase the impact of the learning. The partner therefore also thought there could be value in rolling the

intervention out more widely than just to young learners, to incorporate some older age groups of learners.

For telematics, it was suggested by the delivery partner that there may be value in the Government having an active role in a voluntary scheme, through official backing of a telematics algorithm recognised by insurers. The telematics intervention has the closest links to the insurance industry as similar technology is already widely used and associated with policy discounts. For this intervention to be rolled out voluntarily the delivery partner felt that it would need to be high value and have material consequences (both good and bad). An option they suggested was an insurance-led but Government-backed scheme where scores are transferable between insurers. Currently, a driver's score from one telematics-based insurer is not relevant to a new one; the only information taken into account is they have made any claims. The delivery partner suggested that if enough insurers recognised one Government-approved scoring system or algorithm then the score would be portable and would provide far more useful criteria for risk than number of claims. In this scenario, drivers would be given a chance to reduce future premiums by potentially a substantial amount, based on a (transferable) high driving score. The delivery partner reported that this scenario has been considered already by price comparison websites; however, in their opinion, involvement of Government could reduce costs for insurers and make it valuable enough for them to be involved.

The delivery partner also discussed that there would be the need for further consideration and development of the underlying algorithm. They reported that insurers currently target young drivers when developing such policies as premiums are sufficiently high to make the development and technology worthwhile; the schemes have to be running for a while to get a return on investment so the challenge for insurers would be losing profitable customers due to increased transferability. The delivery partner felt that having one single algorithm for everyone would create challenges regarding ensuring fairness for all users; for example, driving at night is riskier but may not be something that a driver can avoid.

They thought that it may be possible to have a generic shared algorithm in addition to company-specific ones; elements such as smoothness, harsh braking and harsh cornering tend to be fairly standard. It was reported that most algorithms from different companies are broadly similar so it would be rare to have extremely different scores with different ones.

In either case, the delivery partner mentioned that insurers would need to share claims data and scores so that the algorithm could be constantly validated. The key requirement would be to ensure that any scheme had a clear benefit of involvement for both drivers and insurers but it is believed that it could be practicable.

All delivery partners considered that, due to the difficulties with mandatory rollout, the likely approach would need to be interventions being voluntary but with sufficiently significant incentives (probably through insurance) and support from driving instructors and schools/parents that engagement becomes standard.

9 Discussion

The Driver2020 project used a randomised encouragement design to evaluate the real-world effectiveness and efficacy of five interventions designed to increase the safety of drivers in their first year of driving. It also assessed the delivery of the interventions with a focus on those factors that helped or hindered engagement.

The findings presented in this report sit alongside those from the effectiveness reports from the novice and learner arms of the study (Weekley et al., 2024a; Weekley et al., 2024b). Those reports showed that when the interventions were offered on a voluntary basis and with modest incentives, they had very low engagement levels. The way in which the level of engagement was measured depended on the intervention; in all cases however, even when using very modest criteria to define that someone was deemed to have 'engaged', only between 3% and 16% of people fell into this category (see Weekley et al., 2024a; Weekley et al., 2024b for full details of engagement levels).

This feature of the interventions, their low engagement levels, lends great importance to the findings presented in this report. Put simply, voluntary engagement with these road safety interventions was poor in learner and novice drivers, and the findings in the current report serve as a starting point for understanding how engagement levels can be improved. In the absence of mandatory delivery, even good interventions will fail to have a material impact on collisions and injuries in this group without high levels of engagement.

Based on the feedback from learners and novice drivers who were offered the interventions in the Driver2020 project (and the opinions of those organisations delivering them), the following conclusions are drawn.

9.1 Learning to drive and driving were seen as challenging, but important

The learner drivers interviewed in this study said they found learning to drive challenging. Acquiring driving as a skill was itself seen as challenging, characterised by worry about complex road situations such as roundabouts and driving involving higher speeds, and specific situations that are focused on in the test, such as reversing and parking. Learners interviewed also had a very clear insight into how difficult almost everything was at the beginning of their learning when they knew almost nothing, and every situation involved something new.

Learners interviewed also anticipated that the things they were **learning would not prepare them completely for the driving they would need to do after they passed their test**. Novices interviewed reported that this fear was fully founded; they mentioned the stresses brought on by other road users, and the clear disconnect between what is expected pre-test and what is expected in ‘real driving’.

Wrapped around the challenges associated with the task of driving were practical difficulties in the process. **Learning was reported by participants as being expensive and effortful, and the support of family and friends, both financially and in terms of wider support, was reported as critical**. The sample of participants in the current project had the additional challenge of the COVID-19 pandemic, which led to much greater complexity in the process due to cancelled tests, lessons and subsequent delays caused by backlogs.

Despite all this, for those who embarked on learning to drive, the result was seen as being valuable. **Driving was seen by the participants in this study as an important life skill that is transferable and provides flexibility and freedom of mobility**.

9.2 Interventions offered during the learning stage that are perceived as being helpful to licence acquisition were more attractive for engagement

Despite the insight participants had into the stresses of driving after they passed their test, and how little they really knew in their early driving careers, there was a desire from learners interviewed to progress through licensing as soon as possible.

Especially for the hazard perception training and education interventions, and even slightly for the logbook, **participants consistently mentioned their desire for content that would help them with licence acquisition, and especially the theory test**. It is possible that some non-engagement was driven by a perception that engaging with content that may *not* help in this respect was pointless.

Additional content that would be in some way useful after the test (for example, knowledge that would help with the financial side of car ownership) was also reported as being desirable by learners interviewed.

9.3 The shift to 'real driving' moves the focus to safety, but perceived helpfulness of interventions was still important for engagement

There was a notable shift in the tone of comments from novices interviewed, relative to learners interviewed, in terms of their more obvious focus on safety. It is as if **the focus on 'passing the test' very quickly shifts to one of 'staying safe' once the realities of post-test, unsupervised driving hit home**.

Importantly however, **novice participants still fed back the importance of understanding what the benefits of the interventions would be for their post-test driving**, to improve their attractiveness and encourage engagement. Those who engaged well with the mentoring agreements intervention for example said they understood how it would help them pace their development in their early driving career, helping them to retain their new-found independence.

9.4 Opportunities for self-reflection were appreciated

Across most (if not all) interventions, **participants noted how much they valued the opportunity to reflect on their own driving, including potential risks and how they might overcome them**. For the mentoring agreements and logbook interventions specifically, the ways in which they could be used to 'self-pace' was highlighted.

This theme highlights the fact that, for all their focus on passing their test and gaining new-found freedoms, the learner and novice drivers interviewed appeared capable of responding positively to a deeper consideration of the risks and nuances associated with motorised

mobility once they engaged. **Self-reflection may be an important teaching technique to include in any interventions to encourage engagement**.

9.5 Getting 'the basics' right, in terms of usability and communication, was critical for engagement

Interventions needed to be well communicated and usable to encourage people to use them in the first place, and to stay engaged.

This theme came across strongly in the interviews with participants. For all the interventions, participants reported a desire for even more reminders to help them remember to engage (in particular, in-app reminders for app-based interventions). They also highlighted the importance of any materials (app-based, web-based or otherwise) being easy to use and bug-free to encourage use.

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Appendix A What is known about young and novice drivers – the starting point for the Driver2020 project

This section expands on the summary provided in Section 1.

A.1 Young and novice drivers represent a long-standing road safety challenge

Half a century ago, Goldstein (1972) noted "That youthful drivers…are over-represented in accidents…considerably beyond their proportion in the driving population, has been well known for several decades…". Within the same context Goldstein also drew attention to the widely observed fact that those with little experience of a new task tend to make more errors and show less dependable skill and judgement in its execution than those with more experience. Thus, it would not be a stretch to claim that the safety challenge presented by young and novice drivers is something that has been known for three-quarters of a century, and the group is still over-represented in fatal and serious crashes (e.g. House of Commons, 2021). Evidence from research into this group has confirmed that age and experience both play a role in an increased risk of being involved in road collisions.

A.2 Increased age and increased experience are associated with reduced risk

Studies in multiple countries have shown that the collision risk of new drivers is greater than that of more experienced drivers (Wells, Tong, Sexton, Grayson & Jones, 2008; Mayhew, Simpson & Pak, 2003; McCartt, Shabanova & Leaf, 2003; Sagberg, 1998; Forsyth, Maycock & Sexton, 1995; Maycock, Lockwood & Lester, 1991). These studies also show that the younger drivers are at a greater risk of collision than older drivers (although it should be noted that risk rises again in old age). Several reasons are offered as to what it is about younger age that leads to greater risk, including those associated with lifestyle (for example driving while under the influence of alcohol, and with friends in the car who distract the driver) and neuroscience (for example the underdevelopment of the frontal lobes – see Isler & Starkey, 2008).

Figure A.1 shows data reproduced from Maycock et al. (1991), from Great Britain. These data are modelled from self-reported collisions, with exposure kept constant. The dotted lines in the figure show (separately for males and females) the first-year accident liability for drivers passing their test at a given age. The solid lines show accident liability for people who pass their test (and therefore begin driving) at age 17, as they get older and accumulate on-road driving experience. Around 90% of the collisions in this dataset and others like it in UK studies are so-called 'damage only' collisions. The remaining 10% is dominated by collisions in which slight injuries occurred. Serious injury collisions tend not to be frequent enough to study statistically in this way in sampled datasets.

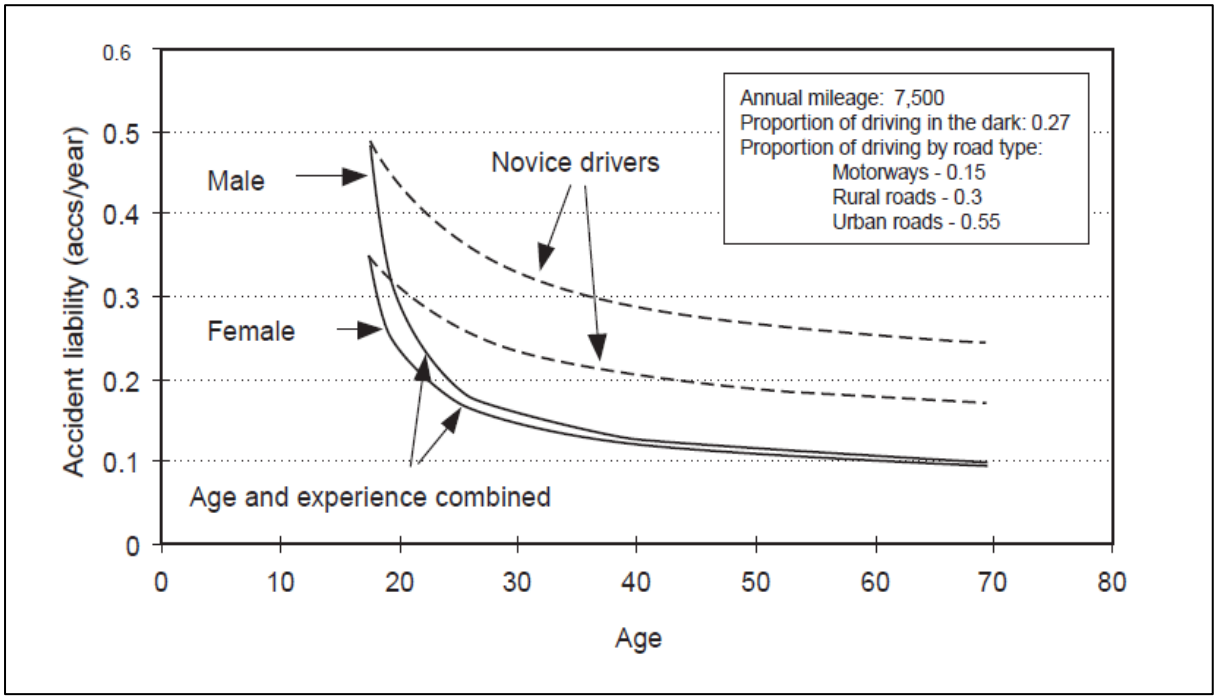

Figure A.1: The effects of age and experience on collisions risk (figure reproduced from Maycock et al., 1991)

While from data collected 30 years ago, this figure demonstrates the broad pattern of findings with respect to age and experience seen in modern datasets. All other things being equal, the younger a driver is when they begin unsupervised driving, the greater their risk of being involved in a collision, and new drivers of all ages become safer as they accumulate on-road experience. There are exceptions; for example, a subset of first-time passers in Sexton and Grayson (2010) were shown to have a lower crash risk despite being younger and reporting a driving style that has in general been associated with greater risk. However, the general protective effects of maturation and on-road experience are seen in multiple countries. Estimates suggest that most of the improvements in safety arising from experience come in the first 1,000-3,000 miles of independent driving (McCartt et al., 2003; see also Kinnear, Kelly, Stradling & Thomson, 2013).

It should be noted that collisions in the learner period, when drivers are supervised, are at a very low level compared with the levels reached when unsupervised driving begins (for example see Vicroads, 2017).

A.3 Approaches that target age and inexperience in higher risk situations have worked well to reduce risk in young and novice drivers

The most successful approaches to lowering the risk of collisions in this group have been those licensing approaches known collectively as ‘Graduated Driver Licensing’ (GDL). Such approaches focus explicitly on increasing the age at which drivers become licensed, and on increasing levels of on-road experience in safer conditions both before licensure (supervised driving), and afterwards (supervised driving, or solo driving in lower risk conditions). The evidence is summarised here; for readers interested in more detail, other reviews are

available (Kinnear et al., 2020; Kinnear & Wallbank, 2020; Kinnear, Lloyd et al., 2013; Russell, Vandermeer & Hartling, 2011).

Age has been targeted in several ways in GDL systems. The first way is to simply define the age at which someone can begin to drive unaccompanied, and the evidence suggests that when this is set to an older age, this increases safety (McCartt, Mayhew, Braitman, Ferguson & Simpson 2009). A second way in which age is targeted is to increase the minimum time for which someone needs to remain in the 'learner' phase of the licensing system. Evaluations of this have consistently found that longer periods lead to greater safety benefits (Senserrick & Williams, 2015).

A longer learning period also gives more opportunity for on-road practice. This has also been targeted directly in some licensing systems through the setting of minimum requirements; evidence from Australia suggests that if at least 120 hours of on-road practice can be achieved, this probably has safety benefits (Senserrick & Williams, 2015), although the evidence on this issue is less well established than on increasing licensure age and the length of learner periods.

The approach to managing post-licence experience in GDL is built on an understanding of specific higher risk situations for young and novice drivers. The reasoning is that if experience can be allowed to build up initially either in low-risk conditions, or when supervised in higher risk conditions, the probability of collisions can be reduced. The two higher risk situations that are most well understood are driving when carrying peer-age passengers and driving at night.

For drivers aged under 25, carrying at least one passenger has been shown by a systematic review of the literature (Ouimet et al., 2015) to increase fatal crashes by 1.24 to 1.89 times relative to solo driving. The risk estimate for carrying two or more passengers was 1.70 to 2.92. It has been shown that passenger restrictions in GDL systems lead to overall reductions in risk (Senserrick & Williams, 2015; Williams, 2017; Vaa et al., 2015; Begg & Stephenson, 2003).

Younger drivers are also known to be over-represented in collisions at night in the UK (Clarke, Ward & Truman, 2002) and it is known that the more night-time driving is restricted in GDL systems in the US, the greater the reductions in collisions (McCartt et al., 2010).

There are other components that are often found in GDL systems. These include alcohol restrictions, speed limits, vehicle power restrictions and the use of vehicle identifiers to signal licensing status. The evidence on these has proven difficult to isolate from the effects of other GDL components (for a recent summary see Kinnear et al., 2020).

Overall, the evidence shows that GDL components that focus on age and on-road experience, both before and after licensing, are effective at reducing collision risk in novice drivers.

A.4 Approaches based on education, training, technology, and other mechanisms have not fared as well in reducing risk

The literature on interventions described using labels such as 'driver education' and 'driver training' is very large. Consequently, there have been numerous systematic and narrative

reviews of it (Kinnear et al., 2013; Clinton & Lonero, 2006; Mayhew, Simpson & Robinson, 2002; Roberts & Kwan, 2001; Christie, 2001; Vernick, Li, Ogaitis, Mackenzie, Baker & Gielen, 1999; Mayhew, Simpson, Williams, & Ferguson, 1998; Brown, Groeger, & Biehl, 1987). These reviews have all come to the same conclusion, an example of which is the following quote from Helman, Grayson and Parkes (2010):

> "The only direct benefits imparted by broad driver education and training would appear to be the basic vehicle-control skills and knowledge of road rules necessary for entering the driving population. According to the evidence, it has no measurable direct effect on collision risk, and its continued use should therefore be set against much lower expectations in terms of what it can contribute directly to the safety of new drivers." (Helman et al., 2010, p8).

Such approaches can even cause harm; examples can be found in the literature regarding safety interventions such as skid-training courses that appear to promote over-confidence and risk-taking (Katila et al., 1996; Jones, 1993; Glad, 1988), and of driver education courses that can increase risk through allowing earlier licensure (Williams & Ferguson, 2004).

The conclusion from Helman et al. (2010) is necessarily in need of regular review since the specific theoretical approaches used in training and education (for example behaviour change techniques – see Fylan, 2017) and the technologies available to support them develop over time.

One promising approach, which illustrates the fast pace of technology development and the need for sound evaluation, is the use of 'telematics'. Typically, such technologies are used as part of insurance policies for young drivers. Tong et al. (2015) reviewed the literature on such approaches and concluded that no convincing evidence existed that they reduce risk. According to Tong et al., one of the main issues with the literature is that it is not feasible to utilise insurance data alone in evaluating such technologies, because of the self-selection and insurer-selection biases inherent in such datasets. Without properly matched control groups of drivers who do not have such policies, it is not possible to properly evaluate any change in risk associated with having such a policy independently of other effects, such as the types of drivers who typically have such policies.

One study that does have data on telematics policies, with a comparison group – albeit not one free from the biases mentioned above – is that of Helman et al. (2017). In a dataset from over 4,000 novice drivers in the UK, the study examined those factors associated with collision risk at six months post-test, when age and exposure were controlled. Those drivers in the sample with a telematics-based insurance policy reported *more* collisions at six months post-test than those without such a policy (the increase in risk after correcting for exposure and age was 50%). This concerning finding may have arisen due to biases in the groups and illustrates the importance of undertaking research from which causality can be inferred; innovation without controlled evaluation is not enough.

Appendix B Interview topic guides – High level of engagement

B.1 Mentoring agreements topic guide

Background – your general driving (learning to drive, and since passing your test)

1. Why did you want to learn to drive?
2. How did you feel about driving when you first started learning? *Prompts: What were you most worried about? What did you find the hardest?*
3. How did you feel about driving after you passed your test? *Prompts: What were you most worried about? What did you find the hardest?*
4. How well-prepared did you feel for driving after you passed your test? *Prompts: Were there things you still felt you needed to learn? Had you driven on all types of roads and situation before passing your test?*
5. What were the biggest challenges you faced in your early driving after passing your test? *Prompts: Think about the first few weeks or months*
6. Have you done any further supervised practice with anyone after passing your test? *Probes if 'yes' – who? Driving instructor? Family or friends? How much? What types?*

Impact of COVID-19

7. Did the pandemic and the restrictions impact your learning to drive experience?
8. How? Did it take longer to learn? Did you get less experience on the road?
9. Were you able to take your test when you were ready? Did your test or lessons get cancelled?
10. Did the COVID-19 pandemic and restrictions impact on your driving after your test? If so, how?

Using the mentoring agreement materials

11. When did you first look at the mentoring website or materials? *Prompts: As soon as you were asked? After a few weeks?*
12. Were the materials easy to use? *Probe as needed (website, videos, downloadable materials. agreement forms)*
13. What made it easy to use? What made it difficult to use?

Your own mentoring agreement

14. Who did you use the mentoring agreement with? *Prompts: Parents? Alone?*
15. How many agreements did you set?
16. What kind of rules did you agree? *Prompts: Night-time driving? Passenger carrying? Weather? Anything else? - how did they approach this? What language do they use for this – they agreed, or we agreed?*
17. How successful were you at keeping to the agreement?

18. Was it easy or difficult to find time to implement the agreement(s)? 1) do the agreement & 2) time to implement the agreement (planning to drive/how did they plan this into their day)?
19. At what point did the agreements become more relaxed? Why was this?

Influence of the mentoring agreement on you

20. Did the mentoring agreement give you information about driving that you wouldn't have otherwise been aware of? *Prompts: Risks of night-time driving. Risks of driving with friends*.
21. To what extent do you feel that using the mentoring agreement has influenced your confidence as a driver? *Probes if it has: How? Specific driving situations in which you feel more confident? Any in which you feel less confident?*
22. To what extent do you feel using the mentoring agreement has influenced your safety as a driver? *Probes if it has: How? Specific driving situations in which you feel safer? Any in which you feel less safe?*
23. Do you feel like the mentoring agreement had any other impact on your life outside of driving? *Prompts: Social life. Education. Work. If it did, how did you adapt to this?*
24. Would you recommend the mentoring agreement to a friend or relative? *Probe if yes: What advice would you give them about it, if any?*

And finally

25. Do you have any further thoughts or comments about learning to drive, driving, using the mentoring agreement, or taking part in Driver2020?

B.2 Logbook app topic guide

Background - Learning to drive

1. Why did you want to learn to drive?
2. How did you feel about driving when you first started? What were you most worried about?
3. And how do you feel now?
4. How do you feel you progressed through learning to drive to where you are now?
5. What were the biggest challenges you faced when learning?
6. Did you practice with a driving instructor?
    a. How many lesson/hours did you have with an instructor (roughly)?
7. Did you practice with anyone else (e.g., parent/guardian/relative/friend)?
    a. How often did you practice with them (roughly)?
    b. If so: Do you feel they were a good role model as a driver?
8. Did you receive any practical or financial help with learning to drive? e.g. parents paying for insurance, petrol or driving lessons?

Interacting with the Logbook app

9. How soon after starting to learn did you download the app?
10. Was it easy to download and set up?
11. What factors made it easy to use? What factors made it difficult to use?
12. Who did you use the app with? Your instructor? Parent/Parent/another supervising driver?
13. How did your instructor respond when you told them you wanted to use the logbook? What about other supervising drivers?
14. Did you use any other apps when learning to drive?
15. How often did you complete the logbook with your instructor/parent/mentor?
    a. How easy was it to find time to do this?
    b. When did you tend to do this?
    c. Who made sure you completed it?
16. Did you talk to your friends and/or parents/relatives about the app?
17. To what extent would you recommend using the logbook to a friend or relative?
18. What advice would you give to someone who is just starting to learn to drive and is using the logbook app?

Implementation of the app

19. In general, can you summarise what you…
    a. liked about using the logbook app?
    b. disliked about it or needs improvement?
20. Did the app encourage you to practice any situations that you might not have otherwise? *Prompt: rural roads, night-time, motorways/fast roads/ congested roads/ roads with children/bicyclists*
21. Were there any scenarios that were more difficult to practice than others? Why was this?
22. Were there any scenarios missing in the app?
23. Was / Is the target of 100 hours practice achievable? What do you think would be a reasonable target?

Influence of the app on driving, confidence and safety

24. Did the app give you information about driving that you wouldn't have otherwise been aware of?
25. To what extent do you feel that using the logbook has influenced your confidence as a driver?
    a. In what scenarios (or driving conditions/situations) do you feel most confident?
    b. In what scenarios (or driving conditions/situations) do you feel least confident?
26. To what extent do you feel using the logbook has influenced your safety as a driver?

a. In what scenarios (driving conditions/situations) do you feel most safe?

b. In what scenarios (driving conditions/situations) do you feel least safe?

And finally

27. Do you have any further thoughts or comments about learning to drive, using the logbook app or taking part in Driver2020?

B.3 Telematics app topic guide

Background – your general driving (learning to drive, and since passing your test)

1. Why did you want to learn to drive?
2. How did you feel about driving when you first started learning? *Prompts: What were you most worried about? What did you find the hardest?*
3. How did you feel about driving after you passed your test*? Prompts: What were you most worried about? What did you find the hardest?*
4. How well-prepared did you feel for driving after you passed your test? *Prompts: Were there things you still felt you needed to learn? Had you driven on all types of roads and situation before passing your test?*
5. What were the biggest challenges you faced in your early driving after passing your test? *Prompts: Think about the first few weeks or months*
6. Have you done any further supervised practice with anyone after passing your test? *Probes if 'yes' – who? Driving instructor? Family or friends? How much? What types?*

Impact of COVID-19

7. Did the pandemic and the restrictions impact your learning to drive experience?
8. How? Did it take longer to learn? Did you get less experience on the road?
9. Were you able to take your test when you were ready? Did your test or lessons get cancelled?
10. Did the COVID-19 pandemic and restrictions impact on your driving after your test? If so, how?

Using the telematics app

11. When did you first look at the telematics app*? Prompts: As soon as you were asked? After a few weeks?*
12. Did you download the app?
13. Was the app easy to install and set up? *Probe as needed: If not, what about it was difficult?*
14. Was the app easy to use and understand?
15. What made it easy to use? What made it difficult to use?

Your experience of the telematics app

16. Did you involve anyone else in your use of the app? *Prompts: Did you show parents your scores and feedback? Did you discuss with friends?*
17. How useful did you find the feedback from the app? *Prompts: Driving scores? Information about treats? Did you use this feedback at all?*
18. Was it easy or difficult to use the feedback to improve your driving?
19. Was there any issue with the app in giving you feedback that didn't make sense to you?
20. Were you using any other telematics systems (such as from your insurance company)? *Probe if yes: Did the feedback from the Driver2020 app clash at all with the feedback from these other systems?*

Influence of the telematics app on you

21. Did the app give you information about driving that you wouldn't have otherwise been aware of? *Prompts: Risks of night-time driving. Risks of speed, acceleration.*
22. To what extent do you feel that using the app has influenced your confidence as a driver? *Probes if it has: How? Specific driving situations in which you feel more confident? Any in which you feel less confident?*
23. To what extent do you feel using the app has influenced your safety as a driver? *Probes if it has: How? Specific driving situations in which you feel safer? Any in which you feel less safe?*
24. Would you recommend the app to a friend or relative? *Probe if yes: What advice would you give them about it, if any?*

And finally

25. Do you have any further thoughts or comments about learning to drive, driving, using the telematics app or taking part in Driver2020?

B.4 Hazard perception training topic guide

Context of learning

1. How have you found learning to drive?
2. What were you most worried about when you first started driving?
3. Do you run your own car or borrow a car to practice?
4. Have you had any support learning to drive such as help with insurance, petrol or driving lessons?

Ease of use/ time

5. Thinking about the hazard perception modules –how easy to use were they?
6. How frequently did you practice?
7. Did you find time to practice?

8. How did the courses compare to the hazard perception test in your theory test? *Prompt: easier, harder*
9. Did you use other apps to help you? E.g., DVLA app?
10. Was the Driver 2020 app better or worse than these other apps? *Prompt: Why?*

Information

11. Thinking about the hazard perception modules - to what extent did they give you information about hazards that you didn't know before?

Feelings of confidence and safety

12. To what extent do you feel that hazard perception training has influenced your confidence as a driver? *Prompt: Why?*
13. To what extent do you feel that hazard perception training has influenced your safety as a driver? *Prompt: Why?*

Acceptability

14. To what extent would you recommend hazard perception training to a friend or relative?
15. What did you like about the training?
16. What would you change about it?
17. Do you think most people would bother taking the post-test modules if they had already passed the driving test? *Prompt: Why?*
18. Is there anything else you would like to say?

B.5 Education (classroom) topic guide

Context of learning

1. How have you found learning to drive?
2. What were you most worried about when you first started driving?
3. Do you run your own car or borrow a car to practice?
4. Have you had any support learning to drive such as help with insurance, petrol or driving lessons?

Ease of use/ time

5. Thinking about the classroom-based session, how easy was it to get to the session? *Prompt: transport, time etc.*
6. How many people were in your group?
7. What did you think of the small group work?
8. What did you think if the virtual reality headsets?
9. How easy was it to use the app?

10. In what ways did you find using the app useful?

Information

11. Did you learn about risks that you didn't know about before? What information was most helpful and why? In what ways?
12. How did the hazard perception app compare with other online apps?
13. How useful was it to have goals to work towards?

Feelings of confidence and safety

14. To what extent do you feel that the sessions has influenced your confidence as a driver? *Prompt: Why?*
15. To what extent do you feel that the sessions have influenced your safety as a driver? *Prompt: Why?*

Acceptability

16. To what extent would you recommend the course to a friend or relative?
17. What did you like about the course?
18. What would you change about it?
19. Is there anything else you would like to say?

B.6 Education (eLearning) topic guide

Background – Learning to drive

1. Why did you want to learn to drive?
2. How did you feel about driving when you first started learning? What were you most worried about? What did you find the hardest?
3. How did you feel about driving after you passed your test/do you feel now? What were you most worried about? What did you find the hardest?
4. How well-prepared did you feel for driving after you passed your test/do you feel now?
    a. Were there things you still felt you needed to learn?
    b. Had you driven on all types of roads and situation before passing your test?
5. (If passed test) What were the biggest challenges you faced in your early driving after passing your test? *Prompt: Think about the first few weeks or months*
6. (If passed test) Have you done any further supervised practice with anyone after passing your test? *Probes if 'yes' – who? Driving instructor? Family or friends? How much? What types?*

Impact of COVID-19

7. Did the pandemic and the restrictions impact your learning to drive experience?
8. How? Did it take longer to learn? Did you get less experience on the road?

9. Were you able to take your test when you were ready? Did your test or lessons get cancelled?
10. Did the COVID-19 pandemic and restrictions impact on your driving after your test? If so, how?

Ease of use/ time

11. Thinking about the online course, how easy was it to access them? *(Prompt: technology issues, bandwidth)*
12. What did you think of the content in each of the modules?
    a. Module 1 - Driving Goals
    b. Module 2 – Hazards
    c. Module 3 – How to drive
    d. Module 4 – When to drive
    e. Module 5 – Goal-setting and self-monitoring
13. How easy was it to navigate the modules on the device you used? *Prompt: web-browser, smartphone, tablet*
14. In what ways did you find using the app useful?

Information

15. Did you learn about risks that you didn't know about before?
    a. What information was most helpful and why?
    b. In what ways?
16. How did the hazard perception content compare with other content you may have used?
17. How useful was it to have goals to work towards?

Feelings of confidence and safety

18. To what extent do you feel that the course has influenced your confidence as a driver? *Prompt: Why?*
19. To what extent do you feel that the course has influenced your safety as a driver? *Prompt: Why?*

Acceptability

20. To what extent would you recommend the course to a friend or relative?
21. What did you like about the course?
22. What would you change about it?
23. Is there anything else you would like to say?

Appendix C Interview topic guide - Low level of engagement

Background

1. Why did you want to learn to drive?
2. How did you feel about driving when you first started learning? *Prompts: What were you most worried about? What did you find the hardest?*
3. How did you feel about driving after you passed your test/do you feel now? *Prompts: What were you most worried about? What did you find the hardest?*
4. How well-prepared did you feel for driving after you passed your test/do you feel now? *Prompts: Were there things you still felt you needed to learn? Had you driven on all types of roads and situation before passing your test?*
5. (If passed test) What were the biggest challenges you faced in your early driving after passing your test? *Prompts: Think about the first few weeks or months*
6. (If passed test) Have you done any further supervised practice with anyone after passing your test? *Probes if 'yes' – who? Driving instructor? Family or friends? How much? What types?*

Impact of COVID-19

7. Did the pandemic and the restrictions impact your learning to drive experience?
8. How? Did it take longer to learn? Did you get less experience on the road?
9. Were you able to take your test when you were ready? Did your test or lessons get cancelled?
10. (NOVICES ONLY – Telematics group and Mentoring Agreements group): Did the pandemic and restrictions impact on your driving when you passed your test? If so, how?

Mentoring agreements (full engagement would be logging in, setting up and completing all the possible agreements)

11. Before you started, what was your understanding and expectations of using the mentoring agreement? (content/commitment/fears/barriers)
12. Did you look at the materials? Did you try to and couldn't?
13. How much did you use the agreements? Did you use them at all?
14. Can you tell me why you only used the agreements X amount/did not use them? Was there any reason why you did not engage with the agreements? Can you explain a bit more? Any specific barriers that you faced, i.e., features that did not work, forgot, did not feel confident, didn't see the point etc
15. Is there anything that would have helped you to use the agreements more? Can you explain how this would have helped?
16. Are there any specific features you feel that the mentoring agreements should have that would have helped you with your post-test driving? How would these features have helped you?

Logbook (full engagement would be downloading the app and using it regularly with instructor/mentor)

17. Before you started, what was your understanding and expectations of using the logbook app? (content/commitment/fears/barriers)
18. Did you download the app? Did you try to download the app and couldn't?
19. How much did you use the app? Did you use the app at all?
20. Can you tell me why you only used the app X amount/did not use the app? Was there any reason why you did not engage with the app? Can you explain a bit more? Any specific barriers that you faced, i.e., features that did not work, forgot, did not feel confident, didn't see the point etc
21. Is there anything that would have helped you to use the app more? Can you explain how this would have helped?
22. Are there any specific features you feel that it should have that would have helped you to learn to drive? How would these features have helped you?

Telematics (full engagement would be downloading app and using for the first 12 months of driving)

23. Before you started, what was your understanding and expectations of using the telematics app? (content/commitment/fears/barriers)
24. Did you download the app? Did you try to download the app and couldn't?
25. How much did you use the app? Did you use the app at all?
26. Can you tell me why you only used the app X amount/did not use the app? Was there any reason why you did not engage with the app? Can you explain a bit more? Any specific barriers that you faced, i.e., features that did not work, forgot, did not feel confident, didn't see the point etc
27. Is there anything that would have helped you to use the app more? Can you explain how this would have helped?
28. Are there any specific features you feel that it should have that would have helped you with your post-test driving? How would these features have helped you?

Hazard perception modules (full engagement would be logging in and completing all three modules – trigger points were booking theory test, booking practical test and passing practical test)

29. Before you started, what was your understanding of and expectations of doing the Hazard Perception modules? (content/commitment/fears/barriers)
30. Did you log in to the online modules? Did you try to log in and couldn't?
31. Did you try and complete any of the modules? How many of the modules did you do?
32. Was there any reason why you did not make full use of the online modules? Can you explain a bit more? Any specific barriers that you faced, i.e., did not work, forgot, did not feel confident, didn't see the point etc

33. Is there anything that would have helped you to engage with the online modules? Can you explain how this would have helped?
34. Are there any specific features you feel that it should have that would have helped you to learn to drive? How would these features have helped you?

Education course (full engagement would be attending a course and using the app afterwards) – FOR PEOPLE WHO DID NOT ATTEND COURSE

35. Which course were you offered: the online or face-to-face course? Before you started, what was your understanding and expectations of the course? (content/commitment/fears/barriers)
36. What were the reasons for you not being able to attend the course? Did you try to book a course? Did you book a course and were unable to go?
37. Did you want to go on a course but couldn't? Please tell me more about what happened and why.
38. Was there any reason why you could not book or go on a course? Can you explain a bit more? Any specific barriers that you faced, i.e., no availability, travel/logistics, costs, did not feel confident, didn't see the point etc
39. What would have helped you / encouraged you to go on the course? Can you explain how this would have helped?
40. Are there any specific elements that you think it should have that would have helped you to learn to drive? How would these features have helped you?

Education course (full engagement would be attending a course and using the app afterwards) – FOR PEOPLE WHO ATTENDED COURSE

41. Which course were you offered: the online or face-to-face course? Before you started, what was your understanding and expectations of the course? (content/commitment/fears/barriers)
42. Did you download the app that was linked to the course? Did you try to download the app and couldn't?
43. Did you use the app at all?
44. Was there any reason why you did not use the app? Can you explain a bit more? Any specific barriers that you faced, i.e., features that did not work, forgot, did not feel confident, didn't see the point etc
45. Is there anything that would have helped you to engage with the app? Can you explain how this would have helped?
46. Are there any specific features you feel that it should have that would have helped you to learn to drive? How would these features have helped you?

Appendix D Topic guide for delivery partner interviews

First, set up the interview using the following (or similar):

"We want to discuss the delivery of the interventions, including what went well and what could have been improved. We'll also touch on your thoughts on engagement, how the intervention are likely to achieve their aims, and how you would see this intervention being delivered in the future.

"We really want you to imagine that the last few years/months have been a pilot for you, testing your new intervention. The main overall question is – what are you going to do off the back of this pilot?

"Note that we do not want to discuss things today about the Driver2020 project itself (except brief discussion of COVID-19 at the end). Any feedback you might have on that we can cover at another meeting."

1. First – can you describe in your own words, what your intervention was designed to do, and how would you have expected it to improve safety in newly qualified drivers? *(This checks how their understanding of the logic model aligns with ours).*
    a. Prompts:
        i. Which elements did you think were most important?
        ii. Were there any unintended consequences that you foresaw?
2. So – how did 'the pilot' go? *(Completely open.)*
    a. Prompts:
        i. Did the pilot change anything about your expectations about how the intervention would improve safety?
        ii. Did you spot any other unintended consequences?
        iii. And what other lessons did you learn through the pilot about the content? What about things that you really struggled with?
        iv. What about changes you would make to the content?
        v. What about changes to the process of interacting with participants?
3. Now we'd like to explore how much, and how, people engaged with your intervention. How did that go? *(We want to understand how they experienced engagement – and ultimately this leads into how they would roll this out – assuming it is effective.)*
    a. Prompts:
        i. Did people who engaged do so as you expected? Or did they engage but lose interest? Or something else?
        ii. Did as many people engage as you had expected? Why? What did you think led to this?
        iii. Process of booking/downloading/contacting people – how did this go?
        iv. Did you change anything to encourage more engagement, and did it work?

4. Given everything you have learned, how would you roll this out? (Gets intel from those who deliver about how to improve engagement, and sustainability.)
    a. Prompts:
        i. What would you change about the intervention? New content to improve effectiveness?
        ii. What would you change about how it is offered to people? (Mandatory? Voluntary but encouragement through money? Any other ideas?)
5. Given the following roll-out scenarios, what do you think would be the main problems with each? (Helps us understand their thoughts on roll-out for likely scenarios. Note we would have to fine-tune these scenarios for each intervention.)
    a. Mandatory roll-out
    b. Voluntary roll-out (no incentives)
    c. Voluntary roll-out (with incentives through insurance, vouchers etc.)
    d. Others?

    For all – prompts as follows:

        Engagement

        Hard to reach groups – accessibility – equality of access
6. Finally – is there anything you would like to say around the COVID-19 pandemic – how did this impact on your intervention?
    a. Prompts
        i. Engagement
        ii. Any feedback from participants or things you noticed about participants?
7. Is there anything else you would like to say?

Driver2020 - an evaluation of interventions designed to improve safety in the first year of driving

The Driver2020 project evaluated the real-world effectiveness of five interventions designed to reduce collisions and risk in learner and novice drivers aged 17-24 in Great Britain. Three interventions were delivered to learner drivers. These were a logbook (designed to increase on-road practice), a hazard perception training e-learning intervention (designed to improve hazard perception skill) and a classroom-based education intervention designed to improve a number of safety-related attitudes and behaviours. Two interventions were delivered to novice drivers in their first 12 months of post-test driving. These were a mentoring agreement (designed to encourage drivers to set voluntary limits on high risk driving situations such as driving at night and with peer-age passengers) and a telematics intervention (that provided feedback on driving style).

This report presents findings from interviews undertaken with 134 participants in the study to identify key themes relating to engagement and non-engagement with the interventions. This information will be useful in planning the roll-out of any of the interventions. The main finding was that interventions perceived to be useful in some way other than providing safety benefits were more attractive for engagement; during the learning process, help towards licence acquisition was seen as important, while during post-test driving, benefits such as helping with the pacing of development, or with practicalities such as car ownership, were noted as desirable. The opportunity for self-reflection was also mentioned as being valued. Finally, basic usability and communication was mentioned as critical for engagement, as people very quickly lose trust in apps or other materials that appear not to work easily.

Other titles from this subject area

PPR2009 Weekley J, Helman S, Chowdhury S, Hammond J and Hutton J (2024a). Driver2020 – an evaluation of interventions designed to improve safety in the first year of driving. Report D1: Effectiveness of interventions delivered to novice drivers. Commissioned and funded by the Department for Transport. Crowthorne: Transport Research Laboratory.

PPR2010 Weekley J, Helman S, Makosa H, Harpham N and Hutton J (2024b). Driver2020 – an evaluation of interventions designed to improve safety in the first year of driving. Report D2: Effectiveness of interventions delivered to learner drivers. Commissioned and funded by the Department for Transport. Crowthorne: Transport Research Laboratory.

PPR2012 Helman S and Weekley J (2024). Driver2020 – an evaluation of interventions designed to improve safety in the first year of driving. Report D4: Summary of findings. Commissioned and funded by the Department for Transport. Crowthorne: Transport Research Laboratory.

PPR781 Pressley A, Fernández-Medina K, Helman S, McKenna FP, Stradling S and Husband P (2016). A review of interventions which seek to increase the safety of young and novice drivers. Commissioned and funded by the Department for Transport. Crowthorne: Transport Research Laboratory.

TRL
Crowthorne House, Nine Mile Ride,
Wokingham, Berkshire, RG40 3GA,
United Kingdom
T: +44 (0) 1344 773131
F: +44 (0) 1344 770356
E: enquiries@trl.co.uk
W: www.trl.co.uk

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