



# SCOOTSMARTER

Evaluation Report

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## About this report

This report summarises the results from an evaluation of the ScootSmarter intervention, which was conducted using both an intervention and control group on Prolific. Data collection occurred across three time points: T1 and T2 were collected in October 2024, and T3 was collected in December 2024, approximately 8–10 weeks after T1 and T2.

The ScootSmarter intervention design and evaluation was completed by [Co-Pilot](#). The intervention is now available to Co-Pilot members for use and is also available for purchase using the Co-Pilot [Supermarket](#).

For more information on the ScootSmarter intervention, please visit the [ScootSmarter Film](#).

## Funding and acknowledgements

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## Disclaimer

This report has been prepared by Dr Elizabeth Box who is a Behavioural Science Consultant at Co-Pilot. It has benefited from independent peer review. Responsibility for the final content, including any errors or omissions, rests solely with the author. The views expressed in this report are those of the author and do not necessarily reflect those of the reviewers.

## About the author

**Dr Elizabeth Box** is Co-Pilot's Behavioural Science Consultant. She is an accomplished transport researcher and commissioner with over two decades of experience influencing and contributing to road safety policy outcomes at the national level.

Elizabeth's doctorate in Transport Psychology focused on [developing and trialling pre-driver education interventions grounded in behavioural science](#), with the resulting intervention receiving a [Prince Michael International Road Safety Award in 2023](#). On completing her doctoral studies Elizabeth founded ECM Research Solutions Ltd to provide consultancy services to public and private sector clients to support the development of high-quality evidence-based public safety interventions.

In addition to being Director of ECM Research Solutions Ltd and Co-Pilot's Behavioural Science Consultant, [Elizabeth holds several other roles in the field of transport safety](#). Elizabeth is an advisor to a number of road safety industry and government project boards and is a judge for the Prince Michael International Road Safety Awards. She is also a Fellow of the Chartered Institute of Highways and Transportation, a technical champion for the organisation as well as a judge for the Institute's annual Road Safety Award.

## Contents

|                                                            |    |
|------------------------------------------------------------|----|
| About this report .....                                    | 1  |
| Funding and acknowledgements .....                         | 1  |
| Disclaimer .....                                           | 1  |
| About the author .....                                     | 2  |
| Executive summary .....                                    | 5  |
| 1.0 Introduction .....                                     | 6  |
| 2.0 Method .....                                           | 6  |
| 2.1 ScootSmarter .....                                     | 6  |
| 2.2 Participants and Recruitment.....                      | 7  |
| 2.3 Survey Measures .....                                  | 8  |
| 2.3.1 Screening criteria and participant recruitment ..... | 9  |
| 2.3.2 Survey content and coding .....                      | 9  |
| 2.3.3 Data preparation and analysis .....                  | 9  |
| 2.4 Data Analysis .....                                    | 10 |
| 2.4.1 Baseline comparability.....                          | 10 |
| 2.4.2 Knowledge analyses.....                              | 10 |
| 2.4.3 Behavioural determinants .....                       | 10 |
| 2.4.4 Perceived intervention impact .....                  | 10 |
| 2.4.5 Supplementary analyses .....                         | 11 |
| 3.0 Results .....                                          | 11 |
| 3.1 Descriptives .....                                     | 11 |
| 3.1.1 Group comparability and response checks .....        | 12 |
| 3.2 ScootSmarter outcome evaluation results.....           | 12 |
| 3.2.1 Knowledge.....                                       | 13 |
| 3.2.2 Behavioural determinants .....                       | 15 |
| 3.3 ScootSmarter process evaluation results .....          | 18 |
| 3.3.1 Cognitive impact.....                                | 18 |
| 3.3.2 Emotional engagement .....                           | 19 |
| 3.3.3 Face validity.....                                   | 20 |
| 4.0 Discussion .....                                       | 22 |
| 4.1 Knowledge gains.....                                   | 22 |
| 4.2 Behavioural determinants .....                         | 22 |
| 4.3 Perceived impact and engagement.....                   | 23 |
| 4.4 Limitations and implications .....                     | 23 |
| 5.0 Conclusions.....                                       | 23 |

|     |                                                  |    |
|-----|--------------------------------------------------|----|
| 6.0 | References.....                                  | 24 |
|     | Annex A: ScootSmarter Intervention Plan .....    | 25 |
|     | Annex B: Consent Form .....                      | 28 |
|     | Annex C: Survey Questions.....                   | 29 |
|     | Annex D: Baseline and response comparisons ..... | 31 |

## List of Figures

|                                                                                                                                                                        |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 2-1: Measurement sessions for ScootSmarter evaluation.....                                                                                                      | 8  |
| Figure 3-1: Changes in correct knowledge of the minimum legal age for e-scooter use over time by study group .....                                                     | 13 |
| Figure 3-2: Correct identification of licensing requirements for e-scooter use over time by study group.....                                                           | 14 |
| Figure 3-3: Correct identification of rules governing e-scooter use over time by study group ....                                                                      | 15 |
| Figure 3-4: Attitudes to e-scooter use on public roads by study group.....                                                                                             | 16 |
| Figure 3-5: Intentions to use e-scooters on public roads by study group .....                                                                                          | 17 |
| Figure 3-6: Perceived behavioural control for following e-scooter rules by study group .....                                                                           | 17 |
| Figure 3-7: Social norms associated with e-scooter use by study group .....                                                                                            | 18 |
| Figure 3-8: Composite measure of perceived cognitive impact (credibility, usefulness, importance, informativeness) by study group .....                                | 19 |
| Figure 3-9: Mean emotional engagement ratings (enjoyable/boring composite) by condition. Higher scores reflect greater enjoyment and engagement with the material..... | 20 |
| Figure 3-10: Composite measure of perceived face validity (benefit, insight, and willingness to share) by study group .....                                            | 21 |

## List of Tables

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Table 3-1: Descriptive statistics of participants in the ScootSmarter evaluation ..... | 11 |
| D1. Intervention group: Responders vs. Non-responders ( $n = 83$ ) .....               | 31 |
| D2. Control group: Responders vs. non-responders ( $n = 72$ ).....                     | 31 |
| D3. Responders only: Intervention vs control ( $n = 112$ ).....                        | 32 |

## Executive summary

This evaluation examined whether a short clip from the ScootSmarter educational film improves young adults' understanding of UK e-scooter regulations and influences psychological factors linked to safe and legal riding. Using a controlled pre-post design with follow-up, participants aged 18–30 were allocated to either the ScootSmarter clip (intervention) or a matched Highway Code clip (active control). Surveys were completed before viewing (T1), immediately after (T2), and 8–10 weeks later (T3), assessing knowledge of key rules and Theory of Planned Behaviour constructs, alongside perceptions of the films themselves.

Participants who watched the ScootSmarter clip showed significantly better understanding of e-scooter riding rules than those in the control group immediately after viewing, with this advantage largely maintained at follow-up. Some knowledge gains, however, were short-lived: awareness of the minimum legal age increased sharply post-exposure but returned to baseline by follow-up, and knowledge of the licensing requirement did not change over time. Behavioural determinants showed limited change, with no meaningful differences over time, nor between those who watched ScootSmarter and those who viewed the comparison film. Perceived behavioural control reduced briefly immediately after viewing ScootSmarter before improving again by follow-up. This pattern may reflect increased awareness of the complexity of current e-scooter regulations; however, it could also indicate a temporary reduction in perceived ability to navigate or comply with the rules, which may have implications for individuals' confidence in enacting legal riding behaviour.

Participants rated ScootSmarter as more emotionally engaging than the control film. Perceived face validity was similar across groups. Open-text feedback portrayed the film as clear, concise, professional, and easy to understand, with a suggestion that presenting key facts earlier could enhance engagement.

These results indicate that information provision can effectively address important knowledge gaps, particularly around riding rules, and that ScootSmarter is both credible and engaging. However, consistent with wider behavioural science and road safety research, knowledge alone did not shift deeper motivational or normative factors. As such, ScootSmarter is best positioned as part of a broader educational approach that reinforces messages and supports the translation of knowledge into practice.

The study's scope, using short clips rather than full films, an 8–10 week follow-up period, and small baseline group differences, may have limited the extent of change observed in behavioural determinants.

Overall, ScootSmarter demonstrates value as an engaging, credible educational resource that improves understanding of key e-scooter rules and raises awareness of legal requirements. Although this study did not demonstrate direct effects on behavioural determinants, the film strengthens understanding of key legal requirements that underpin safer e-scooter use. When combined with reinforcement strategies and broader educational or enforcement initiatives, ScootSmarter has meaningful potential to support legal and responsible e-scooter riding in the UK.

# 1.0 Introduction

The evaluation of the ScootSmarter intervention outlined in this report assessed the effectiveness of ScootSmarter in providing potential users with information about rules for e-scooter usage (private and public trials) and encouraging them to commit to using e-scooters in legal situations only. The sections that follow outline the methodology, recruitment process, survey questions, data analysis, and the evaluation results. A discussion of these results, conclusions and implications for future developments of the intervention is also outlined.

## 2.0 Method

### 2.1 ScootSmarter

ScootSmarter is a c.10 minute video which covers four key topics related to e-scooters: Knowing the law and rules around e-scooter use; How to maintain your e-scooter; How to protect yourself; and Good practice riding skills. The intervention aims to improve knowledge, attitudes and intentions related to safe e-scooter usage through providing e-scooter users with information about rules for e-scooter usage (private and public trials) and encouraging them to commit to using e-scooters in legal situations only.

| Segment                                | Purpose                                                                                               |
|----------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Watch This First</b>                |                                                                                                       |
| Buying an E-Scooter                    | Highlights the ease of purchasing an e-scooter but introduces legal restrictions on usage.            |
| Illegal Usage Areas                    | Clarifies where e-scooters cannot be ridden, emphasising the law.                                     |
| E-Scooter Trials                       | Explains e-scooter trials and their rules in select UK cities.                                        |
| Legal Requirements                     | Lists conditions for trial scooter use, including age and speed limits.                               |
| Private vs. Public Use                 | Explains private property use rules and consequences for illegal riding.                              |
| <b>Maintenance</b>                     |                                                                                                       |
| Safety Tips: Maintenance and Ownership | Provides tips on maintaining e-scooter safety, focusing on weekly checks and safe charging practices. |
| Hiring Safety Checks                   | Outlines checks for hired scooters, ensuring they are safe to ride.                                   |
| <b>Protection</b>                      |                                                                                                       |
| Protection and Visibility              | Stresses importance of wearing helmets and protective gear for visibility and safety.                 |
| <b>Riding Skills</b>                   |                                                                                                       |
| Rising skills                          | Provides six key riding tips, including speed control and avoiding distraction.                       |
| <b>The Law</b>                         |                                                                                                       |
| Law and Consequences                   | Explains legal issues and consequences of illegal e-scooter use                                       |

The full intervention plan for ScootSmarter can be found in Annex A.

## 2.2 Participants and Recruitment

The ScootSmarter evaluation was conducted as a controlled pre-post evaluation with an additional follow-up survey. Data were collected across three time points (T1, T2 and T3) using [Prolific](#), an online platform used to recruit diverse, high-quality participants for research.

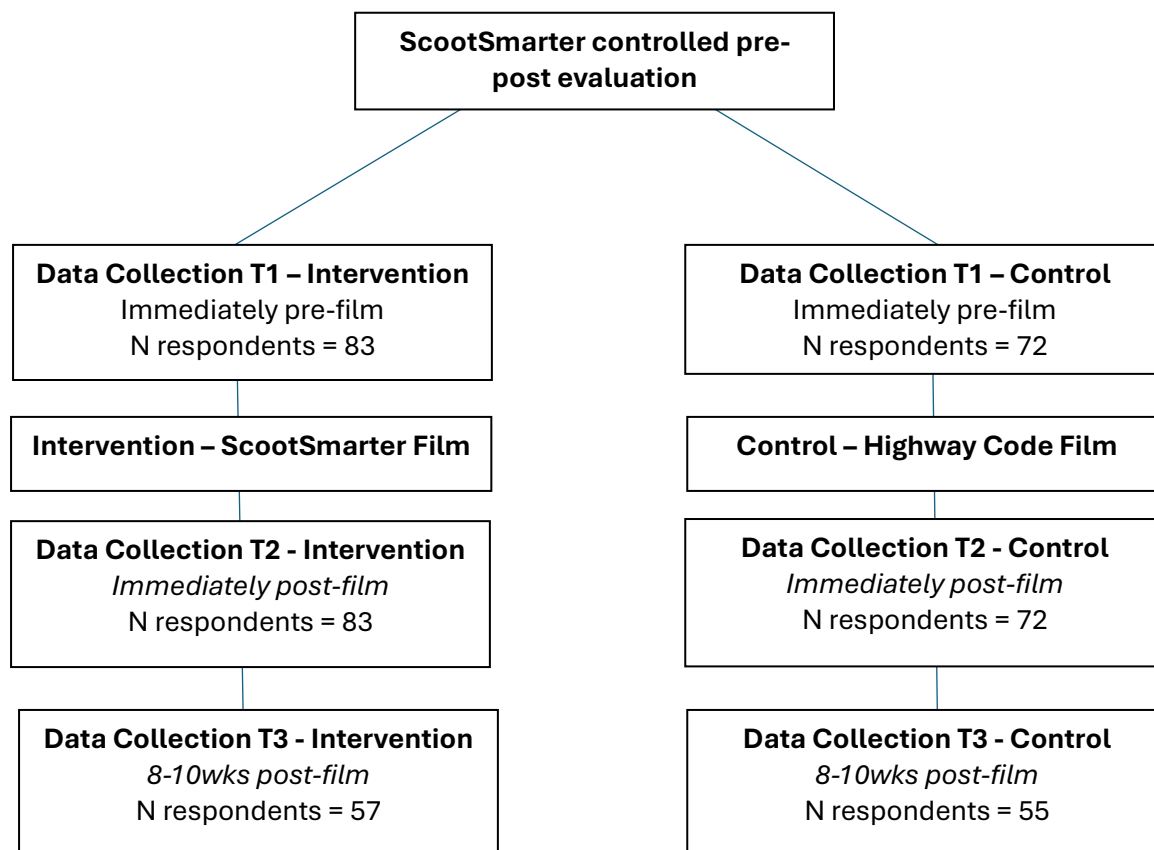
Participants were allocated to one of two groups:

- **Intervention:** Pre-survey (T1), approximately 2-minute film clip from the ScootSmarter intervention, immediate post-survey (T2), and follow-up survey 8–10 weeks later (T3).
- **Control (Active):** Pre-survey (T1), approximately 2-minute film clip on the Highway Code changes, immediate post-survey (T2), and follow-up survey 8–10 weeks later (T3).

Given the constraints of online experimental research and the need to minimise participant fatigue and attrition across three survey waves, a short segment of approximately two minutes was selected rather than the full 10-minute film. The segment used was the opening “Watch This First” section, which provides an overview of the legal framework and key riding rules. This section was chosen because it presents the core informational content in a concise format and reflects a realistic exposure scenario in which viewers may engage with only part of the film. The two-minute duration also allowed the intervention and control films to be matched for length, ensuring comparability between conditions. The aim was therefore to test whether brief exposure to the core rule-based content could influence knowledge and related psychological determinants.

Figure 2-1 illustrates the structure of the measurement sessions conducted for this evaluation, outlining the timeline and sequence of assessments. Each group participated in pre- and post-intervention surveys, with the intervention group viewing the ScootSmarter video and the control group viewing a Highway Code clip. This approach allowed for a controlled comparison of knowledge, attitudes, and behavioural intentions regarding legal e-scooter use, based on exposure to the intervention.

**Figure 2-1: Measurement sessions for ScootSmarter evaluation**



## 2.3 Survey Measures

The evaluation of the ScootSmarter intervention involved three survey time points (T1, T2, and T3), administered before, immediately after, and approximately 8-10 weeks following participants' exposure to either a c.2 minute [ScootSmarter intervention video clip](#) (Intervention condition) or a c.2 minute [Highway Code film clip](#) (active control condition).

The T1 pre-survey collected baseline data on participants' knowledge, attitudes, and intentions related to e-scooter use. The T2 post-survey, administered immediately after video exposure, assessed immediate changes in these variables to evaluate the short-term impact of the intervention. The T3 follow-up survey assessed the sustainability of these changes over time. Data collection was conducted between October and December 2024.

The inclusion of an active control condition (a short [Cycling UK video](#) explaining recent Highway Code changes) ensured that any observed differences between groups could be attributed specifically to the ScootSmarter intervention's content and messaging, rather than to general exposure or survey effects. The control video (2 minutes 47 seconds) outlined four 2022 Highway Code updates: the hierarchy of road users, safe passing distances for cyclists, junction priority rules, and the "Dutch Reach" method for preventing dooring incidents. While road safety-related, the video did not include content on e-scooter regulations. The duration of the clip was closely matched to the ScootSmarter segment to ensure comparability of exposure across conditions.

Each survey session was designed to last approximately 8 minutes, with brief, targeted questions enabling direct comparison between the intervention and control groups across time points. Participant IDs were used to link responses longitudinally across all three waves.

Full details of the survey measures are provided in Annex C.

### 2.3.1 Screening criteria and participant recruitment

To ensure a representative sample, participants were recruited through Prolific and screened for the following criteria:

- **Survey participation:** Exclusion of those who had recently completed one of the two surveys on offer (i.e. intervention or control) to avoid repeat taking.
- **Age range:** Only participants aged 18-30 were included, as this age range represents a core demographic for e-scooter usage.
- **Residency:** Participants were required to be current residents of the United Kingdom.
- **Licence Status:** Only participants holding a provisional or full driver's licence were eligible, to ensure familiarity with road use and related regulations.

Participants received a nominal payment for their time (£2.25 per response), as per Prolific's guidelines, with compensation levels set between 10p and 65p depending on response time for those responses that were screened out. Upon starting the survey, participants were asked to provide their Prolific ID, enabling payment processing and demographic data matching. A consent form was provided at the start of the survey (See Annex B).

Participants who completed both the T1 and T2 surveys were invited to take part in the T3 follow-up survey approximately 8-10 weeks after the initial intervention. Invitations were issued through the Prolific platform to maintain continuity across survey waves and ensure linkage of responses via participant IDs.

### 2.3.2 Survey content and coding

The surveys included items to assess participants' e-scooter ownership, experience with e-scooter trials, knowledge of regulations, and behavioural intentions and attitudes towards legal e-scooter usage. Questions were also included to evaluate perceived ease of legal e-scooter use in the UK, along with cognitive impact measures assessing participants' perceived usefulness and anticipated benefits of the intervention (face validity).

To ensure responses aligned with a safety-conscious perspective, items related to attitudes (ATT), intentions (INT), perceived behavioural control (PBC), and subjective norms (SNORM) were coded such that lower scores indicated more safety-supportive responses. This coding approach was applied uniformly across all relevant survey items, facilitating consistent interpretation of effects and alignment with the intervention's goals of promoting legal, responsible e-scooter use.

### 2.3.3 Data preparation and analysis

All survey data were managed and analysed in SPSS. Data wrangling steps included verifying response validity, coding responses to reflect safety attitudes, and handling missing data where applicable. No formal a priori power analysis was conducted. The target sample size (approximately 70 participants per condition at baseline) was determined pragmatically, based on feasibility considerations and consistency with similar controlled online experimental studies examining short educational interventions. With all data prepared, statistical analyses were conducted to assess the effectiveness of the intervention in changing participants' knowledge and behavioural perceptions compared to the control group. Further details on survey items and coding specifics are available in Annex C.

## 2.4 Data Analysis

A series of statistical analyses were conducted to evaluate the effectiveness of the ScootSmarter intervention in improving knowledge, attitudes, intentions, and perceptions related to legal e-scooter use in the UK. Analyses also examined the perceived cognitive, emotional, and face validity impacts of the intervention compared with the control film (Highway Code). All analyses were conducted using IBM SPSS Statistics (Version 29), with the level of statistical significance set at  $p < .05$ . Effect sizes ( $\eta^2$  for ANOVA and  $d$  for  $t$ -tests) are reported to indicate the magnitude of observed effects.

### 2.4.1 Baseline comparability

Prior to conducting outcome analyses, chi-square tests were used to assess baseline equivalence between the intervention and control groups across key demographic variables (gender, ethnicity, driving licence status, student status, and employment status). An independent-samples  $t$ -test was used to compare mean age between groups. These checks ensured that any post-intervention differences could be more confidently attributed to the intervention rather than pre-existing group differences.

### 2.4.2 Knowledge analyses

To assess changes in knowledge of e-scooter regulations (minimum legal age, licensing requirements, and riding rules), a series of 3 (Time: T1, T2, T3)  $\times$  2 (Condition: Intervention, Control) mixed ANOVAs were performed, controlling for gender. This approach allowed for the examination of both main effects of time (overall change) and interaction effects (differential change between groups). McNemar's test was also used to confirm within-group shifts in the proportion of correct responses from pre- to post-intervention for key knowledge items.

### 2.4.3 Behavioural determinants

To evaluate the intervention's influence on behavioural determinants, additional 3  $\times$  2 mixed ANOVAs were conducted on participants' attitudes (ATT), intentions (INT), perceived behavioural control (PBC), and subjective norms (SNORM) toward e-scooter use on public roads. Lower scores were coded to indicate more road-safety-supportive responses, reflecting the intervention's objective of encouraging lawful and responsible riding behaviours. These analyses examined both time effects (changes across T1, T2, and T3) and Condition  $\times$  Time interactions to identify whether the intervention group demonstrated greater improvements compared with the control group.

### 2.4.4 Perceived intervention impact

To explore participants' perceptions of the intervention content itself, independent-samples  $t$ -tests were conducted comparing the intervention and control films across three domains:

- **Cognitive impact** (credibility, usefulness, importance, informativeness)
- **Emotional engagement** (enjoyable, reverse-coded boring)
- **Face validity** (benefit, insight, willingness to share)

Composite scores for each domain were calculated using mean item responses, and reliability analyses (Cronbach's  $\alpha$ ) were performed to assess internal consistency prior to analysis. Effect sizes ( $d$ ) were computed to estimate the practical significance of differences between groups.

## 2.4.5 Supplementary analyses

Descriptive analyses were used to characterise participant demographics, scooter use history, and response rates at each measurement time point (T1, T2, T3). These analyses helped identify potential sources of bias (e.g., attrition effects) and supported interpretation of outcome differences.

## 3.0 Results

This section presents the findings from the ScootSmarter intervention evaluation. It begins with an overview of participant characteristics and baseline comparability to ensure that observed effects can be attributed to the intervention rather than group differences. Subsequent sections report on changes in knowledge, attitudes, intentions, and perceived behavioural control (PBC) across three measurement points (T1–T3), comparing the intervention and control groups. Analyses then examine participants' perceptions of the intervention content, including its cognitive impact, emotional engagement, and face validity, to provide insight into how the materials were received. Together, these findings offer a comprehensive assessment of the effectiveness and perception of the ScootSmarter intervention.

### 3.1 Descriptives

To establish a foundation for evaluating the impact of the ScootSmarter intervention, descriptive statistics were first analysed to understand the demographic and background characteristics of participants in both the intervention and control groups. This preliminary analysis ensures that any observed differences in outcomes can be attributed more confidently to the intervention itself, rather than to variations in group composition.

**Table 3-1: Descriptive statistics of participants in the ScootSmarter evaluation**

|                   |                             | Intervention group |              | Control group |              |
|-------------------|-----------------------------|--------------------|--------------|---------------|--------------|
|                   |                             | T1&T2              | T1, T2 & T3  | T1&T2         | T1, T2 & T3  |
| N participants    |                             | 83                 | 57           | 72            | 55           |
| Age (SE)          |                             | 25.33 (.385)       | 25.60 (.468) | 26.11 (.381)  | 26.11 (.424) |
| Gender            | Male (%)                    | 36 (55.4)          | 31 (54.4)    | 32 (44.4)     | 20 (36.4)    |
|                   | Female (%)                  | 46 (43.4)          | 26 (45.6)    | 39 (54.2)     | 34 (61.8)    |
|                   | Unknown (%)                 | 1 (1.2)            | -            | 1 (1.4)       | 1 (1.8)      |
| Driving licence   | Full driving licence        | 43 (51.8)          | 31 (54.4)    | 47 (65.3)     | 36 (65.5)    |
|                   | Provisional driving licence | 40 (48.2)          | 26 (45.6)    | 25 (34.7)     | 19 (34.5)    |
| Ethnicity         | White (%)                   | 53 (63.9)          | 37 (64.9)    | 42 (58.3)     | 32 (58.2)    |
|                   | Non-white (%)               | 30 (36.1)          | 20 (35.1)    | 29 (40.3)     | 23 (41.8)    |
|                   | Unknown (%)                 | -                  | -            | 1 (1.4)       | -            |
| Student           | Yes (%)                     | 14 (16.9)          | 9 (15.8)     | 23 (31.9)     | 18 (32.7)    |
|                   | No (%)                      | 57 (68.7)          | 40 (70.2)    | 39 (54.2)     | 30 (54.5)    |
|                   | Unknown (%)                 | 12 (14.5)          | 8 (14.0)     | 10 (13.9)     | 7 (12.7)     |
| Employment status | Full-time (%)               | 35 (42.2)          | 22 (38.6)    | 35 (48.6)     | 27 (49.1)    |
|                   | Part-time (%)               | 11 (13.3)          | 8 (14.0)     | 18 (25.0)     | 15 (27.3)    |
|                   | Not currently in work (%)   | 19 (22.9)          | 15 (26.3)    | 9 (12.5)      | 8 (14.5)     |
|                   | Unknown (%)                 | 18 (21.7)          | 12 (21.1)    | 10 (13.9)     | 5 (9.1)      |
| Scooter ownership | Yes (%)                     | 6 (7.2)            | 3 (5.3)      | 8 (11.1)      | 6 (10.9)     |
|                   | No (%)                      | 77 (92.8)          | 54 (94.7)    | 64 (88.9)     | 49 (89.1)    |
|                   | Don't know (%)              | -                  | -            | -             | -            |

|                  |                | Intervention group |             | Control group |             |
|------------------|----------------|--------------------|-------------|---------------|-------------|
|                  |                | T1&T2              | T1, T2 & T3 | T1&T2         | T1, T2 & T3 |
| Trial use        | Yes (%)        | 20 (24.1)          | 9 (15.8)    | 26 (36.1)     | 18 (32.7)   |
|                  | No (%)         | 60 (72.3)          | 47 (82.5)   | 46 (63.9)     | 37 (67.3)   |
|                  | Don't know (%) | 3 (3.6)            | 1 (1.8)     | -             | -           |
| Planned purchase | Yes (%)        | 4 (4.8)            | 1 (1.8)     | 9 (12.5)      | 6 (10.9)    |
|                  | No (%)         | 59 (71.1)          | 41 (71.9)   | 41 (56.9)     | 32 (58.2)   |
|                  | Maybe (%)      | 20 (24.1)          | 15 (26.3)   | 22 (30.6)     | 17 (30.9)   |

### 3.1.1 Group comparability and response checks

Three sets of analyses were conducted to assess group comparability and to check for any potential response bias.

Within the intervention group, chi-square tests and t-tests were used to examine whether those who completed the follow-up survey (responders) differed from those who did not (non-responders) on age, gender, licence status, ethnicity, student status, employment status, scooter ownership, prior trial use, and planned purchase. Responders and non-responders did not differ significantly on age or most demographic variables (all  $p > .05$ ). However, non-responders were more likely to have tried an e-scooter at baseline ( $\chi^2(2)=9.56$ ,  $p = .008$ ), indicating a small bias towards retaining participants with less prior e-scooter experience.

The same comparisons were carried out within the control group. No significant differences were observed in age or most demographic characteristics. One variable showed a significant difference: gender ( $\chi^2(2)=6.25$ ,  $p = .044$ ). Non-responders in the control group were more likely to be male, whereas responders were more often female.

Finally, among participants who completed the follow-up survey, the intervention and control groups were compared to ensure baseline equivalence. Chi-square tests and an independent-samples t-test found no significant differences between groups for age, gender, licence status, ethnicity, student status, employment status, prior trial use or scooter ownership. Mean age was very similar across groups (25.60 vs. 26.11 years;  $t(110)=-0.81$ ,  $p = .419$ ).

Overall, the intervention and control groups were broadly comparable in their demographic and background characteristics. A minor imbalance was observed in gender distribution within the control group and therefore gender was included as a covariate in subsequent analyses. This adjustment ensured that gender differences did not influence the outcome comparisons.

Statistical results for these checks are presented in Annex D.

## 3.2 ScootSmarter outcome evaluation results

The outcome evaluation examined whether exposure to the ScootSmarter intervention led to measurable improvements in participants' knowledge, attitudes, intentions, and perceptions related to legal e-scooter use, compared with the control film (Highway Code). Analyses focused on both cognitive outcomes, such as understanding of age, licensing, and rule requirements, and behavioural determinants drawn from the Theory of Planned Behaviour, including attitudes, perceived behavioural control, and social norms. By analysing changes across three time points (T1 – pre-intervention, T2 – post-intervention, T3 – follow-up), the evaluation explored both the immediate and sustained effects of the intervention on participants' safety-related knowledge and beliefs.

### 3.2.1 Knowledge

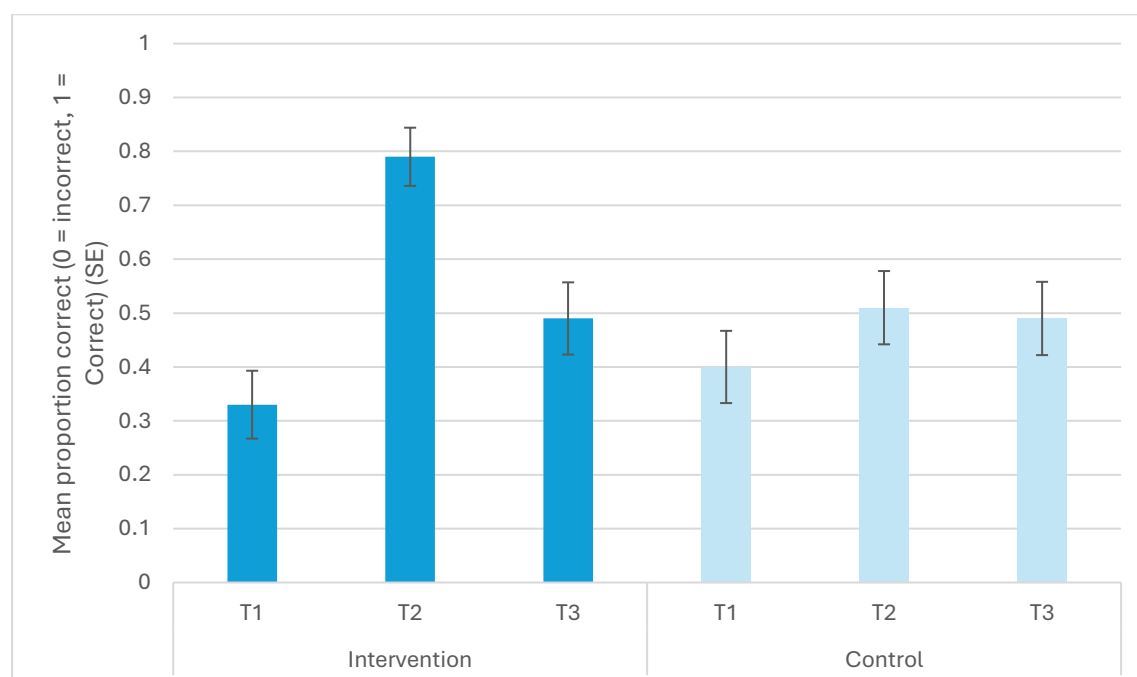
The knowledge component of the evaluation assessed participants' understanding of key legal requirements for e-scooter use in the UK. Specifically, it examined awareness of the minimum legal age, licensing requirements, and rules governing e-scooter use on public roads. These indicators were selected to capture participants' grasp of the most commonly misunderstood aspects of current e-scooter regulations. Analyses explored whether exposure to the ScootSmarter intervention improved factual knowledge immediately after viewing the video and whether any gains were maintained at follow-up.

#### *Minimum age to use an e-scooter*

A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was used to examine changes in correct responses to the minimum age question over time, while controlling for gender. There was a significant effect of Time,  $F(2, 218) = 4.42$ ,  $p = .013$ ,  $\eta^2 = .039$ , showing that knowledge about the minimum age changed across the three testing points. There was a significant interaction between Time and Condition,  $F(2, 218) = 5.94$ ,  $p = .003$ ,  $\eta^2 = .052$ , meaning that the pattern of change over time was different for the intervention and control groups.

Follow-up tests showed that the intervention group's correct responses increased sharply from T1 (.33) to T2 (.79;  $p < .001$ ), but dropped by T3 (.49), returning to the same level as the control group (.49). The control group showed no significant change over time. Whilst the intervention successfully improved knowledge about minimum age requirements immediately after it was delivered (T2), this improvement was not sustained by the later follow-up (T3) (See Figure 3-1).

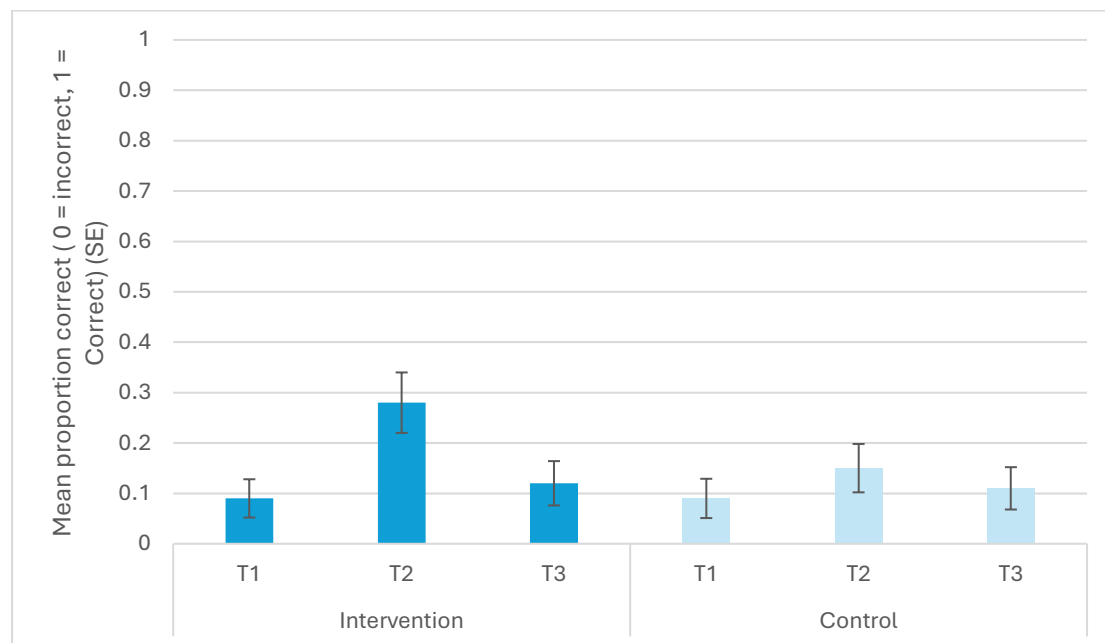
**Figure 3-1: Changes in correct knowledge of the minimum legal age for e-scooter use over time by study group**



### *Licence required for an e-scooter*

Descriptively, the intervention group's correct responses rose from T1 to T2, before falling back to at T3, while the control group remained fairly stable. A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was conducted on correct responses to the licence question, controlling for gender. Although the descriptive pattern suggests a short-term improvement immediately after the intervention, this change was not statistically significant. Notably, the proportion of correct responses in the intervention group remained relatively low even at T2, despite the information having just been presented. This may indicate that the licensing requirement was not sufficiently salient or clearly processed within the short clip, or that there was some disconnect between how the information was presented and how it was assessed in the survey question. The intervention did therefore not produce a reliable change in participants' knowledge of the licence requirement over time (see Figure 3-2).

**Figure 3-2: Correct identification of licensing requirements for e-scooter use over time by study group**



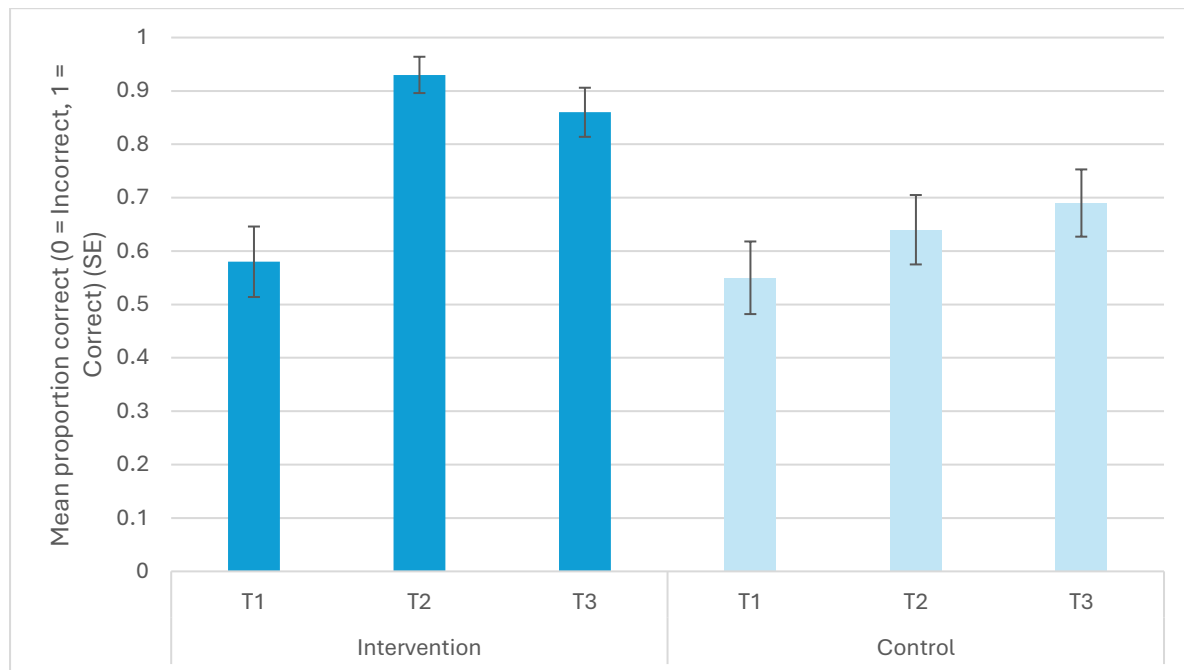
### *Rules associated with e-scooter use*

A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was conducted on correct responses to the rules question, controlling for gender. There was a significant main effect of Time,  $F(1.86, 202.34) = 6.12$ ,  $p = .003$ ,  $\eta^2 = .053$ , indicating that knowledge about e-scooter rules changed across time points. There was also a significant main effect of Condition,  $F(1, 109) = 6.47$ ,  $p = .012$ ,  $\eta^2 = .056$ , with the intervention group showing higher overall accuracy than the control group. There was a significant Time × Condition interaction,  $F(1.86, 202.34) = 4.85$ ,  $p = .010$ ,  $\eta^2 = .043$ , indicating that the pattern of change over time differed between groups.

The intervention group's correct responses increased sharply from .58 at T1 to .93 at T2, before slightly declining to .86 at T3. In contrast, the control group showed more modest improvement (T1: .55, T2: .63, T3: .69), consistent with a potential learner or testing effect arising from repeated exposure to the same question. The significant Time × Condition interaction indicates that the increase observed in the intervention group was greater than would be expected from repeated measurement alone.

Participants who viewed the ScootSmarter clip therefore demonstrated a statistically significant improvement in their understanding of current e-scooter rules immediately after exposure, with much of this gain retained at follow-up (see Figure 3-3).

**Figure 3-3: Correct identification of rules governing e-scooter use over time by study group**



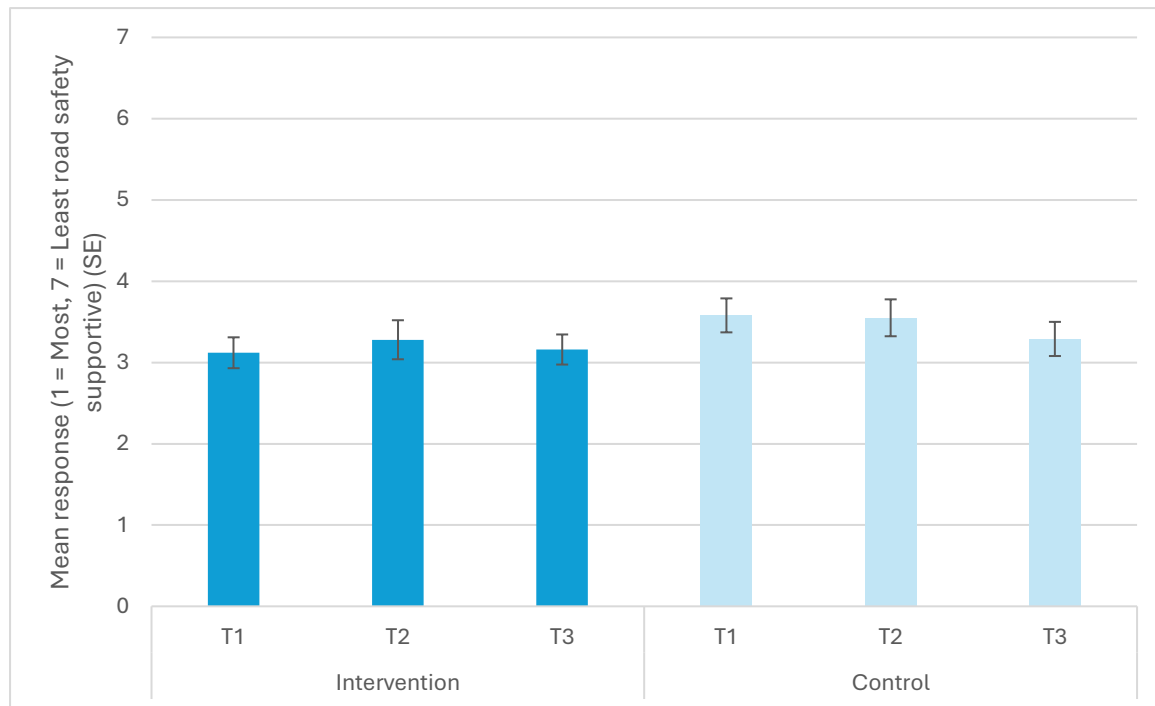
### 3.2.2 Behavioural determinants

This section examines whether the ScootSmarter intervention influenced participants' attitudes, intentions, perceived behavioural control, and social norms related to e-scooter use on public roads. These constructs reflect key determinants of behaviour within the Theory of Planned Behaviour framework and provide insight into the psychological mechanisms through which the intervention may promote safer choices. Mixed ANOVAs were conducted to assess changes across three time points (T1, T2, T3) and between study groups (intervention and control), while controlling for gender. Together, these analyses explore whether exposure to the ScootSmarter video led to measurable shifts in participants' safety-related attitudes, intentions to comply with e-scooter regulations, confidence in following the rules, and perceptions of social approval regarding e-scooter use.

#### *Attitudes to e-scooter use on public roads*

A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was conducted on attitudes toward e-scooter use on roads, controlling for gender. There was no significant main effect of Time,  $F(1.78, 193.80) = 0.53$ ,  $p = .59$ ,  $\eta^2 = .005$ , and no significant Time × Condition interaction,  $F(1.78, 193.80) = 0.57$ ,  $p = .57$ ,  $\eta^2 = .005$ . The main effect of Condition was also non-significant,  $F(1, 109) = 1.77$ ,  $p = .19$ ,  $\eta^2 = .016$ ; both groups showed little change over time. In summary, the intervention did not produce a change in participants' attitudes toward e-scooter use on roads (see Figure 3-4).

**Figure 3-4: Attitudes to e-scooter use on public roads by study group**



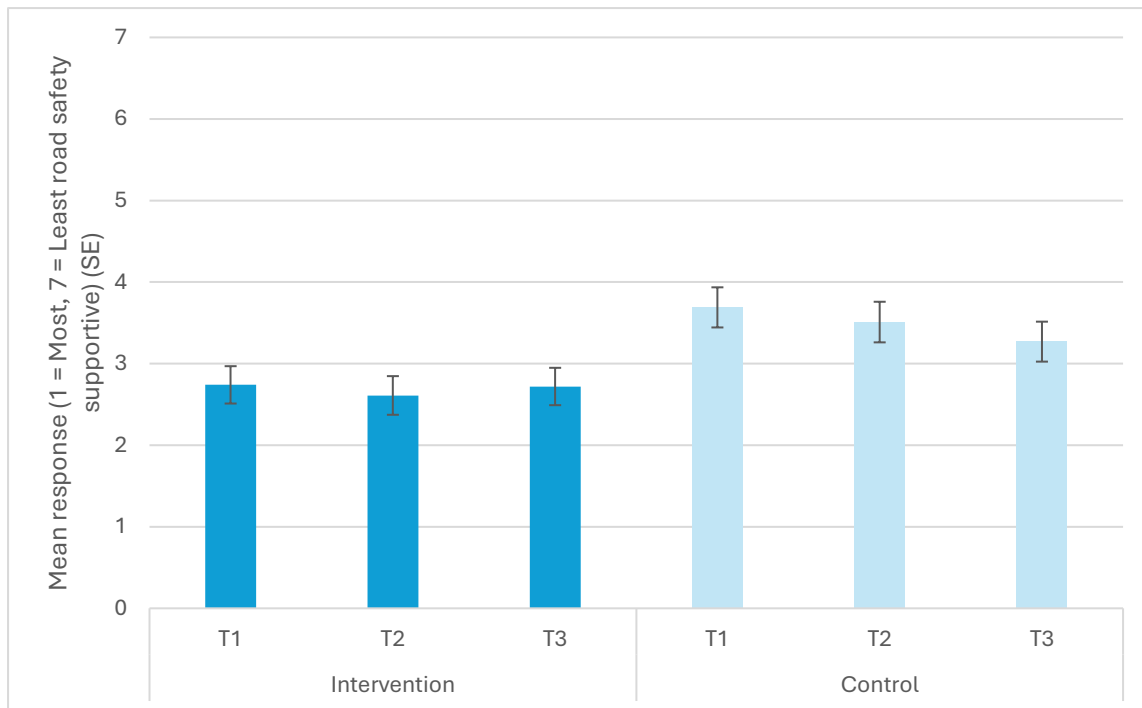
*Intentions towards using private e-scooter illegally on public roads*

A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was conducted on intentions to use a private e-scooter illegally on roads, controlling for gender.

There was no significant main effect of Time,  $F(1.87, 203.70) = 0.07$ ,  $p = .94$ ,  $\eta^2 = .001$ , and no significant Time × Condition interaction,  $F(1.87, 203.70) = 1.17$ ,  $p = .31$ ,  $\eta^2 = .011$ , indicating that intentions did not change over time and that patterns of change did not differ between groups. There was a significant main effect of Condition,  $F(1, 109) = 9.18$ ,  $p = .003$ ,  $\eta^2 = .078$ , with participants in the intervention group reporting lower intentions to use a private e-scooter on the road ( $M = 2.66$ ) than those in the control group ( $M = 3.52$ ). However, this difference was already present at baseline (T1: 2.71 vs. 3.72), and remained relatively stable across time.

As lower scores indicate a more road-safety-supportive position (reflecting lower willingness to ride on roads illegally), the intervention group consistently reported safer behavioural intentions than the control group. However, because there was no significant Time × Condition interaction, this difference reflects a pre-existing group difference rather than an effect of the intervention. Overall, the intervention did not produce a statistically significant change in intentions over time (see Figure 3-5).

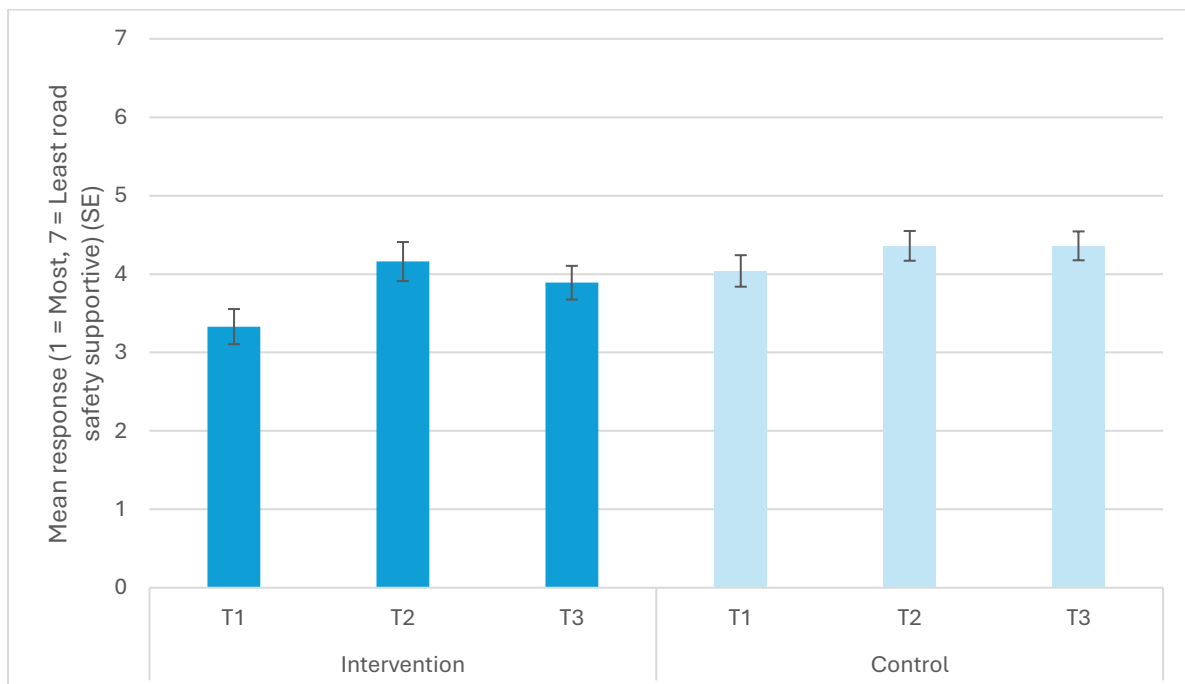
**Figure 3-5: Intentions to use e-scooters on public roads by study group**



*Perceived Behavioural Control for following e-scooter rules*

A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was conducted on perceived behavioural control (PBC) regarding e-scooter use on roads, controlling for gender. There was a significant main effect of Time,  $F(2, 108) = 8.25$ ,  $p = .027$ ,  $\eta^2 = .065$ , and no significant Time × Condition interaction,  $F(1.89, 206.05) = 1.27$ ,  $p = .28$ ,  $\eta^2 = .012$ .

**Figure 3-6: Perceived behavioural control for following e-scooter rules by study group**

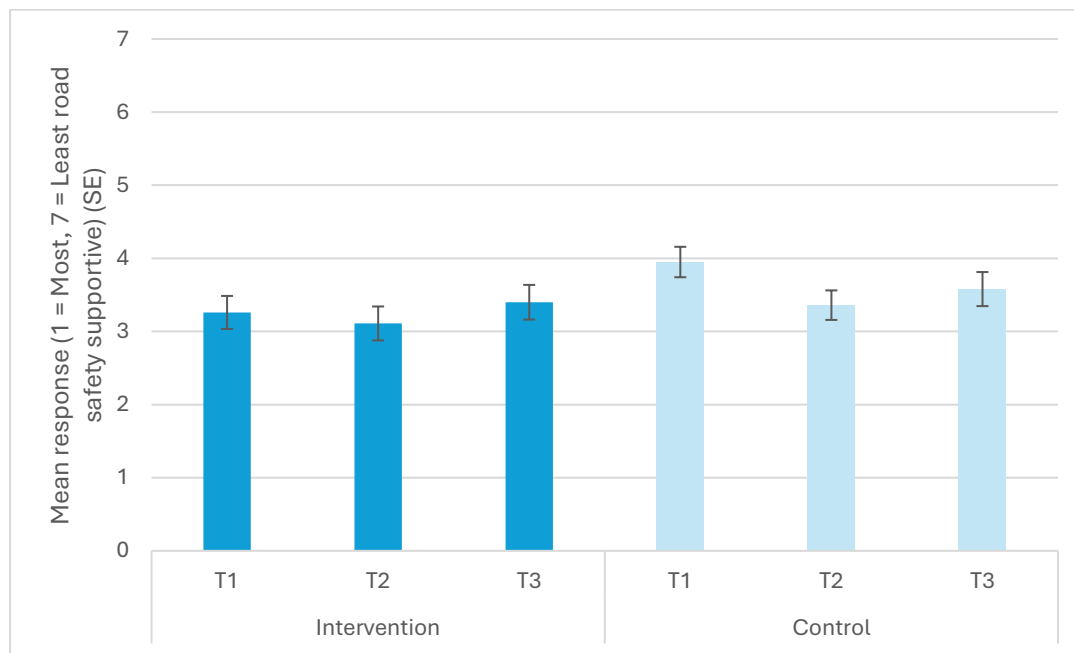


### *Social norms associated with riding e-scooters on public roads*

A 3 (Time: T1, T2, T3) × 2 (Condition: Intervention, Control) mixed ANOVA was conducted on subjective norms regarding e-scooter use on roads, controlling for gender. There was no significant main effect of Time,  $F(1.51, 164.08) = 0.70$ ,  $p = .46$ ,  $\eta^2 = .006$ , and no significant Time × Condition interaction,  $F(1.51, 164.08) = 1.30$ ,  $p = .27$ ,  $\eta^2 = .012$ . The main effect of Condition was also non-significant,  $F(1, 109) = 2.26$ ,  $p = .14$ ,  $\eta^2 = .020$ .

Descriptively, the intervention group's scores and the control group's scores showed a stable pattern across the three time points. In summary, perceptions of social approval for e-scooter use remained largely stable across time and did not differ significantly between groups (see Figure 3-7).

**Figure 3-7: Social norms associated with e-scooter use by study group**



## 3.3 ScootSmarter process evaluation results

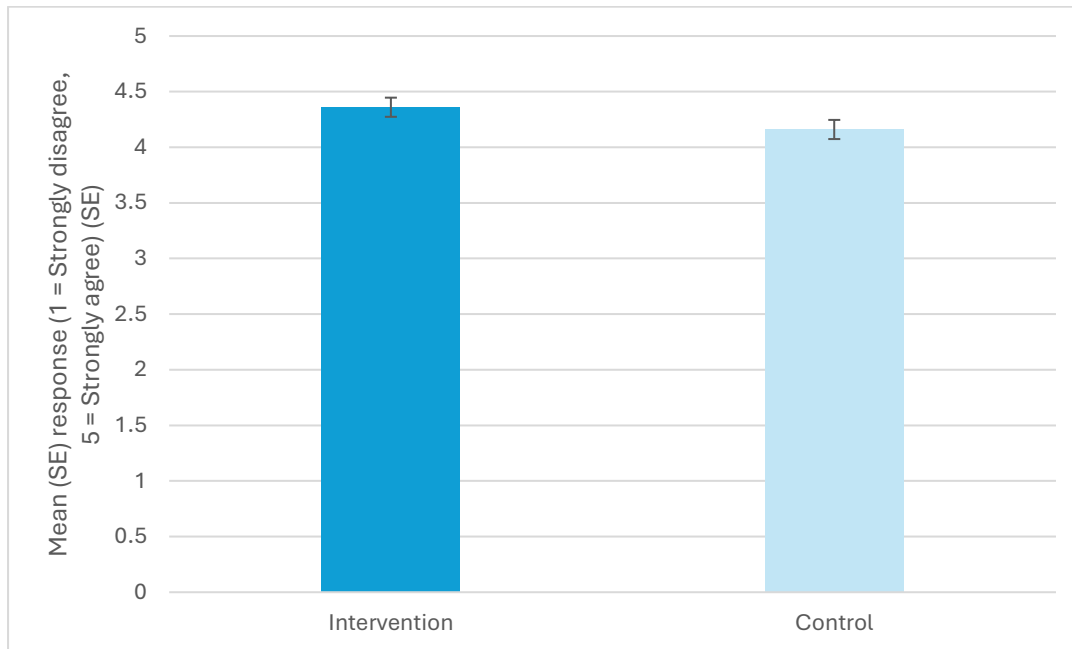
The process evaluation explored participants' perceptions of the ScootSmarter intervention, focusing on how it was received, interpreted, and experienced. In addition to assessing behavioural and knowledge outcomes, this stage of analysis examined three key dimensions of participant response: cognitive impact (the extent to which the material was viewed as credible, useful, important, and informative), emotional engagement (the degree of enjoyment and interest elicited by the video), and face validity (the perceived relevance, personal benefit, and shareability of the content). These measures provide insight into the psychological and experiential factors underpinning the intervention's effectiveness and help identify elements that may strengthen future delivery.

### 3.3.1 Cognitive impact

A reliability analysis was conducted for the four cognitive impact items (credible, useful, important, and informative). The scale demonstrated excellent internal consistency (Cronbach's  $\alpha = .87$ ), indicating that the items reliably measured a single underlying construct.

An independent-samples *t*-test was then performed to compare cognitive impact scores between the intervention and control groups. Results showed that participants in the intervention group rated the materials as somewhat more cognitively impactful than those in the control group (See Figure 3-8), but this difference was not significant,  $t(110) = 1.69$ ,  $p = .09$  (two-tailed).

**Figure 3-8: Composite measure of perceived cognitive impact (credibility, usefulness, importance, informativeness) by study group**

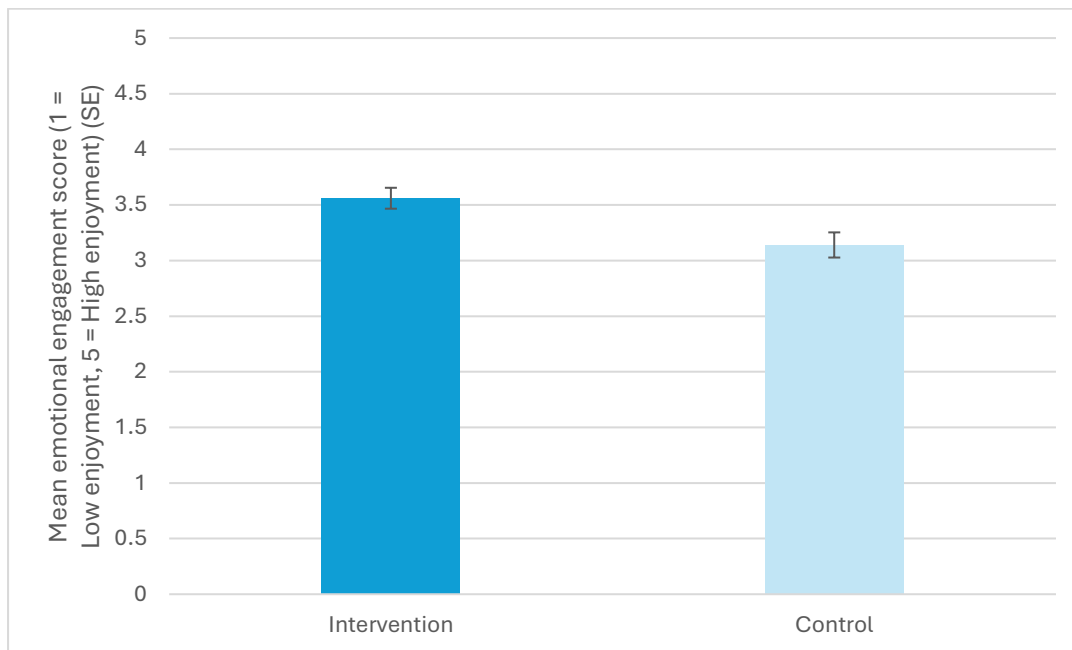


### 3.3.2 Emotional engagement

A reliability analysis was conducted for the two emotional engagement items (*enjoyable* and reverse-coded *boring*). The scale demonstrated acceptable internal consistency (Cronbach's  $\alpha = .70$ ), indicating a satisfactory level of agreement between the two items.

An independent-samples *t*-test was used to compare emotional engagement scores between the intervention and control groups. Results showed that participants in the intervention group reported significantly higher emotional engagement ( $M = 3.56$ ,  $SD = 0.71$ ) than those in the control group ( $M = 3.14$ ,  $SD = 0.84$ ),  $t(110) = 2.91$ ,  $p = .004$  (two-tailed) (See Figure 3-9). The effect size was medium-to-large ( $d = 0.77$ ), indicating that participants exposed to the intervention found the materials notably more engaging and enjoyable than those in the control condition.

**Figure 3-9: Mean emotional engagement ratings (enjoyable/boring composite) by condition. Higher scores reflect greater enjoyment and engagement with the material**

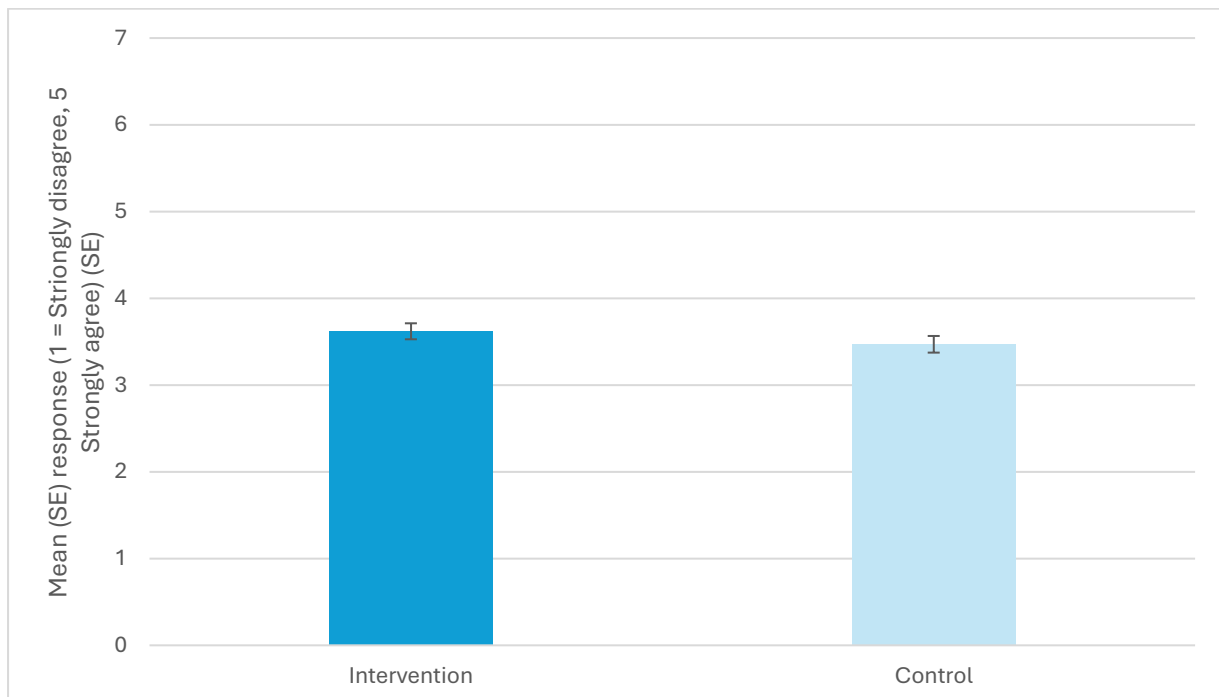


### 3.3.3 Face validity

A reliability analysis was conducted for the three items (i.e. It has benefited me personally, it has provided me with new insights, I would share the video with friends and/or family) assessing the face validity of the intervention content. The scale demonstrated acceptable internal consistency (Cronbach's  $\alpha = .71$ ), indicating that the items measured a reasonably coherent construct.

An independent-samples t-test was conducted to compare mean scores between the intervention and control groups. This difference was not statistically significant,  $t(110) = 1.15$ ,  $p = .25$  (two-tailed), indicating no reliable difference between groups in perceived face validity (See Figure 3-10).

**Figure 3-10: Composite measure of perceived face validity (benefit, insight, and willingness to share) by study group**



The following open text responses were provided about the ScootSmarter intervention:

- *“I thought it was nice and concise”*
- *“It was very professional”*
- *“It was simply communicated, easy to understand and the lady presenting made the information come across well”*
- *“It was engaging and edited really well. I would only have preferred facts sooner in the video as they were interesting to hear”*
- *“I believe the video would have been more beneficial if I was interested in using an e-scooter”*

Overall, responses suggest a positive reception of the ScootSmarter intervention, with participants valuing its clarity, professionalism, and engaging presentation. Some feedback indicated that introducing key facts earlier could improve interest, especially for those less inclined toward e-scooter use. This feedback highlights both strengths and minor areas for refinement.

## 4.0 Discussion

The evaluation of the ScootSmarter intervention provides a clear and realistic picture of its effectiveness in strengthening understanding of e-scooter regulations and shaping safety-supportive thinking. Statistically significant effects were observed for knowledge of key rules. The findings suggest that ScootSmarter's primary strength lies in enhancing factual understanding and engagement, laying a foundation for longer-term behavioural influence.

### 4.1 Knowledge gains

ScootSmarter demonstrated evidence of effectiveness in improving participants' knowledge of e-scooter regulations, though these effects varied by topic and time point. The intervention significantly increased correct responses on the minimum legal age and rules for e-scooter use immediately after exposure, with the latter improvement largely maintained at follow-up. This indicates that the video successfully communicated key aspects of safe and legal e-scooter use, particularly those related to riding rules and restrictions.

However, knowledge about licensing requirements showed no statistically significant change over time, suggesting that this element of the message may not have been as salient or easily retained. Moreover, while knowledge of the minimum age improved sharply post-intervention, it declined by the follow-up point, indicating that some information was not fully consolidated. Together, these results suggest that ScootSmarter is effective at producing immediate learning gains, but reinforcement or repeated exposure may be needed to sustain knowledge over time.

### 4.2 Behavioural determinants

The intervention's impact on behavioural determinants was more modest. There were no significant effects of time or time  $\times$  condition interactions for attitudes, intentions, or social norms toward e-scooter use on public roads. This indicates that, although the intervention improved knowledge, it did not lead to measurable changes in participants' broader perceptions or intentions regarding e-scooter use.

The one exception was a significant main effect of condition for behavioural intentions, with the intervention group reporting consistently lower intentions to use e-scooters on public roads than the control group. This pattern suggests that participants who viewed ScootSmarter held more safety-supportive intentions from the beginning, and was a difference between the groups rather than affected by the intervention.

Results for perceived behavioural control (PBC) showed a significant main effect of time but no interaction with condition. This indicates that participants' perceived ability to use e-scooters legally changed across time, but not differentially between groups. The intervention group's temporary increase in PBC scores immediately after viewing the video, followed by a decline, may reflect greater awareness of the challenges associated with following e-scooter regulations. This short-term rise in perceived difficulty could also represent an initial cognitive adjustment to new information rather than a loss of confidence, consistent with early stages of attitude integration.

### 4.3 Perceived impact and engagement

Participants' perceptions of the intervention itself were generally positive. The cognitive impact scale showed good internal consistency, with intervention participants rating the film as credible, useful, important, and informative, although it did not score significantly higher than the control video.

The emotional engagement results were stronger: participants in the intervention group reported significantly higher enjoyment and lower boredom than those in the control group, indicating that ScootSmarter was more engaging and effectively held viewers' attention. In contrast, perceptions of face validity, the extent to which participants felt the video was beneficial, provided new insights, or worth sharing, did not differ significantly between groups.

Qualitative feedback reinforced these findings. Participants described the ScootSmarter video as clear, concise, professional, and easy to understand, while suggesting that presenting key facts earlier might further enhance engagement. Overall, these perceptions indicate that ScootSmarter achieved credibility and engagement, both essential precursors for effective learning and behavioural influence.

### 4.4 Limitations and implications

Several limitations should be noted. First, although the inclusion of a follow-up survey strengthens the design, the 8–10 week interval may not fully capture long-term retention or change in measured behavioural determinants. Second, both the intervention and control groups viewed short 2-minute clips rather than the full-length 10-minute video (in the case of ScootSmarter), potentially reducing the overall impact on behavioural determinants. Third, while the study controlled for key demographic variables, small differences in prior e-scooter experience could have influenced results. Fourth, a substantial proportion of participants reported no prior experience of e-scooter use and were therefore unlikely to have had opportunities to apply or reinforce newly acquired knowledge during the 8–10 week follow-up period, which may have limited the extent of observable sustained effects.

The absence of significant effects for attitudes, social norms, and most behavioural measures is consistent with wider findings in road safety and behaviour change research, where information provision alone rarely produces measurable shifts in motivation or behaviour. However, information remains a vital precursor to change, especially in contexts where baseline knowledge is low. The results of this study highlight that many participants lacked a clear understanding of e-scooter rules prior to the intervention, underlining the importance of addressing these knowledge gaps as a foundation for future progress. To achieve sustained behavioural impact, ScootSmarter could be most effective when positioned within a broader educational framework that combines reinforcement, discussion-based reflection, and social influence components to support the translation of knowledge into practice.

## 5.0 Conclusions

The evaluation of the ScootSmarter intervention provides evidence that short, targeted educational films can enhance understanding of e-scooter regulations and support the development of more safety-conscious perspectives. The intervention produced statistically significant improvements in knowledge of e-scooter rules and immediate post-intervention gains in awareness of the minimum age requirement for legal use, though the latter effect was not

sustained at follow-up. These findings highlight the capacity of ScootSmarter to address key knowledge gaps in a population where understanding of legal e-scooter use remains limited.

Although no significant changes were found for attitudes, intentions, or social norms, the overall direction of results was safety-supportive, suggesting that participants exposed to the intervention in combination with other measures that reinforce the messaging could develop greater awareness of, and sensitivity to, legal constraints on e-scooter use.

Participants also rated ScootSmarter as engaging, informative, and credible, with significantly higher emotional engagement than the control film. This combination of clarity, professionalism, and engagement suggests that ScootSmarter successfully captures attention and delivers messages in a format likely to support learning and recall.

As is often observed in road safety and behavioural science research, low dose (e.g., 2-min videos) information provision alone is unlikely to produce deep or sustained behavioural change. However, it remains a critical precursor to action, particularly in domains characterised by low baseline knowledge. The results of this evaluation reinforce the importance of delivering accurate, accessible information as a foundation for safer e-scooter use. To strengthen and sustain its impact, future iterations of ScootSmarter could integrate reinforcement strategies, such as interactive follow-ups, discussion prompts, or social influence components, to encourage reflection and translate knowledge into practice.

In summary, ScootSmarter has demonstrated value as a credible and engaging educational resource capable of improving understanding of e-scooter rules and raising awareness of legal compliance. While its effects on behavioural determinants were limited, it has a role in establishing the informational groundwork for safer riding behaviours. With targeted refinement and integration into broader educational or enforcement initiatives, ScootSmarter could make a meaningful contribution to promoting legal and responsible e-scooter use in the UK.

## 6.0 References

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## Annex A: ScootSmarter Intervention Plan

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Q1. What is the aim of the intervention</b></p> <p>To provide e-scooter purchasers with information about rules for e-scooter usage (private and public trials) and encourage them to commit to using e-scooters in legal situations only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b>Q2. Who is the target audience</b></p> <p>Purchasers of e-scooters.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>Q3. What do they need to do differently to achieve the desired change?</b></p> <p>Increased knowledge of e-scooter rules and regulations, a commitment to only use e-scooters legally, the development of personally relevant plans for using other modes of transport as a replacement for the e-scooter when wanting to travel on public roads.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>Q4. When do they need to do this behaviour?</b></p> <p>At all times when using an e-scooter.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p><b>Q5. Where do they need to be to do it?</b></p> <p>At home or on private land (where there is not public access).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Q6. How often do they need to perform the behaviour?</b></p> <p>Every time they use an e-scooter.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>Q7. With whom do they need to perform the behaviour with?</b></p> <p>On own or with other family members/those that users share the e-scooter with.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>Q8. What needs to change (applying COM-B)?</b></p> <p>There is a need to influence behaviour across all COM-B (i.e., Capability, Opportunity and Motivation) components:</p> <p><i>Physical capability</i> – N/A;</p> <p><i>Psychological capability</i> – Having knowledge about rules around e-scooter use in the UK;</p> <p><i>Physical opportunity</i> – Perceptions of e-scooter use in the UK, which is influenced by the fact that they are legal to sell and to use on the public roads within UK trials;</p> <p><i>Social opportunity</i> – To have a cultural norm/social expectation that private e-scooters should not be used on the public roads;</p> <p><i>Reflective motivation</i> – Plan to use e-scooters in a legal way, or to use another method of transport; and</p> <p><i>Automatic motivation</i> – Not acting on inclination to use e-scooters on public roads and footpaths, just because other people are using them there.</p> |

**Q9. What intervention functions should be employed?**

*Education* – Increase knowledge and understanding of how private and public trial e-scooters can be used legally.

*Persuasion* – Using communication to induce positive feelings about using e-scooters legally and increase negative feelings around not doing so.

*Training* – Imparting skills about how to ride safely (separate approach for private and public trial e-scooters).

*Modelling* – Providing an example of people to aspire to or imitate those who are already enacting and benefiting from using e-scooters legally.

*Enablement* – Develop plans to use e-scooters in a legal way, or use another method of transport.

**Q10. What BCTs should be employed**

*Education* – Information about health, social and environmental consequences of not using private e-scooters legally (BCT 5.1 & 5.3).

*Persuasion* – Information provided by a credible source (BCT 9.1) (i.e., target audience peers, respected person – manufacturer, police or retailer). Verbally persuade audience that they can successfully adopt a mindset to plan to only use private e-scooters in legal circumstances (BCT 15.1). Identification of self as a role model (BCT 13.1) (i.e., in not using the e-scooter in illegal conditions, you are not promoting it to others who might see you doing it).

*Training* – Demonstrate how people should ride e-scooters legally (BCT 6.1), provide instruction about how and when e-scooters can be ridden legally (BCT 4.1), advise audience to imagine successfully using their private e-scooter in legal circumstances – asking them to look at what it looks and feels like (BCT 15.2).

*Modelling* – Demonstrate how people should use private e-scooters (BCT6.1).

*Enablement* – Prompt target audience to identify what the barriers are to them using their e-scooter legally (e.g., not a priority, everyone else does it, I've brought it so I want to use it) and come up with ways to overcome them (BCT 1.2). Ask target audience to affirm a strong commitment to only using their private e-scooters legally, and to access a public trial scooter should they want to use a scooter on the public roads (BCT 1.9). Draw attention to target audience of their use of (or enabling someone else) to use a scooter illegally, and their self-identification as a responsible, safe person (BCT 13.3).

**Q11. What is the logic model for this intervention**

*Inputs* – Delivering the e-scooter intervention will...

*Immediate impacts* – result in the dissemination of information about rules for e-scooter usage (private and public trials) which will...

*Short term impacts* – result in changes to the number of recipients being aware of private and public e-scooter rules, committing to only using e-scooters in legal situations and the development of personally relevant plans for using their e-scooter or public e-scooters within trials which will ...

*Behavioural impacts* – lead to e-scooters being used in a safe and legal manner which will...

*Health Outcomes* – make the roads safer for e-scooter users and all road users who interact with them

**Q12. What would need to be measured, before and after the intervention was delivered, to establish whether it is successful?**

Recipients knowledge of e-scooter rules (private and trial e-scooters)

Attitudes toward using private e-scooters on public roads

Intentions towards using private e-scooters on public roads

Commitment to using privately owned e-scooters on private land only

Plans for when and where private e-scooters will be used

Perceived behavioural control in being able to use private e-scooters in the legal circumstances

Social norm (others' views) on private e-scooter usage on public roads

## Annex B: Consent Form

In this study, we are seeking to understand people's knowledge, attitudes, and intentions regarding e-scooter usage in the UK. The study consists of two surveys, and watching a short video, taking about 15 minutes in total. There are no specific requirements to participate, just answer the questions honestly and complete all parts. Thank you for your interest in this research.

**Survey Aim:** To understand knowledge and attitudes toward e-scooter usage

This research aims to explore current beliefs, knowledge, and attitudes about e-scooter usage and the related rules in the UK. The results will help improve road safety for e-scooter and other road users.

Any information you provide is confidential and no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published.

Your participation is voluntary and you can choose not to participate in the survey now that you have more information. Co-Pilot is the organisation responsible for processing the information in this survey and complying with its duties and obligations under GDPR.

If you give your consent to take part please click 'I agree' below

- ☐ I agree
- ☐ I do not agree

## Annex C: Survey Questions

Nb. Those that are marked with two asterisks (\*\*) were asked at T2 only. Lower scores indicate safer behaviours. Reverse coded survey items are marked with a +. Survey item references are provided at the end of the table.

| Item      | Question                                                                                                        | Measure                                                                                                                                                                                                                                        |
|-----------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OWNSHP    | Do you currently own an e-scooter?                                                                              | Yes, No                                                                                                                                                                                                                                        |
| TRIAL_USE | Have you ever used an e-scooter from an official trial?                                                         | Yes, No, Don't know                                                                                                                                                                                                                            |
| PURCHASE  | Do you plan to buy a private e-scooter in the next six months?                                                  | Yes, No, Maybe                                                                                                                                                                                                                                 |
| RULES     | What are the current rules regarding e-scooter usage in public spaces in the UK? (Please select all that apply) | E-Scooters can be used on any public road, E-Scooters can only be used on private property/land (Correct), E-Scooters can be used on pavements, E-Scooters can be used in official trial areas with certain rules (Correct), None of the above |
| LICENCE   | Do you need a driving licence (full or provisional) to use an e-scooter in the UK?                              | Yes, for both private and trial e-scooters; Yes, but for trial e-scooters (Correct); No, a driving licence is not required; I don't know                                                                                                       |
| MIN_AGE   | What is the minimum age required to legally use an e-scooter in the UK?                                         | 14 years, 16 years (Correct), 18 years, There is no minimum age, I don't know                                                                                                                                                                  |
| ATT       | Riding e-scooters on the public road is... <sup>1</sup>                                                         | Very beneficial (1) - Very harmful (7) +                                                                                                                                                                                                       |
| INT       | How willing would you be to ride a private e-scooter on public roads? <sup>1</sup>                              | Very willing (1) – Very unwilling (7) +                                                                                                                                                                                                        |
| PBC       | How easy or difficult do you think it is to use a private e-scooter legally in the UK? <sup>1</sup>             | Very easy (1) – Very difficult (7) +                                                                                                                                                                                                           |
| SNORM     | People who are important to me would approve/disapprove of me riding a private e-scooter on the public roads    | Strongly approve (1) – Strongly disapprove (7)+                                                                                                                                                                                                |
| COG_1**   | To what extent do you agree or disagree that the ScootSmarter/Highway Code video was...Credible <sup>2</sup>    | Strongly agree (1) – Strongly disagree (5) +                                                                                                                                                                                                   |
| COG_2**   | To what extent do you agree or disagree that the ScootSmarter/Highway Code video was...Useful <sup>2</sup>      | Strongly agree (1) – Strongly disagree (5) +                                                                                                                                                                                                   |
| COG_3**   | To what extent do you agree or disagree that the ScootSmarter/Highway Code video was...Important <sup>2</sup>   | Strongly agree (1) – Strongly disagree (5) +                                                                                                                                                                                                   |
| COG_4**   | To what extent do you agree or disagree that the ScootSmarter/Highway Code video was...Informative <sup>2</sup> | Strongly agree (1) – Strongly disagree (5) +                                                                                                                                                                                                   |

| Item       | Question                                                                                                                                                                                            | Measure                                      |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| COG_5**    | To what extent do you agree or disagree that the ScootSmarter/Highway Code video was...Enjoyable <sup>2</sup>                                                                                       | Strongly agree (1) – Strongly disagree (5) + |
| COG_6**    | To what extent do you agree or disagree that the ScootSmarter/Highway Code video was...Boring <sup>2</sup>                                                                                          | Strongly agree (1) – Strongly disagree (5) + |
| FC_VALD1** | Please indicate the extent to which you agree or disagree with the following statements about the ScootSmarter/Highway Code video: It has benefited me personally <sup>3</sup>                      | Strongly agree (1) – Strongly disagree (5) + |
| FC_VALD2** | Please indicate the extent to which you agree or disagree with the following statements about the ScootSmarter/ Highway Code video: It has provided me with new insights <sup>3</sup>               | Strongly agree (1) – Strongly disagree (5) + |
| FC_VALD3** | Please indicate the extent to which you agree or disagree with the following statements about the ScootSmarter/ Highway Code video: I would share the video with friends and/or family <sup>3</sup> | Strongly agree (1) – Strongly disagree (5) + |
| COMMENT    | If you have any comments or suggestions about the ScootSmarter/ Highway Code video please make them here                                                                                            | Free text response                           |

<sup>1</sup> Measured using adapted standard measures for Theory of Planned Behaviour components (Conner & Sparks, 2005; Rowe et al., 2016) <sup>2</sup> Cognitive response measured by measures from Cuenen et al. (2016) <sup>3</sup> Face validity measured by adapting measures from Road Safety Analysis (2015)

## Annex D: Baseline and response comparisons

This annex presents the chi-square and t-test results used to assess group comparability and potential response bias.

### D1. Intervention group: Responders vs. Non-responders (n = 83)

| Variable               | Test                               | df          | p-value            | Interpretation                                                            |
|------------------------|------------------------------------|-------------|--------------------|---------------------------------------------------------------------------|
| Age                    | $t(81)=-1.04$                      | .300        | ns                 | No significant age difference between responders and non-responders.      |
| Gender                 | $\chi^2(2)=2.44$                   | .296        | ns                 | Similar gender distribution across groups.                                |
| Driving licence        | $\chi^2(1)=.49$                    | .486        | ns                 | No difference in licence status.                                          |
| Ethnicity              | $\chi^2(1)=.09$                    | .767        | ns                 | No difference in ethnicity.                                               |
| Student status         | $\chi^2(2)=.21$                    | .901        | ns                 | No difference in student status.                                          |
| Employment status      | $\chi^2(3)=1.60$                   | .659        | ns                 | No difference in employment status.                                       |
| Scooter ownership (T1) | $\chi^2(1)=1.05$                   | .306        | ns                 | No difference in ownership at baseline.                                   |
| <b>Trial use (T1)</b>  | <b><math>\chi^2(2)=9.56</math></b> | <b>.008</b> | <b>Significant</b> | <b>Non-responders more likely to have tried an e-scooter at baseline.</b> |
| Planned purchase (T1)  | $\chi^2(2)=3.94$                   | .140        | ns                 | No significant difference in planned purchase.                            |

### D2. Control group: Responders vs. non-responders (n = 72)

| Variable               | Test                               | df          | p-value            | Interpretation                                                                   |
|------------------------|------------------------------------|-------------|--------------------|----------------------------------------------------------------------------------|
| Age                    | $t(70)=.01$                        | .992        | ns                 | No age difference between responders and non-responders.                         |
| <b>Gender</b>          | <b><math>\chi^2(2)=6.25</math></b> | <b>.044</b> | <b>Significant</b> | <b>Non-responders were more likely to be male; responders more often female.</b> |
| Driving licence        | $\chi^2(1)=.00$                    | .955        | ns                 | No difference in licence status.                                                 |
| Ethnicity              | $\chi^2(1)=.23$                    | .632        | ns                 | No difference in ethnic composition.                                             |
| Student status         | $\chi^2(2)=.28$                    | .871        | ns                 | No difference in student status.                                                 |
| Employment status      | $\chi^2(3)=2.73$                   | .435        | ns                 | No difference in employment type.                                                |
| Scooter ownership (T1) | $\chi^2(1)=.01$                    | .922        | ns                 | No difference in e-scooter ownership at baseline.                                |
| Trial use (T1)         | $\chi^2(1)=1.16$                   | .282        | ns                 | No difference in prior trial use of e-scooters.                                  |
| Planned purchase (T1)  | $\chi^2(2)=.54$                    | .762        | ns                 | No difference in intention to purchase an e-scooter.                             |

**D3. Responders only: Intervention vs control (n = 112)**

| Variable               | Test             | df   | p-value    | Interpretation                                                                                  |
|------------------------|------------------|------|------------|-------------------------------------------------------------------------------------------------|
| Age                    | $t(110)=-0.81$   | .419 | ns         | Groups were similar in age (M=25.6 vs 26.1 years).                                              |
| Gender                 | $\chi^2(2)=1.89$ | .389 | ns         | Similar gender distribution.                                                                    |
| Driving licence        | $\chi^2(1)=1.43$ | .232 | ns         | Comparable licence status.                                                                      |
| Ethnicity              | $\chi^2(1)=.54$  | .464 | ns         | Comparable ethnic composition.                                                                  |
| Student status         | $\chi^2(2)=4.46$ | .107 | ns         | No significant difference (slightly more students in Control).                                  |
| Employment status      | $\chi^2(3)=7.62$ | .055 | Borderline | Borderline difference – Control participants more often in work.                                |
| Trial use (T1)         | $\chi^2(2)=5.16$ | .076 | Borderline | Borderline difference – Control participants more likely to have tried an e-scooter previously. |
| Planned purchase (T1)  | $\chi^2(2)=4.77$ | .092 | Borderline | Borderline difference – Control participants slightly more likely to plan a purchase.           |
| Scooter ownership (T1) | $\chi^2(1)=1.21$ | .272 | ns         | No significant difference in ownership.                                                         |

**Notes**

ns = not significant ( $p > .05$ ).

Borderline =  $.050 \leq p < .100$ ; interpret cautiously.

All p values two-sided unless otherwise stated.