DSA
DRIVING STANDARDS AGENCY
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On the road to independence

Research report 2

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Driving Standards Agency (DSA)

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The feasibility of introducing independent driving into the GB driving test: Phase 2 final report

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Executive summary

Background

The Driving Standards Agency (DSA) is trialling two new 'independent driving' tasks for possible inclusion in the GB practical driving test. Independent driving refers to the ability of drivers to make driving-related decisions independently of an accompanying driver (such as their instructor or examiner, or a family member). Currently, unaccompanied post-test driving is fundamentally different from pre-test learning in this regard since pre-test learning always involves an accompanying driver who provides assistance and navigation information to the learner, while post-test driving invariably does not. By including independent driving exercises in the pre-test learning period it may be possible to ensure that learners acquire relevant experience of independent decision-making before passing their test.

It is hoped that the new tasks will increase the face validity of the driving test in learner drivers. Previous work has shown that learner drivers perceive the driving they do post-test to be very different to the driving they do pre-test (e.g. Christmas, 2007), and data from an early pilot study (Helman, Vandrevala & Hutchins, 2008) suggest that many learners perceive the new independent driving tasks as more relevant to 'real driving' than the current driving test. It is also hoped that by matching pre-test driving more closely to post-test driving, a reduction in the number of young novice drivers being involved in road crashes can be achieved. Post-test experience is one of the few things that are known to decrease crash risk (e.g. Mayhew, Simpson & Pak, 2003; Maycock, 2002; Williams, 1999).

Method and research questions

The current study collected performance data (faults on the DL25 form) from 459 learner drivers in mock driving tests at seven driving test centres across GB. Qualitative data from focus groups and interviews with some of the learner drivers involved were also collected. The following three research questions (related to the feasibility of introducing the new tasks) were addressed:

1. What is the impact of the two independent driving tasks on driving performance, as measured by driving faults and serious/dangerous faults, when compared with 'normal driving'?
2. Does this impact differ for learner drivers who do not consider English to be their first language, or learner drivers who consider themselves to have a disability?
3. Do learner drivers who do not consider English to be their first language and/or learner drivers who consider themselves to have a disability hold differing views regarding the new tasks than those held by candidates who do not fall into these categories?

The final part of this research programme explored new drivers' perceptions of the proposed independent driving tasks. Focus groups were used in a qualitative follow-up study to evaluate the extent to which newly qualified drivers felt that their experience of the 'following verbal directions from memory' or 'following road signs' tasks equipped them with the skills they needed to drive safely post licence.

The qualitative follow-up study addressed the following research questions:

1. Did those individuals who had passed their practical driving test feel that the independent driving tasks were relevant to post-licence driving?
2. What other independent experiences had they come across in their post-licence driving that they would have liked to have experienced as part of their training and testing?

Results

The key findings can be summarised as follows:

1. There was no significant impact of the two independent driving tasks on the number of driving faults or serious/dangerous faults made by candidates who have English as a first language, and who do not consider themselves to have a disability.
2. There was a significant impact of the two independent driving tasks on the number of driving faults made by candidates who do not consider English to be their first language. The magnitude of the difference is such that on the new independent driving tasks, candidates who did not consider English to be their first language made around one extra driving fault per two miles of exposure to the tasks, over and above the faults made during 'normal driving' (i.e. driving while taking ongoing instructions from the examiner).
3. Participants from both minority groups (non-first language English participants and participants who consider themselves to have a disability) considered the new independent driving tasks to be more challenging than normal driving. However there was widespread acceptance of the new tasks and unanimous support for introducing them into the driver training and assessment protocol.
4. Despite the difficulties and challenges candidates recognised the importance and relevance of these new tasks to "real driving" (driving they would do after passing the test) and were positive that, given the appropriate training and practice, they would be able to perform the new tasks.
5. The results from the qualitative follow-up study demonstrate support for the ways in which experience with independent driving tasks during learning might affect post-licence driving. The 'following road signs' task was considered to be particularly useful in increasing the relevance of pre-licence driving to post-licence or 'real' driving. The concept of following a series of directions was considered to be useful because there would be situations in which new drivers get lost, but respondents stated that the structure of the task did not necessarily map onto how new drivers in the 'real world' would follow directions.

Recommendations

On the basis of the results, the following recommendations were made:

1. The independent driving tasks trialled in this study should be introduced into GB driver testing, so that training of independent driving is stimulated.
2. The effectiveness of the introduction of independent driving in terms of accident reductions for newly qualified drivers needs to be evaluated. In particular, the accident risk of novice drivers who have been exposed to the new tasks as part of their driver training and testing, and new drivers who have not been exposed to the next tasks should be investigated.
3. Alongside the evaluation of effectiveness in terms of accident risk it will be important to ensure that Approved Driving Instructors (ADIs) train the independent driving tasks as intended. The argument that pre-test independent driving will reduce accident rates post-test rests on the assumption that they expose learner drivers to tasks that are typical of post-test driving as part of their pre-test learning. However, this assumption is only valid if ADIs train the tasks as intended. If ADIs adopt an approach based on optimising test-passing by training specific test routes, this may undermine any potential road safety benefits of the new exercises. DSA could take a lead on this issue by developing a guidance document or training for ADIs to maximise the potential safety benefits of the new tasks. This will also have the benefit of ensuring that the new tasks cover

the 'awareness of risk increasing factors' and 'self evaluation' columns of the GDE matrix (see Figure 1.1 in main report).

4. Evaluation of the extent to which post-test drivers feel that the new tasks have equipped them with the skills they need to drive safely should be carried out. This should involve the study of satisfaction levels in novice drivers who have been exposed to the new tasks as part of their actual driver training and testing, to see if the perceptions of the new tasks held by learner drivers in the current study, and in Helman, Vandrevala and Hutchins (2008) still hold post-test.
5. It is important that potential difficulties that may be faced by minority groups such as those whose first language is not English are taken into account in the implementation of the new tasks. Materials should be developed to aid the explanation of the new tasks in test situations. The instructions provided to introduce the new tasks need to be 'culturally appropriate' and presented in a culturally sensitive manner. Additional research on the ways in which instructions could be given to participants with a learning disability should be conducted.
6. Further research to investigate ways to explain the 'following verbal directions' task to participants would be beneficial in designing new training and preparation materials for this task.
7. It will be useful to understand whether different driving examiners adopt different criteria in awarding faults in the new tasks, as this may also have an impact on the introduction of the new independent driving tasks. A study looking at examiner and centre differences should address this issue.
8. Several other post-licence driving experiences were mentioned by respondents in the qualitative follow-up study including motorway driving, town driving, dealing with emergency service vehicles and driving in the dark. These areas may be suitable for future independent driving testing and training.

9.

Abstract

Independent driving refers to drivers making independent decisions regarding navigation and other aspects of the driving task, without input from an accompanying instructor or examiner. The Driving Standards Agency (DSA) are considering the introduction of independent driving tasks (specifically: following road signs; and following verbal directions from memory) into GB driver testing. Pilot work (Helman, Vandrevala & Hutchins, 2008) has suggested that learner drivers find such independent driving tasks challenging, but that they see such tasks as being highly relevant to the 'real driving' they will experience after passing their test. The current study extends the previous work by using appropriate experimental controls to ensure that the effects of task difficulty are not confounded with road environment, and also examines the potential additional task difficulty that the new tasks may cause for learner drivers who do not have English as a first language, or who consider themselves to have a disability. 'Mock driving tests' were run at seven test centres across GB. The results suggest that those candidates whose first language is not English found the new independent driving tasks marginally more difficult on the road than driving with an examiner providing ongoing route directions. Compared to the 'normal driving' condition this group made on average one extra driving fault (as measured on the DL25 form) per two miles of driving, when 'following road signs' or when 'following verbal directions from memory'. Participants whose first language is English did not make any additional driving faults during the new tasks. Not enough participants who considered themselves to have a disability were tested to assess on-road performance for this group. As in Helman et al. (2008) all participants supported the usefulness of the new tasks in making driver testing more like 'real driving' experienced post-test, despite the perceived difficulty. Variations between test centres were observed, with some centres showing a larger difference in difficulty between the new tasks and normal driving. A follow-up qualitative study explored new drivers' perceptions of the proposed independent driving tasks, the results of which demonstrate support for the ways in which experience with independent driving tasks during learning might affect post-licence driving. Recommendations are made regarding the importance of experience if the new tasks are to be effective in reducing road crashes amongst novice drivers, and regarding the importance of evaluation of the new tasks for their impact on road safety, and on the face validity of the GB driving test.

1 Introduction

1.1 Background

The 2008 DSA consultation document ('Learning to drive: a consultation paper') sets out a number of proposed changes to driver testing and training in Great Britain (GB) focused on reducing the crash risk encountered by young, inexperienced drivers.

Data on the accident risk of new drivers show that after passing their test they are at their peak in terms of their risk of having an accident. A number of reviews have concluded that traditional driver training does not seem to have any positive effect on road safety in terms of accident reductions (Christie, 2001; Mayhew, Simpson, Williams, & Ferguson, 1998; Brown, Groeger, & Biehl, 1987). Reviews of pre-driver education have reached the same conclusion (Mayhew, Simpson & Robinson, 2002; Roberts & Kwan, 2001; Vernick, Li, Mackenzie, Baker & Gielen, 1999; Mayhew et al., 1998). In contrast, the acquisition of experience early in post-test driving is accompanied by substantial reductions in accident liability, particularly during the first six months of driving (Mayhew, Simpson & Pak, 2003; Maycock, 2002; Williams, 1999).

One interpretation of these findings is that the experience gained by drivers after passing their test is completely unlike the experience they gain pre-test. Findings from qualitative research on the perceptions of new drivers seems to support this; in focus groups learner drivers expressed their belief that 'real driving' is fundamentally different from the training required to pass the driving test (e.g. Christmas, 2007). Traditionally driver training in Great Britain (GB) has focused on the teaching of vehicle control skills. A number of authors (e.g. Christie, 2001; Brown et al., 1987) have suggested however that driver training should not only focus on vehicle control skills (a necessary pre-requisite for road use) but also on factors that have been shown to be related to accident reductions, according to the research evidence. These include higher perceptual skills such as hazard perception (McKenna & Crick, 1992), safer attitudes towards risk, and better self-awareness of one's driving ability (Hatakka, Keskinen, Gregersen, Glad, & Hernetkoski, 2002). Figure 1.1 illustrates this through the Goals for Driver Education (GDE) matrix (adapted from Hatakka et al., 2002).

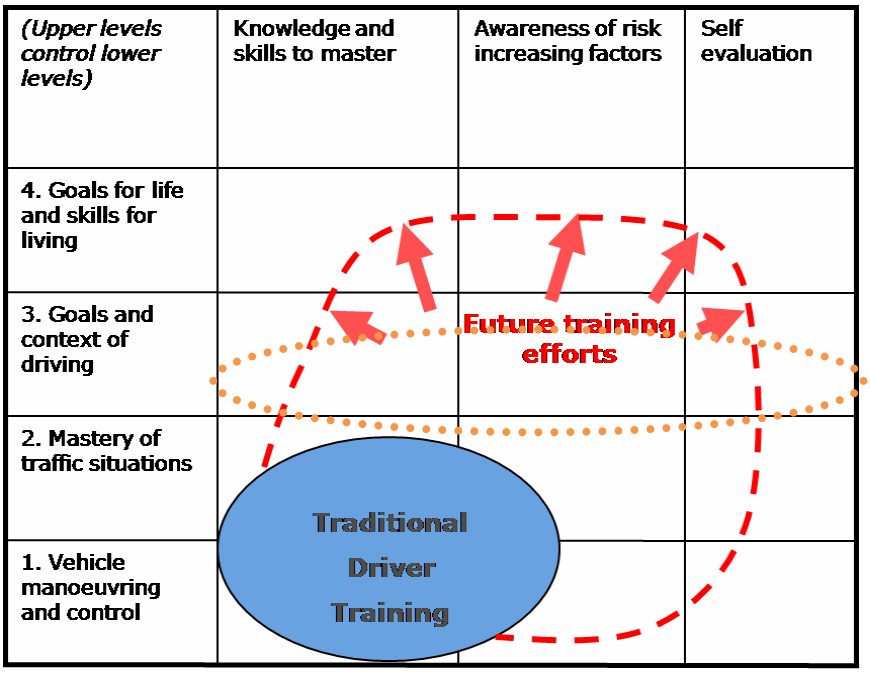

Figure 1.1: The Goals for Driver Education (GDE) matrix. Adapted from Hatakka, Keskinen, Gregersen, Glad & Hernetkoski (2002). Potentially, independent driving can be thought of as covering the area in the dotted orange ellipse (see Section 1.2)

Given that post-test experience seems crucial for reducing accident liability, it is theoretically possible that if the relevant elements of post-test experience can be identified and trained pre-test then driver training may be better placed than it is currently to reduce post-test accident risk. An existing example of this approach in GB driver training is the introduction of a video-based measure of hazard perception skill in 2002 as part of the driving theory test. Hazard Perception is the skill of anticipating traffic hazards on the road ahead, and can be thought of as falling under 'mastery of traffic situations' in the GDE matrix (see Figure 1.1). Hazard perception skill has been shown to increase with experience (McKenna & Crick, 1991; Sexton, 2000; Reikos, 2003). It is also the only driving skill that has been shown to be related to accident risk across a number of studies (e.g. Quimby, Maycock, Carter, Dixon & Wall 1986; Hull & Christie, 1993; McKenna & Horswill, 1999). Its introduction into the GB driving test driver training has been shown to have led to at least a 3% reduction in the accident liability of drivers in their first year of driving, when non-low speed accidents on a public road, and in which the driver accepted some blame, were considered[1] (Wells, Tong, Sexton, Grayson & Jones, 2008).

As a further step in an ongoing programme focused on making young drivers safer after they pass their test, the DSA is considering the introduction of independent driving exercises into the practical driving test, and into the training drivers receive pre-test. Independent driving refers to the ability of drivers to make driving-related decisions independently of an accompanying driver (such as their instructor or examiner, or a family member). Currently, unaccompanied post-test driving is fundamentally different from pre-test learning in this regard since pre-test learning always involves an accompanying driver who provides assistance and navigation information to the learner. Pre-test, the learner driver can use instructions provided by the accompanying driver as a cue to initiate safety checks (for example the 'mirror-signal-manoeuvre' procedure) that are crucial for maintaining situation awareness (e.g. Endsley, 1995). Post-test this is no longer possible; as soon as they begin driving post-test, drivers are forced to begin 'thinking for themselves' without having had any previous experience of such independent decision-making. By including independent driving exercises in the pre-test learning period it may be possible to ensure that learners acquire relevant experience of independent decision-making before passing their test. Although there is evidence that such tasks are accepted by learner drivers (Vissers, Meskin, Roelofs & Clasen, 2007) as yet there is no evidence bearing directly on the effectiveness of pre-test independent driving at reducing post-test accident liability. However it is hoped that such an approach will help to reduce new drivers' post-test accident risk in the same way that hazard perception testing has been shown to (Wells et al, 2008).

This study is the second of two studies aiming to evaluate the practical feasibility of introducing independent driving to the GB practical driver training and testing protocol. The first study is described below in Section 1.2, before the current study is described in more detail in Section 1.3. A previous literature review (Hutchins, 2008) examined the theoretical feasibility of introducing such tasks.

1.2 Phase 1 study at the DSA Training Centre, Cardington

Helman, Vandrevala and Hutchins (2008) conducted a pilot (Phase 1) study to examine the effects of three independent driving tasks on learner driver performance, and to examine the learners' and approved driving instructors' (ADIs) perceptions of the new tasks. The key research questions were related to how difficult learners found the new tasks, how they perceived them, and how performance and attitudes varied (if at all) in

[1] In this study, all accident types considered showed some reduction due to taking and passing the HP test. However public road non-low speed accidents and those where some blame was accepted were considered as more likely to be influenced by better HP skills and this proved to be the case.

relevant minority groups, specifically those without English as a first language and those with learning difficulties[2]. The tasks trialled were:

1. **Following verbal directions from memory:** Learners were given a short number of directions to follow as if from someone they had stopped and asked. They then followed these directions from memory while driving.
2. **Turn the vehicle in the road:** Learners were asked to imagine that they realised they were going the wrong way, and to turn the car around in the road using a method of their choice.
3. **Following road signs:** Learners were asked to follow road signs to a local town for a period of time.

In terms of the GDE matrix, these independent driving tasks can be thought of as covering the area of the dotted orange ellipse in Figure 1.1. The tasks are aimed at equipping learners with skills to master specific traffic situations, and potentially awareness of risk increasing factors and self-evaluation, and also are related to the goals and context of driving (navigation)[3].

Helman et al. (2008) showed that in terms of performance on the road, the 'following road signs' and 'verbal directions from memory' tasks resulted in approximately twice as many driving faults than the control condition of 'normal driving' during which learner drivers listened to ongoing directional instructions, as is the current practice in training and testing. In the 'following signs' task learner drivers also made five times as many serious/dangerous faults as in the normal driving condition. In the 'following verbal directions from memory' condition learner drivers made half as many serious and dangerous faults as during normal driving. Overall these results suggest that the following road signs task is more difficult (especially when considering serious/dangerous faults) than normal driving, and following verbal directions from memory is more difficult when considering driving faults, but easier when considering serious/dangerous faults.

Qualitative data collected from learner drivers after they completed the on-road tasks suggested that despite the challenging nature of the new tasks, they were well-received. Some disadvantages were reported, including the potential loss of control skills if learner drivers only acquire one method of turning the car in the road, and possible problems with minority groups (e.g. those without English as a first language).

The Cardington study was always intended as a pilot study that would scope the key perceptions of learners, and it has some limitations regarding the degree to which the results can be generalised. Specifically:

1. The tasks were confounded with the road sections on which they were carried out, meaning that the increased fault rate in the 'following signs' task may have been due to an especially difficult section of road being used for this task[4]. The confound may also explain why fewer serious/dangerous driving faults were committed in the 'following verbal directions from memory' task, given that the road section for this task contained fewer roundabouts and light-controlled pedestrian crossings (see Baughan, Sexton, Maycock, Simpson, Chinn & Quimby, 2006 for a study of how road features can affect real driving test results), possibly giving fewer opportunities for serious/dangerous faults to be committed.

[2] Throughout this report, these groups are sometimes referred to as 'non-English' and 'disability' groups. This terminology is used entirely for brevity, especially in figures. The meanings of the terms are "candidates who do not consider English to be their first language" and "candidates who do not consider that they have a disability" respectively.

[3] Note that as trialled in the current study, the tasks may not cover the 'awareness of risk increasing factors' and 'self evaluation' columns within the GDE matrix, since the trial was focused on gauging participant responses and performance in the new tasks in a test setting, rather than on developing the training materials. See the recommendations section of this report for more on this issue.

[4] Note that no formal comparison of the road sections used was carried out, although the DSA representatives and the TRL research team agreed that the initial section of road—used for 'following verbal directions from memory— was easier than the rest of the route.

2. There were insufficient data available from minority groups to answer the research questions associated with these groups comprehensively.
3. The practical issue of finding routes is likely to vary with area of the country (for example rural versus urban locations), and it is difficult to comment on this based on a study at a single location.

The Phase 2 study reported in this document aims to overcome these limitations[5].

1.3 Current study—Phase 2 (the seven centres study)

The current (Phase 2) study was run at seven centres across GB. These centres were Bangor, Bolton, Chertsey, Dorchester, Dundee, Hendon and Leicester. At each centre, a generic route structure was used (see Figure 2.1). This structure permitted a between-participants design to overcome the first limitation of the Phase 1 study—the confounding of task and road section. During the trial section of the route, each participant performed only one of the two independent driving tasks ('following verbal directions from memory' or 'following road signs'), or acted as a control participant by carrying out the section under 'normal' driving conditions. The 'turn the car in the road' task was not included in Phase 2 as Helman et al. (2008) showed that some learners, ADIs and DSA examiners considered that its inclusion in future training and testing may encourage learners to focus on the easiest manoeuvre (turn in the road) at the expense of others (e.g. reversing into a side road). It also was planned during Phase 2 that a much larger sample of participants from minority groups should be accessed. Specifically those candidates who do not consider English to be their first language, and those candidates who consider that they have some kind of disability were targeted.

Thus the research questions addressed in the current study were:

1. What is the impact of the two independent driving tasks on driving performance, as measured by driving faults and serious/dangerous faults, when compared with 'normal driving'?
2. Does this impact differ for learner drivers who do not consider English to be their first language, or learner drivers who consider themselves to have a disability?
3. Do learner drivers who do not consider English to be their first language and/or learner drivers who consider themselves to have a disability hold differing views regarding the new tasks than those held by candidates who do not fall into these categories?

1.4 Qualitative follow up study

The final part of this research programme explored new drivers' perceptions of the proposed independent driving tasks. Focus groups were used in a qualitative study to evaluate the extent to which new drivers felt that their experience of the 'following verbal directions from memory' or 'following road signs' tasks equipped them with the skills they needed to drive safely post licence (see Appendix G for full report).

The study addressed the following research questions:

1. Did those individuals who had passed their practical driving test feel that the independent driving tasks were relevant to post-licence driving?
2. What other independent experiences had they come across in their post-licence driving that they would have liked to have experienced as part of their training and testing?

[5] The practicality of finding routes was not addressed directly by the TRL research team. Appropriate routes for the study were selected by DSA representatives, guided by their professional judgement. Some recommendations on test route selection based on the findings from the analysis are put forward in this report.

1.5 Structure of report

The remainder of this report is structured as follows:

Section 2 describes the method used.

Section 3 describes the results in terms of on-road performance.

Section 4 describes the results from qualitative data gathered during focus groups and interviews with learner drivers.

Section 5 discusses key findings and draws conclusions.

Section 6 offers recommendations for the next steps of developing GB driver training and testing, using independent driving as a starting point for a wider range of new approaches.

Appendix G has details of the qualitative follow-up study, as described in Section 1.4.

2 Method

2.1 Sample and recruitment

2.1.1 General characteristics of sample who completed drives

Testing was carried out between January and April 2009. Participants for the study were recruited through the seven driving test centres used: Bangor, Bolton, Chertsey, Dorchester, Dundee, Hendon and Leicester. ADIs from the geographical areas served by each centre were invited to a briefing day run by DSA staff to explain the study purpose. ADIs were asked to bring forward candidates that they believed were 'test ready' (i.e. ready to take their driving test) to take part in the study. Candidates indicated their willingness to take part in the trial through telling their ADI. The ADI then contacted DSA and had their candidate booked into a testing slot at the relevant centre. The intention was that by recruiting candidates in this way the study sample would resemble the population of candidates actually presenting for test across GB.

Candidates were paid the price of a single practical test fee for taking part in the study, and ADIs were paid £75 for each candidate they presented. In total, 459 participants were recruited and took part in the study. The breakdown of participants across the seven test centres is shown below in Table 2.1:

Table 2.1: Number of participants from each test centre.

	Bangor	Bolton	Chertsey	Dorchester	Dundee	Hendon	Leicester	Total
Baseline	45	57	60	60	51	43	46	**362**
Non-English	4	10	4	1	5	27	19	**70**
Disability	2	2		11	4	5	3	**27**
Total	**51**	**69**	**64**	**72**	**60**	**75**	**68**	**459**

Before examining the performance data, the amount of training taken by the learners in the three conditions was examined to see if it matched the expected levels (of people who pass their test) from the Cohort II study (Wells et al., 2008). This is important as the ecological and external validity[6] of the current trial was based on recruiting 'test ready' candidates. Table 2.2 shows these data[7].

[6] Ecological validity is the degree to which the experimental setting is similar to the natural setting. External validity describes in how far the findings from an experiment derived from the experimental sample can be generalised to the target population.

[7] Note that candidates with extremely high self-reported levels of training time (greater than 200 hours) were excluded from these mean values on the basis of the perceived accuracy of the information given. The 200 hour limit was arbitrary, but more conservative than the 'three standard deviation' guidelines for extreme outliers suggested in the SPSS statistical package.

Table 2.2: Previous hours training with instructor.

Condition during trial section	Type of person	Mean number of hours training with instructor	Std. Deviation
Following traffic signs	Baseline	51.17	31.44
	Non-English	52.02	37.34
	Disability	38.45	24.34
	Total	**50.35**	**32.00**
Following verbal directions from memory	Baseline	52.82	31.07
	Non-English	63.24	49.72
	Disability	53.94	34.64
	Total	**54.20**	**34.00**
Normal driving	Baseline	48.21	28.79
	Non-English	47.37	32.09
	Disability	33.46	16.08
	Total	**47.57**	**28.78**
Total	Baseline	50.68	30.39
	Non-English	54.18	40.06
	Disability	43.03	27.63
	Total	**50.69**	**31.71**

The table shows that the average amount of training with instructors for the sample as a whole was 50.68 hours for baseline participants, 54.18 hours for 'non-English as first language' participants and 43.03 for those participants who consider that they have a disability. The figures are all close to, and mostly higher than the 47 hours of training found in test passers in the Cohort II study. No significant differences were found between the three experimental conditions on the measure. The sample as a whole (and each subgroup) presenting for the trial is at least comparable to learner drivers presenting for test in the Cohort II study in terms of its experience of driving instruction, and therefore the sample is 'test ready' by that definition. Although there are no significant differences in levels of training between the groups, or conditions, the fact that if anything the means for the two experimental conditions ('signs' and 'series of directions') are higher than the 'normal driving' average means that any decrements in performance in these tasks will, if anything, be an underestimation of the true performance decrement.

2.1.2 Interviewees who considered English to be their second language

Thirty-six interviews were conducted with candidates who considered English to be their second language. Twenty-four such candidates who had consented to participating in the trial were not interviewed; of these 17 had completed 'normal driving' during the trial section of the drive and therefore were not eligible for participation in the interviews. The remaining seven candidates were either unavailable for interview, or did not respond to contact attempts.

The sample characteristics of candidates who considered English to be their second language are shown in Table 2.3. Equal numbers of men and women were interviewed, with the majority of candidates (n=22) completing the 'following road signs' task during the trial section of the drive. A large proportion of the interviews were conducted face to face (n=21), and the majority of candidates were recruited from Hendon and Leicester. Nearly half the candidates considered themselves to be native speakers of a South Asian language (Hindi, Urdu, Gujarati, Telugu or Punjabi). One-third of the interviews were conducted in the participants' native language.

Table 2.3: Sample characteristics: Non-Native speakers of English.

Gender	Male	18
	Female	18
Task	Following road signs	22
	Following verbal directions	14
Interviews	Face to face	21
	Telephone interviews	15
Centres	Hendon	14
	Leicester	12
	Bolton	5
	Dundee	3
	Dorchester	1
	Chertsey	1
1st Language	South-Asian (Hindi, Urdu, Gujarati, Telugu, Punjabi)	16
	African (Shona, French, Somali)	5
	Chinese (Mandarin, Cantonese)	4
	Eastern European (Albanian, Romanian)	4
	Other European (Portuguese, French, Norwegian)	4
	Turkish	1
	Japanese	1
	Iranian (Farsi)	1
Language in which interview conducted	English	27
	Native language	9

2.1.3 Interviewees who considered themselves to have a disability

Thirteen interviews were conducted with participants who reported having a disability, out of 23 such participants who took part in the study.

The sample characteristics of participants who reported having a disability are shown in Table 2.4. Nine male candidates and four female candidates participated in in-depth interviews. The majority of candidates had completed the 'following road signs' task. Over half of the interviews were conducted over the telephone. The majority of candidates (n=10) reported having learning difficulties, and in particular, dyslexia.

Table 2.4: Sample characteristics: Participants who considered themselves to have a disability.

Gender	Male	9
	Female	4
Task	Following road signs	8
	Following verbal directions	5
Interviews	Face to face	6
	Telephone interviews	7
Centres	Hendon	3
	Leicester	1
	Bolton	1
	Dundee	3
	Dorchester	4
	Bangor	1
Nature of Disability	Dyslexia	9
	Physical disability (vision impaired or limb amputated)	2
	ADHD	1
	Asperger Syndrome	1

2.2 Procedure

On the day of testing, candidates arrived at the relevant test centre and were asked three screening questions by the test centre manager, to identify the group into which the candidate would be placed ('baseline'; 'English not first language'; or 'disability'). After completing a consent form and a short demographic questionnaire (see Section 2.3) and being given the chance to ask questions about the trial, candidates were taken on the trial route (see Section 2.2.1). The drive was treated as a mock driving test, although it was made clear to candidates that the tasks and exercises to be carried out may be different to what would normally be part of a driving test. During the drive, the DSA test centre manager sat in the rear of the car and provided instructions as required, and marked driving faults and serious/dangerous faults as they occurred[8]. The candidate's driving instructor sat in the front seat, but only intervened in situations where the safety of the candidate or that of other road users would be compromised without intervention.

For the qualitative component of the trial, interviews were conducted with participants who either considered English to be their second language or those who reported having a disability. All of the participants interviewed had completed the independent driving tasks (following road signs or following verbal directions). Test centre managers

[8] Note that there were two differences between the recording of faults in this trial and the way in which they would ordinarily be recorded on a driving test: firstly all faults (even multiple occurrences of serious/dangerous faults) were recorded, since the purpose of the measure was to provide an estimate of task difficulty rather than a pass/fail decision; secondly, multiple occurrences of the same driving fault were not 'upgraded' to a serious/dangerous fault to represent a 'serious underlying problem'.

provided TRL with contact details of candidates who had consented to participating in the qualitative component of the study. TRL researchers contacted the candidates offering face-to-face or telephone interviews. It was originally planned that focus groups would be conducted in some of the locations. However due to a shortage of eligible participants, these were replaced by individual interviews.

2.2.1 Trial route

Figure 2.1 shows a schematic of the route structure used at the seven centres. At each centre, participants drove initially on a non-trial section (under 'normal driving' conditions). Then each participant carried out one of the following conditions in the 'trial' section: normal driving; following verbal directions from memory; or following road signs. Finally, all participants completed another non-trial section under normal driving conditions to return to the centre.

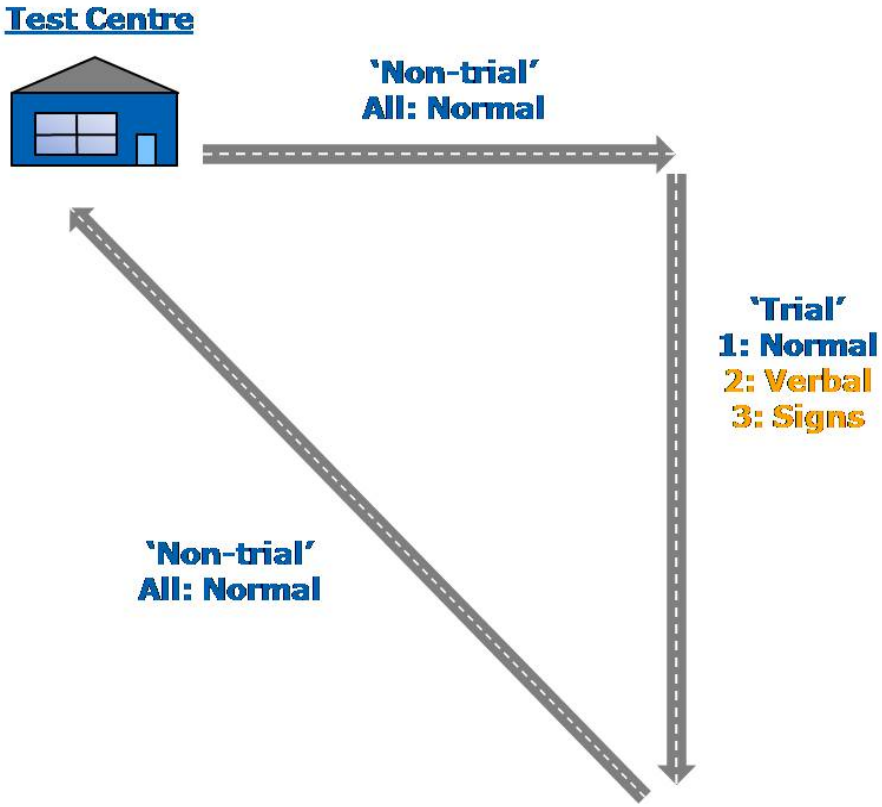

Figure 2.1: Diagram of mock test route incorporating trial road section.

The distances covered in each non-trial and trial section varied across test centres. They are listed in Appendix G. The distances covered were used to calculate a rate of driving faults (and serious/dangerous faults) per mile of driving at each centre.

2.2.2 Interviews

In-depth face-to-face or telephone interviews were conducted with some candidates (as described in Sections 2.1.2 and 2.1.3). The face-to-face interviews were conducted at the DSA test centre where the candidates had carried out their drive. Participants were given a short description of the study and were asked to sign a consent form (see Appendix E). For the telephone interviews, the consent form was read out to participants and verbal consent was gained over the telephone.

Candidates were asked to comment on their experience of following road signs or following verbal directions, as appropriate. The interview guide (see appendix F) included questions and prompts on the following:

- Perception of the independent driving section of the trial;
- Thoughts on DSA introducing this new task;
- Benefits for learner drivers if this task was introduced;
- Aspects of the new task learner drivers found easy, difficult, liked or disliked;
- Anticipated problems with the new task, if it was introduced;
- Relevance of the exercise to 'real' driving.

2.2.2.1 Social Inclusion Issues

The following information was used to introduce candidates to the social inclusion issues in which DSA was interested:

"DSA is keen to ensure that all groups of people can effectively do this task and therefore it is particularly keen to hear the views of minority groups, including those who may not consider English as their first language or drivers who consider themselves to have a disability".

Candidates were asked some further questions relating to:

- The particular challenges of doing the task for non-native English speakers;
- The ways in which the task was challenging or difficult for non-native English speakers (e.g. language barriers, translation, cultural issues).

Participants who considered themselves to have disabilities or special needs were asked similar questions. Further questions addressed training and preparation required to complete the new tasks. The full interview guide can be found in Appendix F. Participants were paid £35 for taking part in the interview.

2.3 Design

A two-way between participants design was used. The independent variables were type of person, which had three levels (baseline; first language not English; self-reported to have a disability) and task carried out during the trial section of the drive (see Section 2.2.1) which also had three levels (normal driving; following road signs; following verbal directions from memory).

The dependent variable was based on the rate of faults (separately for 'driving faults' and 'serious/dangerous' faults on the DL25 form; see Section 2.2 for how fault data were collected), and is described in detail in Section 2.3.1.

Analyses used on the fault data for baseline and non-English participants were two-way between-participant ANOVAs, and these are described in detail in the relevant results sections. The fault data from those candidates who considered themselves to have a disability were not formally analysed due to very low numbers of participants and the resulting low statistical power.

2.3.1 Performance measure (dependent variable)

The performance measure used was the difference between driving faults (or serious/dangerous faults) per mile in the non-trial section of the route, and driving faults (or serious/dangerous faults) per mile in the trial section of the route. The rate of faults (faults per mile) was calculated by measuring the length of non-trial and trial sections at each centre, and dividing the number of faults of each category by these section lengths.

The difference variable was calculated by subtracting the fault rate in the trial section at each centre from the fault rate in the non-trial section. For example if a candidate made 1.3 faults per mile in the non-trial section, and 1.1 faults per mile in the trial section, then the candidate would have a difference of 0.2. This would show that they made 0.2 fewer driving faults per mile in the trial section than in the non-trial section. Note that a negative score on this measure would mean that MORE faults were made in the trial section—i.e. that the trial section was more difficult than the non-trial section.

Note also that this measure removes some variability in the data (in the comparison between the tasks) due to individual differences, since individual ability should manifest itself in driving performance in the non-trial section as well as the trial section.

2.3.1.1 Controlling for the test centre effect

There was considerable variability between test centres in terms of performance. This variability is likely to be caused by numerous factors such as examiner differences, different routes and traffic conditions, and different numbers of road features on trial sections. Therefore to reduce this variability a normalisation procedure was carried out as described below.

For each centre the mean of the difference variable was calculated for baseline participants who were tested under 'normal driving' conditions. The difference variable for all groups was then adjusted for this mean. This procedure is best explained in an example:

In Dorchester:

A. the average number of driving faults per mile in the non-trial section, for baseline participants who follow normal directions in the trial section is: 0.88
B. the average number of driving faults per mile for these same baseline participants when they follow normal directions in the trial section is: 0.75
C. the difference in driving faults per mile is: A - B = 0.13 (as described in the previous section)

This implies that baseline participants in Dorchester who were following 'normal directions' made, on average, 0.13 fewer driving faults in the trial section than the non-trial section. Therefore to adjust for effects specific to the Dorchester centre all differences in driving faults at Dorchester were reduced by 0.13 as this is the expected baseline change in difficulty between the non-trial and trial sections[9]. This procedure removes the effect of differences in difficulty in non-trial and trial sections. It should also remove the effect of differences in centres, examiners, participants and overall route difficulty.

If we now consider the 'following traffic signs' condition at Dorchester:

D. the average number of driving faults per mile in the non-trial section for baseline participants who 'follow traffic signs' in the trial section is: 0.67
E. the average number of driving faults per mile for these same baseline participants when they follow traffic signs in the trial section is: 0.82
F. the difference in driving faults per mile is: D - E = -0.15

This suggests that baseline participants in Dorchester that were 'following traffic signs' in the trial section made, on average, 0.15 more driving faults in the trial section than the non-trial section. However, the expected difference due to centre specific effects (as calculated from the procedure outlined under bullet points A, B and C) between non-trial and trial sections for Dorchester was 0.13. Therefore the adjusted difference takes this into account by reducing the difference in the 'following signs' condition by 0.13:

[9] Note that this means that the average on the difference variable in the baseline group that was tested under the 'normal directions' condition is zero by definition. All other groups and conditions are relative to this baseline value.

G. the adjusted difference is = F - C = -0.15 - 0.13 = -0.28

Therefore this subgroup (baseline participants 'following traffic signs' in the trial section at Dorchester, in this example) with a mean adjusted difference of -0.28 make, on average, 0.28 more driving faults per mile in the trial section than the non trial section, after normalising for the centre specific effects between the non-trial and trial sections at that centre.

2.3.2 Analysis of qualitative data

The data collected from the interviews was transcribed and analysed using Thematic Content Analysis. Qualitative content analysis involves a process to condense raw data into categories and themes based on inference and interpretation. The transcripts were analysed by the researchers and key themes, findings and exceptional findings were extracted.

2.4 Materials

The following test materials are included in the following appendices:

A. Appendix A contains the consent form signed by participating learner drivers. Learners signed this form if they wished to take part, having had the study explained to them by their ADI.

B. Appendix B contains the candidate selection sheet. This was used by test centre managers to pre-screen learner drivers on arrival at the test centre, so that they could be assigned to the appropriate group ('baseline', 'English not first language', or 'consider themselves to have a disability').

C. Appendix C contains the DL25 form used for collecting fault data from the drive. The left side of the form was used to record faults from the non-trial section, while the right side was used to record faults from the trial section. The version shown here is coded with a pink marker in the top left corner. This colour coding reflects that the form was used for a 'baseline' participant.

D. Appendix D contains the short demographic questionnaire used by test centre managers to collect information from participants after the drive.

E. Appendix E contains the consent form that all participants signed prior to being interviewed.

F. Appendix F contains the interview guide used in the qualitative study.

3 Results (performance data)

3.1 Driving faults

3.1.1 Baseline and non-English participants

Figure 3.1 shows the driving fault performance data for baseline and 'non-English' participants, using the performance measure described in Section 2.3.1. Outliers (i.e. candidates that exhibited extremely high or low levels of performance) were left in the analysis. For driving faults there were no extreme outliers (greater than 3 x inter-quartile[10] range from the mean) and 14 outliers (between 1.5 and 3 x IQR from the mean).

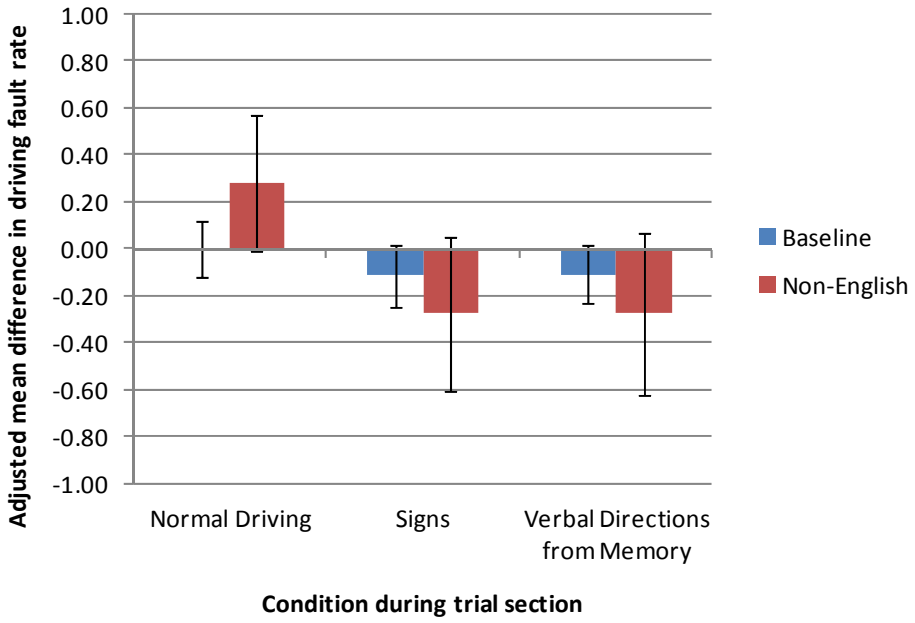

Figure 3.1: Adjusted difference in driving fault rate by candidate type and condition during trial section: data from all seven centres combined (error bars are 95% confidence intervals).

The data were analysed using a two-way between participants ANOVA, with type of candidate ('baseline' or 'non-English') and condition ('normal'; 'verbal directions from memory'; and 'signs') as independent variables. The ANOVA revealed a significant main effect of condition, $F(2,408)=3.65$, $p=0.027$. The main effect of candidate type and the candidate type by condition interaction were both not significant. If the new tasks had been found even more difficult by non-English participants than by baseline participants, we would have expected the interaction between candidate type and condition to be significant. However one other reason why the interaction may not be significant is due to the low numbers of participants in the non-English group. Therefore the data were split by candidate type, and the simple main effect of condition was tested for each group. These analyses revealed that the effect of condition was not significant for the baseline participants, $F(2,359)=1$, $p=0.36$, but significant for the non-English

[10] The inter-quartile range is the difference between the 25th percentile point and the 75th percentile point. Using the inter-quartile range is a standard way of defining the magnitude of outliers in data sets.

participants, F(2,67)=3.32, p=0.042. A post-hoc Tukeys HSD test revealed that the differences between 'normal driving' and the two new tasks were marginally significant (p=0.056 and p=0.089 for the comparisons with 'signs' and 'verbal directions from memory' respectively) for non-English participants. These data are consistent with the interpretation that non-English participants found the new tasks more difficult than baseline participants, but because of the low participant numbers in the non-English group probably leading to insufficient statistical power to detect a significant interaction between candidate type and condition, the results should be treated with caution.

Another factor included in the analysis to check for the effect of test centre on the pattern of data was the interaction between the condition effect and the test centre at which the data were collected. This analysis revealed a significant interaction between condition and test centre, F(18,408)=2.22, p=0.003. This shows that the effect of condition was not the same at all test centres.

Although it was never intended that centre differences would be examined in detail, it is worth considering the different patterns of data at the different centres in relation to the condition effect that is apparent in the non-English data for driving faults. Figure 3.2 shows the driving fault data by centre, for baseline participants.

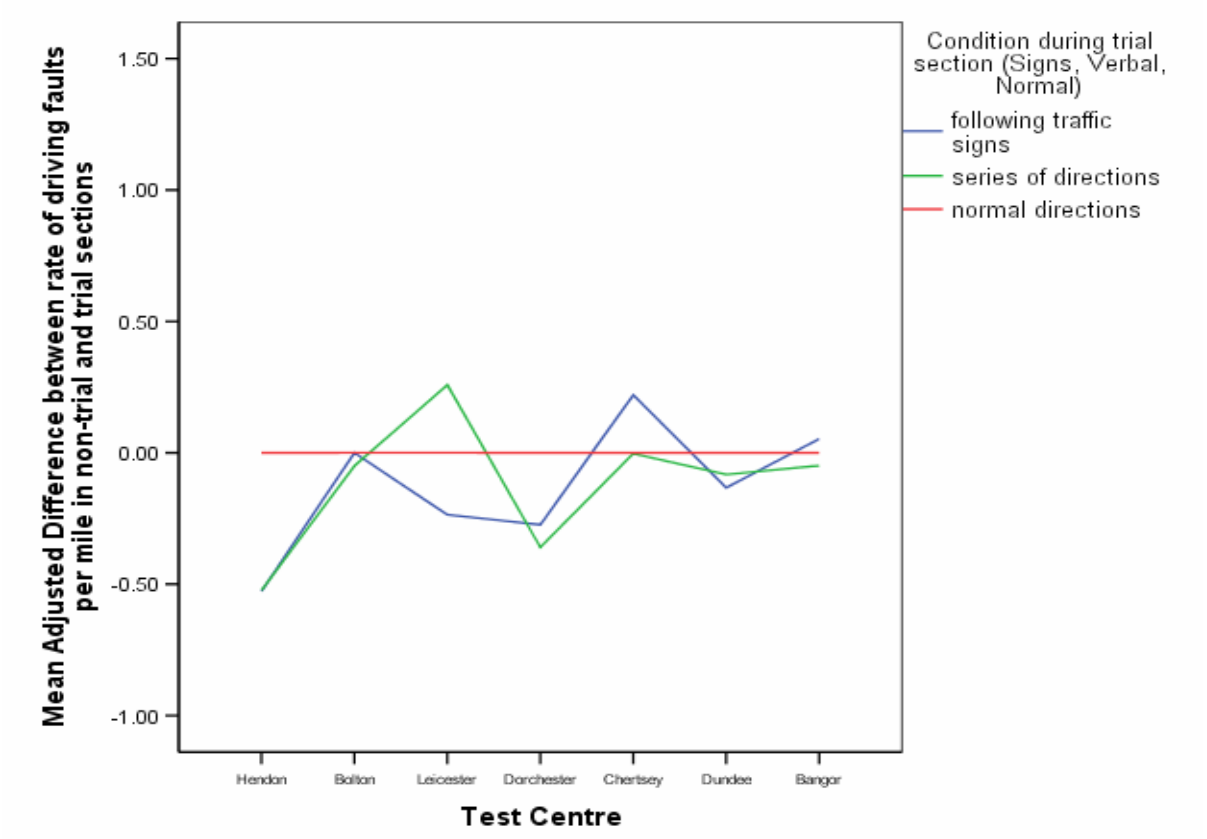

Figure 3.2: Adjusted difference in driving fault rate by condition during trial section: baseline participants, by centre (baseline 'normal driving' group set to zero by correction procedure described in Section 2.3.1.1)

It is noticeable that the effect of condition (i.e. the difference between 'normal driving' and the two independent driving tasks) varies with centre. For example at Bolton and Bangor, there is almost no difference between the conditions. At Leicester and Chertsey there are ambiguous data, in that 'normal driving' appears to be more difficult to one of the independent driving tasks, but easier than the other. Hendon, Dorchester and Dundee however do seem to show effects of difficulty in baseline participants whereby the 'normal driving' is easier than the two independent driving tasks. When the data are

pooled across centres however, the effect of centre for baseline participants is non-significant.

The pattern of data by centre has implications for interpretation of the effect of task difficulty on non-English participants. The data in Figure 3.2 can be taken as a baseline of the task difficulty effect at each centre. Because a much larger proportion of non-English participants (compared to baseline participants) came from Hendon (see Table 2.1), where the effect of condition appears to be largest even for baseline participants, it is possible that the reason why the overall effect of condition is significant in non-English participants is partly due to this confound with centre.

Another way of approaching this issue is to ask whether the effect of condition is significant for baseline participants, and for non-English participants, at Hendon, and at all centres other than Hendon. Table 3.1 shows the means and standard deviations for these data, in addition to the number of participants in each condition for Hendon and for centres other than Hendon.

Table 3.1: Mean (standard deviations) adjusted driving fault rate for baseline and non-English participants at Hendon, and centres other than Hendon

	'Normal driving'	'Following Signs'	'Series of directions from memory'	Significant effect of condition?
Baseline: Hendon	0.00 (0.45) N=14	-0.53 (0.78) N=15	-0.52 (0.58) N=14	Yes p=0.045
Non-English: Hendon	0.42 (0.77) N=8	-0.80 (0.78) N=10	-0.58 (0.91) N=9	Yes p=0.012
Baseline: centres other than Hendon	0.00 (0.70) N=106	-0.06 (0.73) N=105	-0.06 (0.69) N=108	No
Non-English: centres other than Hendon	0.19 (0.59) N=12	0.00 (0.86) N=19	-0.05 (0.67) N=12	No

Table 3.1 shows that the relative difficulty of the new independent driving tasks (normalised for baseline participants as described in Section 2.3.1) is much larger at Hendon for non-English participants, as well as for baseline participants. In addition, when Hendon data are not included in the overall analysis (i.e. pooled across all centres other than Hendon) the effect of task difficulty seen previously in non-English participants is no longer significant.

Unfortunately it is not possible to elucidate this issue fully with the current data set, since this project was never designed to have a scope sufficient to look at centre differences. However, it is possible that the disappearance of the condition effect in non-English participants when Hendon is removed from the analysis is due to the loss of statistical power arising from the lower than planned number of these participants. In the absence of enough participants to run a formal analysis, it is worth considering whether the effect of condition (specifically the increased difficulty in the independent driving tasks apparent in Table 3.1) outside of Hendon would have become significant had the planned number of non-English participants been tested across all centres. By assuming that the variability in the data would stay the same if more participants were tested (this is an untested assumption) it is possible to calculate the number of participants that would have been required to make the difference in means observed statistically significant. For the 'normal' versus 'signs' comparison, had there been 57 non-English participants per condition outside of Hendon, then the difference observed in Table 3.1 would have been significant. Similarly, 126 participants per group would have been required for the 'normal' versus 'verbal directions from memory' difference to have been significant. Thus, had the non-English sample size been comparable to the sample size for baseline participants outside of Hendon, the small differences in difficulty

apparent in Table 3.1 would have become significant for non-English participants. With comparable sample sizes the effect for baseline participants outside of Hendon is still non-significant. Thus the data are consistent with the interpretation that non-English participants, even outside of Hendon, found the new independent driving tasks very slightly more difficult than baseline participants did, even if the insufficient sample size makes it impossible to test this formally, due to a lack of statistical power

3.1.2 Additional analyses

Other factors were included in the model as covariates and found to have no influence on the effect of condition either for baseline participants or for non-English participants. The tested variables were total number of hours of formal training, total number of hours of informal training, number of hours of practising the verbal directions from memory task, number of hours of practising following road signs, gender and age. Thus the new tasks did not have any differential effect on people that varied on these variables.

3.1.3 Candidates who consider themselves to have a disability

It was not possible to carry out a formal analysis of the performance of candidates who reported having a disability, due to the very low number of participants tested and resultant low statistical power. The qualitative data (see Section 4) does provide some information on how these participants found the new tasks.

3.2 Serious and dangerous faults

The measure used and normalisation procedure was the same as for driving faults. No significant differences were found between any of the conditions in any of the groups (all F's <1). As with driving faults, outliers were left in the analysis. There were nine extreme outliers (greater than 3 x interquartile range from the mean) and 19 outliers (between 1.5 and 3 x IQR from the mean). Figure 3.3 shows these data.

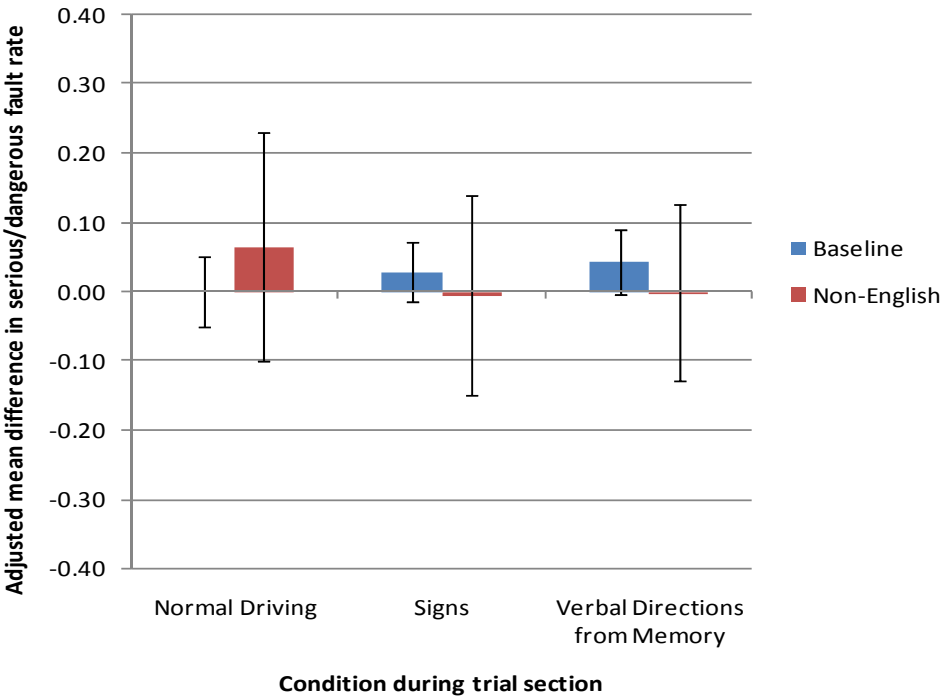

Figure 3.3: Adjusted difference in serious/dangerous fault rate by candidate type and condition during trial section: data from all seven centres combined (error bars are 95% confidence intervals).

4 Results (qualitative data)

The qualitative data gathered during the interviews were used to supplement the performance data, and were used to elucidate perceptions of the new tasks held by minority groups (learner drivers who considered English to be their second language and learner drivers who reported having a disability or special needs). The objective of the qualitative part of the research was to facilitate the understanding of any perceived difficulties with the new tasks to ensure that the potential implementation of independent driving in the GB driving test would not be unfair (or perceived as unfair) to minority groups. The themes and sub-themes elicited are described below.

4.1 Relevance to real driving

Candidates who considered English to be their second language and candidates who reported having a disability felt that the new independent driving tasks were relevant to 'real driving'. These findings corroborate those from Helman et al. (2008). The new tasks were reported to prepare candidates for the challenges of solo driving, i.e. driving without ongoing directional instructions from the examiner or instructor. Candidates felt that the introduction of the independent driving tasks would encourage ADIs to train candidates on "real" driving, rather than to focus driving lessons on passing the test.

> *"It is a very artificial environment when you're being instructed about every single turn, and which exit on the roundabout you're going to be taking. I think that it (the new task) would be a more accurate depiction of how we actually drive."* (Female, European, following road signs)

> *"I think as a learner when you are learning to drive you should be able to follow instructions. If you are going somewhere in a different city you should be able to follow instructions on your own. I think this is one of the most important things because if you can't follow instructions you can't drive."* (Female, Asian, following verbal directions, interview conducted in native language)

> *"I think you do because you are not going to know everywhere. I think it teaches learner drivers to be more responsive. Having to follow road signs puts you in a kind of real driving situation rather than the people sitting next to you telling you where to go."* (Male, dyslexic, following road signs)

A minority of candidates suggested that the following verbal direction task may not be realistic, particularly as the maps used by the examiners as a memory aid were viewed as simplistic. Candidates also indicated that with the popularity of technologies, such as satellite navigation systems, novice drivers would be likely to use these new technologies when travelling to unknown destinations.

> *"It is not realistic; the plans/ diagrams which were shown to me were too simple and show no detail on side street or road name. If I was to research into the direction I need to take before driving to a place, I will most probably remember the road name as well as the number of streets I would pass before making a turn. Secondly, I would use TomTom rather than read a map and memorise directions."* (Female, Chinese, following verbal directions)

4.2 Advantages and Benefits

Candidates from a minority background suggested that following verbal directions and road signs would have a beneficial effect on their later driving. These new tasks allowed candidates to feel more independent and autonomous in their decision-making regarding driving. Many candidates felt that these tasks had the potential to increase their confidence and would encourage them to develop skills for driving solo, such as

multitasking, being more responsible, paying more attention and being less reliant on the instructor.

> *"I think it helped me greatly. Just being out there, being independent, and not having anyone telling you where to go. The trial did give me confidence to know that I could do it myself."* (Male, Asian, Following verbal directions)

Candidates suggested that the introduction of the independent driving tasks would have implications for safety by increasing learners' awareness of signage on the roads and an awareness of other road users.

> *"I think people will start paying more attention to the signs on the roads and understand what they mean. People are more likely to also adhere to speed signs and respect other road markings. And this will mean fewer accidents."* (Female, Asian, following road signs, interview conducted in native language)

> *"…it's necessary for their own safety and the safety of others, the new task should be introduced."* (Female, African, following verbal direction)

4.3 Difficulties and Challenges: Perspectives of participants from a non-native English speaking background

4.3.1 Fluency of language

The majority of non-native English speakers who participated in the trial were able to understand the language and converse fluently in English. Many of them were second generation migrants or people immigrated to the UK at a young age and had been through the English education system. Therefore their command of English was good and they were able to understand the directions given by the examiner in English.

> *"Even though I consider Portuguese to be my first language my English is better than my Portuguese. I think if you speak good English there is no way you would struggle. It is simple words you are following".* (Male, European, Following road sings)

However, these eloquent non-native English speakers suggested that those learners who were less fluent in the English (such as those who may have recently migrated into the country) may find the instructions for the new independent driving tasks more complex and difficult to follow. In addition, they suggested that learner drivers who do not read English or who had difficulties reading English would be unable to complete the following road signs task. Nine interviews were conducted in the participant's native language. These candidates indicated that they had basic English language knowledge and skills. One of these candidates indicated that the new tasks required a greater grasp of the language.

> *"I can say from personal experience that this is different and more difficult than the type of instructions given 'turn left' and 'turn right'. People who do not speak good English are likely to struggle with the new directions".* (Female, Asian, Following road signs, Interview conducted in native language)

> *I can read so it was ok, but if one cannot read English, then they would not be able to do this task."* (Male, Asian, Following road signs, Interview conducted in native language)

Other learners, who did not consider their language skills to be proficient, reported that they were able to understand the instructions given by the examiner and felt that the directions given by the examiner were clear and concise. Some candidates suggested that understanding the briefing took them slightly longer, but also reported that the absence of constant instructions from the examiner during the trial had a positive impact on their driving.

"It did take me a while to fully understand the briefing given to me before I had to carry the task out." (Female, Chinese, Following verbal direction)

4.3.2 The influence of the new tasks on driving

Learner drivers, who were less proficient in English, felt that the added workload of reading or understanding a second language influenced their driving. Many reported that they were likely to drive more slowly and/or to forget instructions resulting in taking wrong turns. Participants attributed the changes in their driving to the additional time required to translate instructions or road signs into their native language prior to carrying out the instructions.

"I can just about read English but it takes me loads of time to do this. My driving would be considerably slower, if I needed to do this task." (Female, Asian, Following road signs, Interview conducted in native language)

"Sometimes to translate English to your language takes time and it makes everything slower, and sometimes when you are nervous you translate to the wrong word. You have to keep English information in your mind, and it is so difficult. Maybe you lose something in the end. It happened for me, for example, after first roundabout, second roundabout, suddenly I forget [what] he said after the directions. If I drive in the normal situation maybe it is not a problem." (Female, Iranian, Following road signs)

4.3.3 Translation during the trial

During some observations of the trial drive, it was noted that a minority of candidates who were not proficient in English depended on their instructors to repeat the direction given by the examiner in their native language to ensure that the candidate had understood the instructions. Although translation needs were apparent in all conditions, this happened particularly frequently in both the following verbal directions and following road signs conditions.

"My instructor had to occasionally translate to clarify instructions. My English is poor and therefore I sometimes get confused." (Male, Asian, Following road signs, Interview conducted in native language,)

Other candidates suggested that they would translate the information presented to them in the verbal direction task, prior to driving and perhaps, write these instructions in their own language.

"It would be easier with an interpreter. I think if I had to do this task (following verbal directions) in real life, I would have written the instructions in my language. My memory is not very good and having to hold additional information was really hard". (Male, Easter European, Following verbal directions)

4.3.4 Unanimous support for the introduction of the new tasks into the driving test

Despite the challenges and difficulties, candidates from a non-English speaking background suggested that these tasks should be introduced in the practical driving test. Speaking, comprehending and reading English were considered essential skills to succeeding in the new task, but also for future driving and living in the UK in general. Participants felt that some appreciation of the language was required to be able to read and follow road signs, which was regarded as an important skill for future driving.

"I think if people are going to live in this country, they need to speak English and they should try to read and speak English by going to college. I don't think it would be necessary to have a translator. A translator is only there for one hour

you are going to have to drive for the rest of their life." (Male, African, Following road signs)

"It's important for the person to read English. But if they cannot read English then it's not possible for them to follow road signs. They won't be able to read the name of the city. Perhaps people, who cannot read English, should wait till they have passed the UK Life exam (ESOL) before taking the driving test. If you want to live in England, then you need to learn some level of English." (Male, Asian, interview conducted in Native language, Following road signs)

4.3.5 Suggestions to ensure that the new test is "culturally appropriate"

Candidates put forward some useful suggestions for ways in which the test could be conducted in a culturally sensitive manner. These included requesting examiners to use simpler language and speaking more slowly.

"The difficult for us is not that we are unable to understand but that we need to translate everything we hear. Therefore, instructions should be given slower and also preferably one at a time. If more than one instruction is given then it's hard to retain the information". (Male, Asian, Following road signs, Interview conducted in native language)

4.4 Difficulties and Challenges: Perspectives of participants who consider themselves to have a disability

Participants with physical disabilities did not consider that their disabilities had an impact on their ability to complete the new independent driving tasks. This contrasts with participants with learning disabilities who suggested that the new tasks may be problematic for them. The problems encountered by participants with learning difficulties (particularly Dyslexia) are summarised in this section. Learner drivers who considered themselves to be dyslexic suggested that learning to drive had been a challenge and that the new tasks would further increase the difficulty of the learning to drive process. Candidates suggested that their dyslexia made it difficult for them to multitask, especially when it involved retaining multiple directions in memory.

"If somebody tried to give me more than one direction, I would not remember them because once I'd heard the first one I'm trying to remember that, I'd probably would either forget or not hear the second." (Female, Dyslexia, Following verbal directions)

Candidates suggested that dyslexia also made it difficult for them to follow sequences of information such as those comprised in verbal directions and following road signs.

"I think I've found learning to drive as a dyslexic person quite hard. Some people think it's about just reading and writing, but it's about sequencing, coordination. As a dyslexic person I have found the new task a bit more of a challenge, and directions, left, right are difficult to remember. As soon as I get nervous then I start to get confused and a bit agitated then the lefts and rights go out the window, unfortunately". (Male, Dyslexia, Following verbal directions)

Learner drivers who considered themselves to have learning difficulty felt that following verbal directions was more challenging than following road signs. Many reported that their attention was diverted from the driving task to remembering the instruction:

"I don't think that I'd be as confident about following a series of directions as I would be about following road signs because of my dyslexia, I think that I'd be more likely to forget the directions, and more specifically, the sequence of directions." (Female, Dyslexic, Following road signs)

Some candidates, who had dyslexia, reported using strategies to assist them in following road signs. These strategies included recognising words, or the first few letters of a word visually, rather than reading the entire name of the destination.

> *"I've got recognisable dyslexia, what it does is that I recognise words but I don't actually read them, which helps me with signs – I look at a word and recognise it and don't waste time reading it. I find my way around things and it works."* (Male, Dyslexic, Following road signs)

4.5 Implications for training

Learner drivers from minority groups recommended that training for the new tasks would be essential and should be introduced when the learner driver was competent with car control skills, confident to drive and test ready. Candidates agreed that the new tasks would require additional lesson time, but they did not anticipate this to be more than 4–5 hours of training with an ADI.

> *"Yes, I think you would have to put more hours in before you went for a test. Learning to drive would take longer. You might as well do it when you are learning to drive because you are going to have to do it anyway".* (Male, Partially blind, Following verbal directions)

Many learners suggested that prior to the trial they had not paid attention to road signs and that the lack of experience with the new task made it more difficult. Participants felt that independent driving tasks required the parallel execution of several tasks and that this multi-tasking increased their workload. Despite the difficulties posed, candidates felt that with practice and the right training they would be competent to successfully master the task.

> *"I did find it hard and I needed to concentrate a bit more. It was a bit confusing because I had never really paid any attention to signs. I can read English slightly, so I could do it, but multi-tasking was hard. I had not done it before so it was hard. But I think it's important to do and with a bit of practice it can be done".* (Male, Asian, Following road signs, Interview conducted in native language)

> *"I had to find the sign, be aware of what was going on around me and make sure I was driving safely. I found it difficult because I was looking for a lot of things. My attention was also divided between being inside the car and outside the car. There was too much going on at the same time".* (Male, Eastern European, Following road signs)

4.6 Implications for assessment

Some candidates reported that being nervous, especially in a test environment would affect their performance.

> *"I was nervous enough when I sat my test before but I think if I had to remember verbal directions and road signs it would make me even more nervous and wouldn't let me drive the way that I normally would".* (Female, Japanese, Following road signs)

> *"I am fifty, fifty. On one hand it is good that you know where to go because that is what you are going to be doing when you pass your test, but on the other hand a lot of people might get really nervous if they are going the wrong way and mess up on a signal or a manoeuvre."* (Male, European, Following road sings)

Candidates commented that being familiar with the area drastically reduced the difficulty of following verbal directions.

"I knew where I was going; I was familiar with the area. As soon as he showed me the map I knew exactly where I was going." (Male, Partially blind, Following verbal directions)

5 Discussion

5.1 Key findings: on-road performance

5.1.1 Driving faults

The current study examined the feasibility of introducing two independent driving tasks (following road signs; and following verbal directions from memory) into GB driver testing. The research questions addressed were:

1. What is the impact of the two independent driving tasks on driving performance, as measured by driving faults and serious/dangerous faults, when compared with 'normal driving'?
2. Does this impact differ for learner drivers who do not consider English to be their first language, or learner drivers who consider that they have a disability?
3. Do learner drivers who do not consider English to be their first language and/or learner drivers who report having a disability hold differing views regarding the new tasks than those held by candidates who do not fall into these categories.

The results showed that there was no significant impact of the two independent driving tasks on the number of driving faults or serious/dangerous faults made when baseline candidates alone were included in the analysis. When candidates who considered English not to be their first language were added to the analysis, a significant effect of task emerged on driving faults, such that the number of driving faults in both independent driving tasks was greater than in 'normal driving'. The same effect was observed when non-English participants were analysed separately.

Unfortunately it is not possible to be sure whether the impact of the independent driving tasks was greater for the non-English group than for the baseline group; the interaction between group and condition was non-significant but this may have been due to low statistical power. As stated above however, the effect of condition was statistically significant in the non-English group, but not in the baseline group, when one-way analyses were carried out on groups separately. This finding is compatible with the conclusion that the non-English candidates found the tasks more difficult than did the baseline participants. **Assuming that the differences observed in the non-English group reflect a genuine effect, the magnitude of the difference is such that on the new independent driving tasks, candidates who considered their first language to be non-English made around one extra driving fault per two miles of exposure to the tasks, over and above what they would be doing during normal driving.**

Not enough data were available from the 'disability' group to permit any conclusions to be drawn regarding performance data.

5.1.2 Serious/dangerous faults

The current study showed that in terms of serious and dangerous faults, there were no differences between conditions for any of the groups. This finding runs counter to the finding from the Phase 1 study, and suggests that when the road/task confound is controlled, the independent driving tasks do not give rise to variations in serious/dangerous faults.

5.1.3 Potential impact of independent driving on driver safety

In the 2008 DSA consultation document ('Learning to drive: a consultation paper'), "…lower numbers of accidents among newly-qualified drivers" is cited as an expected outcome by DSA regarding the various changes being made as part of the consultation (p6).

With regards to the road safety outcome, the introduction of independent driving tasks into the GB practical driving test is based on the premise that this will stimulate training of independent driving which in turn will give learner drivers experience of tasks pre-test that resemble typical post-test driving tasks, thus helping to reduce their crash risk post-test. Although there is no direct evidence to support that this approach will lead to safety increases for new drivers yet, there is a theoretical argument that by making pre-test driving more like post-test driving, some of the safety benefits associated with post-test experience (Mayhew, Simpson & Pak, 2003; Maycock, 2002; Williams, 1999) may be transferred to the pre-test period.

With this theoretical argument as a backdrop, it is worth considering the mechanisms that are thought to underlie the safety benefits that have been shown to accompany post-test driving experience. Groeger (2006) has reported that the data on crash risk and driving experience follow a power law—characterised by rapid increases in skill (or, in this case, rapid drops in accidents) early in the learning period and a steadily reducing rate of improvement as experience is gained. This pattern of learning is similar to that seen in a wide range of human activities involving skill acquisition, and Groeger (2006) also discusses how such data can be explained quite readily by fundamental theories of skill acquisition such as the 'instance theory of automaticity' put forward by Logan (1988). In Logan's theory, performance in a given skill progresses from a reliance on slow effortful problem-solving processes early on in learning to reliance on automatic retrieval of past instances of experience from memory later on. Importantly, improvement in any skill is only possible if experience is gained so that instances of past performance can be added to memory for later retrieval. While other models of skill learning posit slightly different mechanisms (e.g. Anderson, 1983) there is broad agreement that experience with a task leads to a decreasing rate of skill improvement as experience is gained[11].

What amount of experience is needed by drivers before they begin to show large reductions in accident liability? Maycock (2002) reports two studies showing that crash risk is highest in the first six months of licensure; the fact that one in five young drivers in the UK is involved in an accident of some kind within their first six months of driving is also mentioned specifically in the 2008 DSA consultation paper. In terms of mileage, there seems to be some agreement that the first 500–1000 miles of post-test exposure are the most important. McCart, Shabanova and Leaf (2003) for example showed that the risk of first crash for teenage drivers in a US sample was highest in the first 500 miles of driving. Evidence of changes in the way in which the driving task is actually processed with early experience is provided by Kinnear, Kelly, Stradling and Thompson (2009). These authors showed that after inexperienced drivers gain 1000 miles of post-test experience, they begin to show similar emotional responses (measured via skin conductance) to developing road hazards in video-clips as do experienced drivers (those with three or more years of post-test driving).

It is unlikely that the new independent driving tasks capture all that is relevant about post-test driving; many other differences exist between pre- and post-test driving, such as carrying passengers, driving at night, and using distraction-inducing devices such as mobile phones when driving. Even if the new tasks did mimic post-test experience

[11] Graduated licensing schemes—which have been shown to reduce the crash risk of novice drivers (e.g. Williams, 2007)—also work on the basis of encouraging learners to build up what Christie (2001) refers to as an 'experience bank' of driving. However, graduated licensing achieves this through reducing the risk associated with post-test driving by limiting high-risk activities such as carrying young passengers, and night-time driving, thus allowing this experience bank to be built up in lower-risk driving conditions.

perfectly, it is highly unlikely that the equivalent of 500 to 1000 miles of independent driving experience will be achievable within the 47 hours (average) of formal training that candidates take before passing their test (Wells et al, 2008). Despite this, maximising the pre-test driving experience must be an important aim. In order that the independent driving tasks to have the best possible impact that they can on road safety, it will be important for approved driving instructors (ADIs) to give as much opportunity as possible to candidates to practise driving independently. Regarding independent driving as 'one more thing to be learned to pass the test', possibly through rote learning of test routes, will undermine the mechanism by which independent driving might be expected to have its crash-risk reducing effect. There will also be a clear role for informal driver training with friends and family—it will be important that learner drivers are given every opportunity during their pre-test driving to drive independently.

5.1.4 Limitations of analysis of on-road performance data

The data in the current study are a statistically robust test of the effect of the new tasks on baseline participants, in the setting studied (i.e. a wide range of test centres across the UK); baseline participants did not find the new tasks more difficult than 'normal driving'. Despite low participant numbers in the non-English group, these participants (when analysed in isolation) did have more driving faults in the new tasks than in the normal driving condition. However, there are insufficient data from participants who report having a disability to be sure what the impact will be on this group in terms of on-road performance. The data are consistent with the interpretation that this group find the new tasks more difficult than the baseline participants do, but these data should be treated with extreme caution given the low participant numbers.

A possible reason for the differences between the findings in baseline participants in this study and in the Phase 1 study is that examiners in both studies may have adopted different criteria for awarding faults during the new tasks. The fact that the pattern of driving faults across the new tasks differed with test centre in the current study is consistent with this interpretation.

5.2 Key findings: qualitative data

The qualitative findings were used to elucidate the perceptions of the new independent driving tasks from learner drivers who do not consider English to be their first language, or learner drivers who report having a disability. In particular, the research aimed to answer the question whether learner drivers from minority groups hold differing views on new tasks than baseline candidates.

The results suggest that participants from minority groups (non-native English speaking participants and participants who consider themselves to have a disability) considered the new independent driving tasks to be more challenging than normal driving. However there was widespread acceptance of the new tasks and unanimous support for introducing them into the driver training and assessment protocol.

Candidates who considered themselves to be less fluent in English felt that the instructions for the new tasks were complex and difficult to follow. Many learners reported that they directly translated instructions into their native language during the trial. They felt that reading or understanding instructions in another language increased their workload and influenced their driving, i.e. resulting in driving more slowly, misunderstanding instructions or forgetting directions and consequently taking wrong turns during the trial. Candidates often relied on their instructors to translate during the trial. Some suggested that the "following verbal directions" task was not "realistic", as they would be more likely to write down the directions in their native language when asking a bystander for verbal directions in real life.

Candidates with learning disabilities also reported that the independent driving tasks were more challenging than the current driving test. These candidates felt that they had difficulties multitasking and following a series of directions. Remembering a series of directions in the "following verbal direction" task diverted their attention from the driving task. Candidates perceived the "following verbal directions" task to be more difficult than the "following road signs task.

Despite the difficulties and challenges candidates recognised the importance and relevance of these new tasks to "real driving" (driving they would do after passing the test) and were positive that, given the appropriate training and practice, they would be able to perform the new tasks.

Candidates felt that the training for the new tasks would not significantly increase the number of lessons they were required to take. Many estimated that four to five hours of additional training with an ADI would be adequate to prepare them for the new tasks. Candidates also thought that repeated practice and familiarity with test routes would undermine the true "independent" nature of the task.

5.2.1 Potential impact of independent driving on face validity and acceptance of the GB driving test

Another expected outcome of the changes proposed in the 2008 DSA consultation document ('Learning to drive: a consultation paper') is "…higher levels of learner satisfaction that they have acquired the skills needed to drive safely" (p6). The independent driving exercises were perceived as relevant to 'real driving' by learner drivers from minority and disability groups[12]. Perceived benefits include greater autonomy in decision making, giving a flavour of and preparing for solo driving. The introduction of the new elements to driver training and testing was regarded as imperative to ensure that candidates' driving competencies were sufficiently developed and automated to function reliably in situations where the driver's attention is focused on other goals such as following road signs. Thus, if introduced, acceptance is likely to be high. However, attempts must be made to ensure that the instructions presented and training for the new tasks are culturally appropriate. Finally, participants' views indicate that if the independent driving tasks are regarded as a mere "test hurdle" that needs to be overcome, this is likely to undermine the real relevance of the task. Thus as when considering the safety benefits of the new tasks, if the new tasks are to raise the face validity of the driving test it will be crucial to ensure that learner drivers have a deep understanding of the issues involved in independent driving, and that they have extensive practice in independent driving during their pre-test driving

5.2.2 Limitations of qualitative data analysis

The findings suggest that participants who were less fluent in English (those that required a translator) were more likely to find the independent driving tasks challenging and difficult. However, only nine participants in the current sample met this criterion. Similarly, there were only 13 participants with a disability interviewed. Statements from the two participants who had a physical disability indicated that they did not find the new tasks more challenging. The small number of participants who considered themselves disabled makes it difficult to draw any firm conclusions. However, the current study points out important difficulties and challenges that minority groups are likely to face if the independent driving tasks are included in the GB practical driving test.

Another limitation of the qualitative data is that the participants in the study were self-selecting, and therefore more likely to show positive attitudes towards the new tasks given their enthusiasm. However the findings from this study, and from the baseline participants interviewed in Helman et al. (2008), do make sense in the context of previous work on driver attitudes toward pre-test and post-test driving (e.g. Christmas,

[12] Helman et al. (2008) have already established that 'baseline' participants share this perception.

2007). Further evaluation work on how drivers perceive the new tasks when they encounter them 'for real' as part of their driver training will be needed to assess whether the positive attitudes observed in this study, and in Helman et al. (2008) are still observed with 'live' implementation of the independent driving in the GB driver test.

6 Recommendations

In light of the findings from the current study, the following recommendations are made:

1. The independent driving tasks trialled in this study should be introduced into GB driver testing, so that training of independent driving is stimulated.
2. The effectiveness of the introduction of independent driving in terms of accident reductions for newly qualified drivers needs to be evaluated. In particular, the accident risk of novice drivers who have been exposed to the new tasks as part of their driver training and testing, and new drivers who have not been exposed to the new tasks should be investigated.
3. Alongside the evaluation of effectiveness in terms of accident risk it will be important to ensure that Approved Driving Instructors (ADIs) train the independent driving tasks as intended. The argument that pre-test independent driving will reduce accident rates post-test rests on the assumption that they expose learner drivers to tasks that are typical of post-test driving as part of their pre-test learning. However, this assumption is only valid if ADIs train the tasks as intended. If ADIs adopt an approach based on optimising test-passing by training specific test routes, this may undermine any potential road safety benefits of the new exercises. DSA could take a lead on this issue by developing a guidance document or training for ADIs to maximise the potential safety benefits of the new tasks. This will also have the benefit of ensuring that the new tasks cover the 'awareness of risk increasing factors' and 'self evaluation' columns of the GDE matrix (see Figure 1.1 in main report).
4. Evaluation of the extent to which post-test drivers feel that the new tasks have equipped them with the skills they need to drive safely should be carried out. This should involve the study of satisfaction levels in novice drivers who have been exposed to the new tasks as part of their actual driver training and testing, to see if the perceptions of the new tasks held by learner drivers in the current study, and in Helman, Vandrevala and Hutchins (2008) still hold post-test.
5. It is important that potential difficulties that may be faced by minority groups such as those whose first language is not English are taken into account in the implementation of the new tasks. Materials should be developed to aid the explanation of the new tasks in test situations. The instructions provided to introduce the new tasks need to be 'culturally appropriate' and presented in a culturally sensitive manner. Additional research on the ways in which instructions could be given to participants with a learning disability should be conducted.
6. Further research to investigate ways to explain the 'following verbal directions' task to participants would be beneficial in designing new training and preparation materials for this task.
7. It will be useful to understand whether different driving examiners adopt different criteria in awarding faults in the new tasks, as this may also have an impact on the introduction of the new independent driving tasks. A study looking at examiner and centre differences should address this issue.

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Appendix A Consent form

ID.		Test centre.	

Independent Driving Study
Consent Form

I, the undersigned, voluntarily agree to take part in the study on Independent Driving.

I have read and understood the Information Sheet provided. I have been given the opportunity to ask questions on all aspects of the study and have understood the advice and information given as a result.

I understand that all personal data relating to volunteers is held and processed in the strictest confidence, and in accordance with the Data Protection Act (1998). I agree that I will not seek to restrict the use of the results of the study on the understanding that my anonymity is preserved.

I understand that I am free to withdraw from the study at any time without needing to justify my decision and without prejudice.

I confirm that I have read and understood the above and freely consent to participating in this study.

Name of volunteer (BLOCK CAPITALS) .....
Signed .....
Date .....

Name of person taking consent (BLOCK CAPITALS).....
Signed .....
Date .....

Payment for taking part

For taking part in the current study, you will receive a cheque payment to cover the cost of a single practical driving test fee. In order for us to be able to send you this payment, please fill in the details of who you would like to receive payment below:

Name .....

Address .....

.....

Telephone .....

PLEASE TURN OVER

Participation in future studies: OPTIONAL

TRL is running focus groups and interviews with some learner drivers who have taken part in the study. Those people who take part will be paid an additional £35 for either a 2 hour focus group or a 1 hour interview. In these focus groups or interviews you will simply be invited to discuss your opinions of the things you did in the study.

If you are happy to be contacted to take part in these focus groups or interviews, please fill in the short section below:

I am content for DSA or TRL to contact me again to take part in a focus group or interview regarding this study (without commitment).

Please tick to confirm ☐

Contact details

Name …….

Address …….

…….

Telephone …….

Email …….

Other details:

If English is not your first language, please state your first language.

…….

Do you require an interpreter if the focus group or interview were to be carried out in English? **Yes / No** (delete as appropriate)

Appendix B Candidate pack selection sheet

Test procedure for candidates taking part in the DSA feasibility study on independent driving

This sheet details exactly which steps take place when a candidate arrives for testing in the feasibility study on independent driving. Please ensure that the steps outlined below are followed word for word with each candidate. This ensures that all candidates have the same experience. Of course if the candidate does not speak English, all of the following will be read to the interpreter, who will relay it to the candidate.

Greet candidate and after checking their licence and other relevant paperwork, say the following word for word:

> **"First I will ask you some short questions to which you can answer 'YES' or 'NO'. I need to do this so I can make sure that you carry out the correct driving task later on."**

Then ask these questions in order, noting the candidate's answers as you go:

1. **"Is your first language English? – Please answer YES or NO".**

2. **"The Disability Discrimination Act defines a person as disabled if 'they have a physical or mental impairment which has a substantial and long term adverse affect on their ability to carry out normal day-to-day activities.' Using this definition, do you consider yourself to have a disability? – Please answer YES or NO".**

3. **"Do you consider yourself to have any special educational needs? – Please answer YES or NO".**

If the candidate answers 'YES' to Question 1 but 'NO' to Questions 2 AND 3 then you need to use a **PINK** candidate pack.

If the candidate answers 'NO' to all of these questions, then you will need to use a **YELLOW** candidate pack.

If the candidate answers 'YES' to either of the last two questions, regardless of their answer to the first question, then you will need to use a **GREEN** candidate pack.

Q1	Q2	Q3	Pack
YES	**NO**	**NO**	Give **PINK** Pack
NO	**NO**	**NO**	Give **YELLOW** Pack
Any other combination			Give **GREEN** Pack

Continued overleaf...

Take the appropriate candidate pack and give the candidate the consent form inside for them to sign (if they have not brought one with them) and the questionnaire inside to fill in. Say:

> **"Before we go driving, I need you to sign this consent form, and complete this short questionnaire. Please ask if you are not sure how to answer any of the questions."**

After the candidate has completed the consent form and questionnaire, say the following:

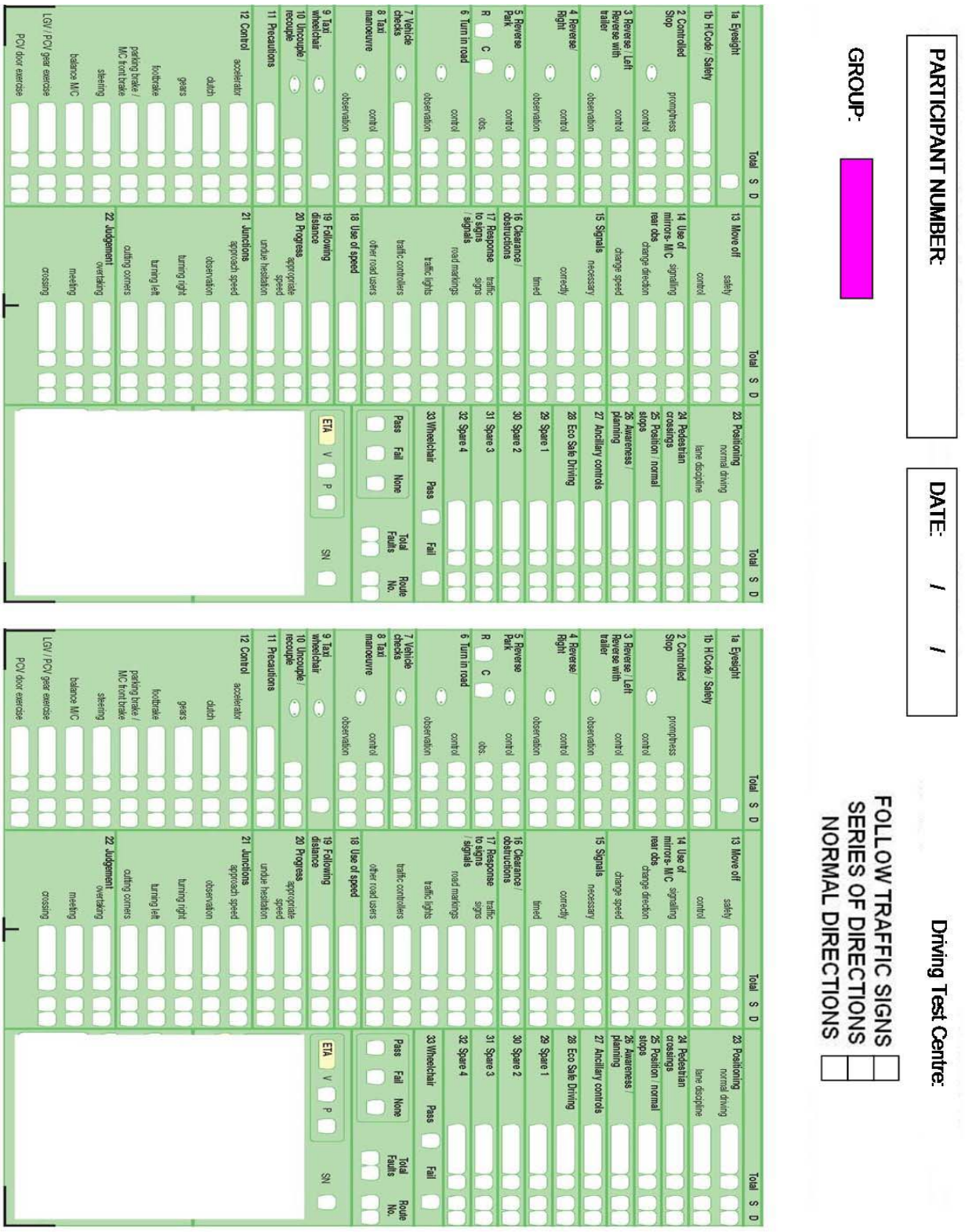
> **"Thank you. Now I will take you on the drive."**

Take the DL25 form from the candidate pack—this is the form you will use on the drive. From this point on, you should follow the standard instructions given to you by the DSA team in the folders you received at the Cardington briefing. Key points to note during the drive:

1. It is ESSENTIAL that you 'tot up' ALL faults made during the drive—EVEN SERIOUS and DANGEROUS ones. DO NOT stop coding just because you think "If this were a real test, this candidate would have failed".

2. Please keep a note of anything out of the ordinary that happens on the drive and whether it happened before, during, or after the trial section. This information may be useful when the data are analysed later on.

Appendix C DL25 form used on drive to record faults



Appendix D Short demographic questionnaire

ID.		Test centre.	

Independent driving

Learner Drivers questionnaire

Thank you for taking part in the study on independent driving. Before you begin the actual drive, there are some details we would like you to provide. This information will help us to understand how different people find the new independent driving tasks.

To complete the questionnaire, please fill in answers to the questions included. Please try to complete all questions if possible. However if you find yourself unable to answer any particular question, just move on to the next one.

Everything you write on this short questionnaire is **completely confidential**—we never indicate your name in any outputs of this study.

Please fill in questions 1 to 15 below.

1 How old were you on your last birthday?

_____ years old

2 Are you:

Male ☐

Female ☐

3 Is English or Welsh your first language?

Yes—English ☐

Yes—Welsh ☐

No ☐

4 If English is not your first language, how confident do you feel about your ability to speak English? On a scale of 1 to 5, where 1 is 'not at all confident' and 5 is 'extremely confident'.

Not at all confident	1	2	3	4	5	Extremely confident
	☐	☐	☐	☐	☐	

5	Which one of the following best describes your ethnic background?			
	Any white background	☐	Asian and white background	☐
	Black African and white background	☐	Any other mixed ethnic background	☐
	Bangladeshi	☐	Indian	☐
	Pakistani	☐	Any other Asian background	☐
	African	☐	Caribbean	☐
	Any other black background	☐	Any Chinese background	☐
	Arab	☐	Any other ethnic background	☐
	Gypsy/ Irish or Scottish Traveller	☐	Don't know	☐

6	Using the following Disability Discrimination Act definition, do you consider yourself to have a disability? **The Disability Discrimination Act defines a person as disabled if; "they have a physical or mental impairment which has a substantial and long term adverse affect on their ability to carry out normal day-to-day activities."**		
	Yes	☐	If 'Yes', how would you describe your disability? _____
	No	☐	_____
	Don't know	☐	_____

7	Do you consider yourself to have any special educational needs?		
	Yes	☐	If 'Yes', how would you describe these needs? _____
	No	☐	_____
	Don't know	☐	_____

8	When did you start to learn to drive?
	_____ (approximate date)

9	Since starting to learn, how many hours of driving lessons per week (with a driving instructor) have you had?
	_____ hours

10	Since starting to learn, how many hours of driving practice per week (with friends and family) have you had?
	_____ hours

11	Approximately what percentage of your driving lessons and practice has been in urban (town) and rural (country) areas?
	_____% urban
	_____% rural

12	Have you taken your driving theory test?				
	Yes	☐	→ **IF YES: Did you pass?**	Yes	☐
				No	☐
	No	☐	→ **IF NO: When do you expect to take it?**	Within 1 month	☐
				1–3 months	☐
				3–6 months	☐
				Later than 6 months	☐

13	How many previous attempts have you had at your driving practical test?
	_____ previous attempts

14	When do you expect to take your first/next driving practical test?	
	Within 1 month	☐
	1–3 months	☐
	3–6 months	☐
	Later than 6 months	☐

15	Have you practised either of the new tasks ('following verbal directions from memory' and 'following road signs') being trialled by DSA in this study, before today?				
	Yes	☐	→ **IF YES: Which task?**	Following Verbal directions ☐	**For how long?** _____Hours
				Following Signs ☐	**For how long?** _____Hours
	No	☐			

Thank you for your time!

Appendix E Consent form for Qualitative study

ID.		Test centre.	

Independent Driving Study – Qualitative Study

Consent Form

I, the undersigned, voluntarily agree to take part in the study on Independent Driving.

I have been given the opportunity to ask questions on all aspects of the study and have understood the advice and information given as a result.

I understand that all personal data relating to volunteers is held and processed in the strictest confidence, and in accordance with the Data Protection Act (1998). I agree that I will not seek to restrict the use of the results of the study on the understanding that my anonymity is preserved.

I understand that I am free to withdraw from the study at any time without needing to justify my decision and without prejudice.

I confirm that I have read and understood the above and freely consent to participating in this study.

Name of volunteer (BLOCK CAPITALS) .....
Signed .....
Date .....

Name of person taking consent (BLOCK CAPITALS).....
Signed .....
Date .....

Appendix F Interview guide

Feasibility – Interview Guide

Introduction

Thank you for agreeing to participate in this Interview. We are interested in your views on the "independent driving" task you did in the trial you completed. During the drive you were asked to drive while

'Following verbal direction from memory' – this is when the examiner asked you to follow a number of verbal directions OR

'Following road signs' – this is when the examiner asked you to follow road signs to a particular location.

We are interested to know more about what you thought about this task.

The discussion should last about 1/2 hours. We would like to record this discussion. This will make it easier for us to concentrate on what you say. All records will be destroyed at the end of the project and only anonymised findings will be included in the report. Do you have any objections to the interview being recorded?

Rapport Building and being a learner driver

1. What has been the biggest challenge for you while learning to drive?
2. What do you think will be the biggest challenge when making the change from learner driver to driving after you have passed your test?

Your experience with the independent driving task
(Either following direction signs or following verbal direction)

3. What did you think of the trial?
4. What did you like most about the exercise? *Why?*
5. What did you dislike most about the exercise? *Why?*
6. What would the benefits be for learner drivers?
7. What are your thoughts about DSA including this exercise in the practical driving test?

   Prompt: How would you feel if this exercise became part of the driving test in the future?
   Why would you feel this way?

Challenges with the independent driving task

8. How easy or difficult did you find this task?

9. What made it easy for you?

10. What made it difficult for you?

11. What problems would you anticipate if this new task was incorporated into the existing test?

12. Can you think of any potential barriers to introducing this exercise into the driving test?

13. What do you think that DSA could do to reduce the difficulties they had experienced with the task?

Relevance to "real driving"

14. What is the relevance of this exercise to 'real' driving?

15. Do you think introducing the exercises included in this trial will make the transition from accompanied learner to independent driver any easier?
Prompt: In what ways will it make the transition easier? Why do you think so?

Social Inclusion Issues

DSA is particularly keen to ensure that all groups of people can effectively do this task and therefore it is particularly keen to hear the views of minority groups, including those who may not consider English as their first language or drivers who consider themselves to have a disability.

Non-English speaking participants

16. Were there any particular challenges in doing this task for you as a non- native English speaker?

17. In what ways was this task challenging or difficult for you as a non-native English speaker?

18. Why did you find this task difficult?
Prompt: What makes it difficult?
Language barriers, translation, cultural issues

19. Is there anything that can be done to encourage candidates who do not consider English as their first language to master the skills that are required to complete this task?

Prompt: How could they be overcome?

Participants who consider themselves to have Special Needs or Disabilities

20. In what way was this task particularly difficult for you with regards to your special needs?

21. Why did you find this task difficult?
Prompt – difficulty in understanding instructions, difficulty and more time in learning how to do the task?

22. Is there anything that can be done to encourage candidates who consider themselves to have a disability to master the skills that are required to complete this task?

Training and Preparation

23. What training and preparation did you have for this exercise?
Prompt: In what way did your instructor help you prepare for this exercise?

24. Have you done anything similar to this task in your driving lessons?
Prompt: If so, please give details.

25. If this task would be introduced into the driving test in the future, how do you think it should be taught to learner drivers?

26. Do you think that the learning needs would be different for people from minority groups, such as people who do not consider English to be their first language or people who consider themselves to have a disability?

    Prompt: In what way? What should be done?

Do you have any further questions or comments about the trial?

Thank you very much for your time.

Appendix G Independent driving tasks - qualitative follow-up study report

G1. Introduction

The Driving Standards Agency DSA recently commissioned a series of research studies investigating the feasibility of introducing independent driving exercises into the practical driving test (Helman *et al.,* 2009; Helman & Vandrevala, 2009). This research initially involved trialling three tasks for possible inclusion in the GB practical driving test, however, following the first pilot study (Helman *et al.*, 2009) this was reduced to two tasks. The two tasks now being proposed for inclusion in the GB practical driving test are 'following road signs' and 'following verbal directions from memory'. In the former task, learner drivers are required to follow road signs for a period of time. In the latter, they are required to follow directions from memory, as if they had stopped and asked for directions.

Helman *et al.* (2009) found that participants reported practical barriers to introducing the independent driving exercises in training and testing. These included the need for additional training time dedicated to the new elements, possible over-reliance on memory in the 'following verbal directions' task and difficulties for non-native speakers and learners with learning difficulties, particularly on the 'following verbal directions' task. Helman and Vandrevala (2009) expanded on this work by exploring the feasibility of introducing the new tasks when considering participants who either did not consider English to be their first language, or who considered themselves to have a disability. As in Helman *et al.* (2009), the majority of participants reported that they felt that the tasks were challenging, but that they would be relevant for post-licence driving.

This report presents findings from the final part of the feasibility research programme. It explored whether the positive views participants had regarding the new tasks matched their actual post-licence experience. Focus groups were used to evaluate the extent to which a small sample of post-licence drivers who had taken part in the Helman and Vandrevala (2009) study still felt that the new tasks would have equipped them with the skills they need to drive safely post-licence, if the tasks had been part of their pre-licence driver training and testing.

The focus group aimed to address the following research questions:

1. Did those individuals who had passed their practical driving test feel that the independent driving tasks were relevant to post-licence driving?
2. What other independent experiences had they come across in their post-licence driving that they would have liked to have experienced as part of their training and testing?

G2. Method

G.2.1 Sample and recruitment

Two focus groups were run with participants who had taken part in the trial reported in Helman and Vandrevala (2009). The focus groups were held at the Hendon and Leicester Test Centres. Participants were selected on the basis of having previously signed a consent form agreeing to participate in future work.

The Leicester focus group had six participants (f=3, m=3, mean age =22 years). Five out of the six had passed their practical driving test since participating in the trial. The Hendon focus group had seven participants (f=5, m=2, mean age =29 years). Five out of the seven had passed their practical driving test since participating in the trials.

G.2.2 Focus group guide

The following topic areas structured the discussion from which themes were drawn:

- What independent driving is
- How driving in the real world differs from driving as a learner
- How relevant the trial tasks were to 'real world' driving
- Perceptions of the tasks
- How trial participation made participants think about their approach to learning to drive
- Overall usefulness of the tasks
- New drivers' own experiences of situations where independent driving can assist new drivers
- Skills needed to keep new drivers safe on the roads
- Additional training areas

The following themes mapped on to those identified in Helman and Vandrevala (2009) and are discussed in Section G.3.1.

- Confidence
- Multi-tasking
- Responsibility
- Independence

Additional themes were identified through discussions with participants in this study, and are discussed in Section G.4.1:

- Motorway driving
- Night driving
- Town driving
- Planning
- Emergency vehicles
- Potential for overconfidence

A copy of the topic guide around which discussions were formed can be seen at the end of this Appendix.

G.2.3 Analysis

The focus groups were recorded using Digital Voice Recorders (DVRs). The recordings were transcribed and analysed using Content Analysis (see e.g. Neuendorff, 2002). Qualitative content analysis involved condensing raw data into categories and themes based on inference and interpretation. Following good practice guidelines to ensure that the qualitative data were explored exhaustively, two researchers coded the data, comparing themes and sub-themes on a regular basis to ensure that any new themes emerging from the data were captured.

G3. Results

G.3.1 Support for findings from previous research

Helman *et al.* (2009) and Helman and Vandrevala (2009) found that participants believed that following verbal directions and road signs would have a beneficial effect on later driving. Interview data showed that participants thought that the two tasks made them feel more independent and autonomous in their decision-making regarding driving. Many participants also felt that these tasks had the potential to increase their confidence and would encourage them to develop skills for driving solo, such as multitasking, being more responsible, paying more attention and being less reliant on the instructor. This section presents data showing that new drivers, who have actual post-licence driving experience having passed their test, share these views.

G.3.1.1 Independence

When describing post-licence driving, participants felt that it was very different to the type of driving that they had experienced as learners. The effect of actually driving on their own without the presence of an instructor or accompanying driver was frequently reported as the biggest difference between pre- and post-licence driving.

"You have to drive with more caution, because obviously with your instructor there you always know that you've got that safety barrier. But when you're driving on your own, you're your own responsibility."

Female, 20 years old, post-licence driver

"When you're on your own, you do have to be aware, a lot more than when you're with an instructor…I think that it takes a lot of getting used to, I found that it took me about two to four weeks to get confident on my own. As soon as you pass, it's like that's it- you're on your own, and there is no time to kind of adjust and get prepared for it."

Male, 17 years old, post-licence driver

G.3.1.2 Confidence

New drivers reported that their participation in the trial reported by Helman and Vandrevala (2009) helped to alleviate their fears regarding their 'real' driving test.

"I was quite nervous to begin with, but while I was doing it, when I enjoyed it and when it finished, I felt more confident, and it felt like that I learnt more things after."

Female, 17 years old, learner

Additionally, those participants who had passed their practical test felt that their participation in the trial increased their confidence both while they were learning to drive and after passing their test.

"I feel more confident now, because before, I used to… the first thing I used to do is get the A to Z out and look at it and think, oh what if I get lost and all that. Now I think, no, okay; go by instinct, but read the signs. But it makes you do that."

Female, 48 years old, post-licence driver

G.3.1.3 Multi-tasking

One of the themes that emerged from discussion about the tasks was that they forced candidates to multi-task in ways that they had not experienced before, but that they would experience as part of their post-licence driving.

"I see why (it would be) hard to follow instructions, because not only do you have to keep an eye out for everything else, but you have to also know where you're going. So if you're not used to the area, it's extra difficult; it'd be quite easy to get lost. Once you realise that you got lost, you'd get even more nervous and then think you're more likely to get into accidents."

Female, 24 years old, learner

Participants felt that independent driving exercises required the parallel execution of several tasks and that this multi-tasking increased their workload as highlighted in the quotes below. None of the participants acknowledged that increased workload was something that affected them as post-licence drivers.

"I actually found it really difficult because not only was I focusing on my handling of the car, I now had a second task of, you know, looking out for the road signs. So I actually did find it quite difficult as a learner driver."

Female, 20 years old, post-licence driver

"I found it difficult, as I also had to remember when manoeuvring as well as remembering what directions I had to go in from the map they showed me. I nearly crashed when I did it… Because I was trying to remember the map he'd shown me, and I forgot to look at me blind spot."

Male, 24 years old, post-licence driver

G.3.1.4 Responsibility

Responsibility was another theme that emerged from the group discussions. Participants described not only being responsible for their own actions, but also demonstrated that their actions affected other people's safety.

"You become responsible for your own self more and everything and everyone you need to look out for out there."

Female, 55 years old, post-licence driver

"You're actually 100% responsible for your actions."

Male, 24 years old, post-licence driver

G4. Evaluation of the tasks and their relevance to real world driving

This section describes participants' views of how the tasks worked in terms of how realistic and useful it was in preparing them for independent driving. It was felt that generally, the tasks did help in preparing for post-licence driving.

"It gave you experience of driving on your own really, because when they tell you to either follow the road signs or give you directions, that's it, you're basically on your own, so it's a little taste of what it's going to be like when you've passed."

Female, 17 years old, post-licence driver

It was also felt that despite being challenging, the tasks were a good idea.

"It's a bit like too much pressure all at once for a learner driver, but it is a good thing because it sets you out for (driving in) the real world."

Female, 17 years old, post-licence driver

Views tended to vary regarding how relevant the tasks were perceived to be in relation to post-licence driving. The split generally seemed to be that following signs was relevant, while following a series of directions from memory was less so. In terms of use

of signs, participants highlighted that this was a particularly useful skill to have when driving in unfamiliar areas.

"Massively, massively relevant really. You know that… you need to be able to follow road signs to get from A to B; otherwise you know, you're kind of lost really."

Female, 20 years old, post-licence driver

"It just gives you confidences that you know you can do it, you can read the signs and get to the point where you're supposed to go."

Female, 48 years old, post-licence driver

With regard to the following verbal directions task, it was felt that the concept was good because there would be situations where drivers get lost, but that the structure of the task was not necessarily how participants in real world situations would follow directions. One participant reported that he had been shown a hand-drawn map and had a series of directions given to him. He felt that he would have preferred to have been shown a 'real map' (for example, an A–Z). When asked what he does when driving in an unfamiliar area, he explained that he tends to use a satellite navigation system. Other members of the group added that they had experience of using satellite navigation systems, or often travelled with other people in the car who would act as navigators. One participant explained that satellite navigation systems act in the same way as instructors, by telling drivers directions one at a time.

"Just before you do it, the (satellite navigation system) will tell you. But before I got the (satellite navigation system), I had to plan, and remember directions, especially when you're planning a journey you haven't done before"

Male, 17 years old, post-licence driver

Participants also stressed the importance of ADIs training learners how to undertake the tasks so that they were adequately prepared for the practical driving test should the tasks be included. It was felt that this preparation was essential and should be introduced into driving lessons when the learner driver was competent with car control skills, confident to drive and test ready.

"Once you become a driver, you need to be able to follow a series of directions, so it should be something that is taught before, to prepare you, as a driver. Some people actually just pass on luck and occasionally you do actually get lost. That means they're not actually ready to go out and be a driver, they're actually putting a lot of people's lives at risk."

Female, 20 years old, post-licence driver

Linked in with this, the importance of gaining pre-licence driving experience was raised by a number of participants.

"Put in more hours, a lot of people are actually trying to scrimp and save because (learning) is quite expensive, which I understand, but a lot of people go in for their test (when they're not ready) not realising that each time it costs them about £150."

Male, 17 years old, post-licence driver

The discussion surrounding pre-licence experience led to some conversation around the notion of having a minimum amount of time set for the pre-licence period. However, this was rejected by all participants on the grounds that everyone would learn at different rates.

G.4.1 Lessons learned by new drivers through their post-licence driving

The participants who had passed their driving tests discussed new types of independent driving that they had discovered in their post-licence driving, and these will be discussed here.

Motorway driving was the only type of driving that participants had not been permitted to do as learners. Participants reported that this was particularly 'scary' as they were required to master joining and exiting motorways independently, as well as travelling at speeds they had never experienced as learners. Information about motorway driving was sourced from a variety of areas, one participant had taken the Pass Plus course and was taught motorway lessons, while another participant sought advice from his mother.

"I was really nervous doing it. It's scary at first to be honest with you. Because the highest speed I'd learnt to drive on was 30mph, maybe 40. I asked my mum about it, she told me that the right-hand lane's for overtaking, don't drive too fast and be careful."

Male, 24 years old, post-licence driver

A number of participants reported that they had not experienced much, if any, night driving in their lessons, and so felt that driving in the dark added extra workload. Similarly with town driving, if participants were from rural locations, they would not necessarily have experienced driving in heavy traffic.

A number of participants felt that journey planning was a skill that had developed considerably during their post-licence driving and was useful in keeping new drivers and other road users as safe as possible because it meant that even if they were going to unfamiliar areas, they were prepared for the situations that they might face there.

Participants reported that one aspect of driving that they wish had been covered in learning to drive was that of making way for emergency service vehicles, as they panicked when it happened to them as part of their real-world driving experience.

"An ambulance with its sirens on, I had one yesterday and I absolutely freaked out, so I just went to the side and just stayed there and let them go around me. It does freak you out if you've never done it before."

Female, 18 years old, post-licence driver

"After I passed, a week later a police car came behind me, and I'm like what do I do now? It's an awkward thing, you don't know what to do, you just stop, what shall I do? Shall I move, shall I not? Shall I stay here?"

Male, 18 years old, post-licence driver

Overconfidence when reaching post-licence driving was also mentioned, with participants reporting being excited about driving independently and pushing themselves to explore their capabilities. The view below was shared by a number of others in the group.

"You tend to feel more confident, you get over confident. I'm actually putting myself in a lot more dangerous situations than normal because I'm over-excited about kind of doing it on my own."

Female, 20 years old, post-licence driver

It was felt that the independent driving tasks are useful tools for bringing together what was learned in the theory test, as well as what was learned in the practical driving lessons.

"It does pull the theory and the practical together, I must admit, before I did the trial, I was just following instructions all the time, I wasn't actually thinking, I wasn't actually looking at the signs or whatever."

Female, 48 years old, post-licence driver

Despite participation in the trials, one participant raised the idea that the learning process continues after passing the practical test, a notion which was supported by the other participants in the group.

"I feel that once you've passed, the learning continues as you go along, which is what I'm experiencing now."

Female, 55 years old, post-licence driver

G5. Summary and conclusions

This study formed the final part of a feasibility research programme, exploring new drivers' perceptions of proposed independent driving tasks for the GB practical driving test. Focus groups were used to evaluate the extent to which new drivers feel that their experience of the 'following verbal directions from memory' or 'following road signs' tasks equipped them with the skills they needed to drive safely post-licence.

The findings from this study demonstrate support for the ways in which experience with independent driving tasks might influence post-licence driving. Previous research (Helman *et al.* 2009 and Helman & Vandrevala, 2009) found that trial participants anticipated that pre-licence experience of the 'following verbal directions from memory' and 'following road signs' tasks would have a beneficial effect on later driving. The follow-up data gathered in this study showed that while participants thought that the tasks were challenging, having completed them, participants felt more independent and autonomous in their decision-making regarding driving. Many participants also felt that these tasks increased their confidence and had encouraged development of independent driving skills, such as multitasking, being more responsible, paying more attention and being less reliant on their instructor.

The 'following road signs' task was considered to be particularly useful because it increased confidence and prepared new drivers with a tool for navigating, particularly in unfamiliar areas. It was felt that the concept of 'following a series of verbal directions from memory' was good because there would be situations in which drivers get lost when they begin driving post-licence. However, participants reported that the structure of the task was not necessarily authentic, in that drivers rarely hold verbal directions in memory and are more likely to write them down, or rely on navigation devices such as satellite navigation.

As found in Helman *et al.* 2009 and Helman and Vandrevala (2009), participants felt that the tasks would be a beneficial addition to the current UK practical driving test, provided that they were incorporated properly into the learning to drive syllabus to ensure that learners are fully prepared for their test. Interestingly, participants in this study felt that their participation in the trial reported by Helman and Vandrevala (2009) had made them more confident regarding their 'real' driving test. It is entirely possible that this boost in confidence arose due to the new independent driving tasks, although we cannot rule out the possibility that participants simply benefited from a general 'extra practice' effect.

Participants also mentioned that they can feel overconfident when beginning their post-licence driving. This observation has been made many times in the literature on new drivers. It is possible that by giving learner drivers some experience of driving independently pre-licence may exacerbate this problem by raising confidence levels. However it may also be possible to ensure good calibration of confidence and skill levels (see Kuiken & Twisk, 2001) by exposing participants to such tasks.

Several other post-licence driving experiences were mentioned by respondents as being good examples of ways in which pre- and post-licence driving differ. These included motorway driving, town driving, dealing with emergency service vehicles and driving in

the dark. The inclusion of town driving in this list is interesting in light of recent research findings from Sexton and Grayson (2009), who have shown using data from the Cohort II study (Wells et al., 2008) that those novice drivers with some pre-licence experience in busy town centres seem to be less prone to having road collisions in their post-licence driving. The proposed introduction of the independent driving tasks into the practical driving test is built on the observation that post-licence experience is associated with large drops in collision risk, and therefore making pre-licence driving more like post-licence driving should help to reduce collision risk among new drivers (Helman & Vandrevala, 2009; see also Helman, Grayson & Parkes, In Press). Therefore it would be valuable to consider other ways in which independent driving could be tested (and trained) using 'real-world' tasks such as the ones suggested by participants in this study.

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G7. Focus group topic guide questions for DSA independent driving follow-on work

Background

Thank you for agreeing to take part in this discussion group on the introduction of independent driving into the driver training and on road assessment.

The discussion we are about to undertake with you will take just over an hour and we shall ask you to talk about the driving that you've done since you took part in the trial.

Ground Rules

- There are no right or wrong answers-only your opinions.
- Even if your view is different from that of others in the group, we still want to hear what you have to say. You are speaking for many other people like yourself
- We need to hear from everyone.
- Only one person talking at a time please. No side discussions in case we miss some important comments.
- It is not important that everyone agrees. However, if you disagree, please allow the other person to finish speaking before you make your point. .
- We need to cover a series of topics, so we will need to move the discussion along at times.

To make sure we capture what you say, we would like to record the discussion with your permission. The recording will be used for research purposes only and will be destroyed at the end of the project. Only researchers at TRL will be listening to this tape. All you say will be treated as confidential and findings will be anonymised when reported.

[Confirm that you have the permission to record and start recording].

INDEPENDENT DRIVING

Introduction:

During the driving trial, you were asked to:

1. follow direction signs, or
2. follow a series of directions given by the examiner

I am now going to go round the table and ask you to tell me your name and say a little about what you remember of your experience of the independent driving trial you took part in.

1. **How would you describe "independent driving"?**

2. **(Passers only) Now that you have had a chance to experience driving 'for real' after passing your test, what has been you experience of how it compares to 'learning to drive'?** (This question gives people a chance to offer their unprompted opinions of how pre-licence and post-licence driving differs)

3. **(Passers only) Now that you have had a chance to experience driving 'for real' after passing your test, how relevant do you feel that the tasks were**

to this 'real driving'? (This question moves to addressing the tasks themselves, but still at a high level)

4. **How did your experience with the tasks make you think about your approach to learning to drive after taking part in the trial?**

Prompts (themes from original report):

- *confidence,*
- *skills,*
- *your interaction with your driving instructor,*
- *the approach taken by your driving instructor,*
- *changes to what you paid attention to when learning.*

5. **(Passers only) How did your experience with the tasks affect how you approached your post-test driving?** *Prompts (themes from original report):*
    - *confidence,*
    - *skills,*
    - *responsibility,*
    - *independence.*

6. **What is your overall impression of the usefulness of the tasks in terms of preparing you for driving 'for real'?** (This question allows us to return to the key topic area of 'relevance to real driving' and elicit more opinions, in light of the more detailed discussion that has just occurred)

Prompts?

7. **Which 'independent driving' tasks/situations have you come across in your independent driving that could be introduced to further assist in helping new drivers being driving 'for real'?**

E.g. multi-storey car parks/motorways/any other new tasks

8. **What can newly qualified drivers do to be safer drivers?**
9. **What skills do newly qualified drivers still need to develop after they have passed the driving test if they are going to be able to keep themselves and other road users as safe as possible?**

Which of these will you find most challenging?

10. **What additional training do you think you would need to become competent at driving independently?**
11. **What other experiences do you think are necessary to fully prepare you for later solo driving?**

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