

Revisiting attitude change sixteen months down the road

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Executive Summary

1. The British Horse Society and Cycling UK created two videos of horse riders and two videos of cyclists that aimed to improve car drivers' attitudes and intended future passing behaviours through the evocation of empathy.
2. A previous evaluation of the videos found that viewing the videos significantly improved car drivers' explicit attitudes towards horse riders and cyclists. The drivers also reported greater passing distances and lower passing speeds in their intentions to overtake these vulnerable road users. Arguments were made to mitigate the impact of social desirability on these data, and the intervention videos were found to be effective in changing immediate attitudes and intended future behaviours of car drivers.
3. It was unclear from the previous research, however, whether these benefits would persist over time. Many other interventions that have shown initial promise, have been found to have greatly diminished effects, no effects whatsoever, or even negative 'rebound' effects when measures are taken months later in a follow-up study.
4. The current research was undertaken to follow-up participants who had taken part in the initial study.
5. Participants were given the same explicit attitude questions (towards both horse riders and cyclists) as in the initial study and two passing behaviour questions (what they thought the minimum distance should be when overtaking the vulnerable road user, and what speed they would use to pass). Implicit attitude was not measured in the current study as it had not shown any significant differences in the initial study.
6. Out of the 344 original participants, 224 completed the follow-up study giving a respectable response rate of 65%.
7. To confirm that the original findings were still present within the smaller sample size we repeated the original analyses between Time 1 (T1, pre-intervention) and Time 2 (T2, post-intervention) and almost all beneficial effects were still observed (only the speed choice for cyclists did not show the original effect).
8. When comparing T1 and Time 3 (T3, follow-up), however, no significant differences were found in the explicit attitudes towards horse riders and cyclists or the intended passing behaviours (speed and distance) when facing these vulnerable road users.
9. In conclusion, the immediate effectiveness of the road safety videos in the original study was no longer present sixteen months later. This suggests that repeated messaging is required to achieve persistent changes in attitude and intended behaviour, which could potentially be achieved using cheaper alternatives like radio messaging.

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1. Introduction

In 2021, the British Horse Society and Cycling UK created 4 videos that aimed to improve the empathy of car drivers towards two specific classes of vulnerable road users (VRUs): horse riders and cyclists. The videos featured emotive interviews with two horse riders (Julie, who works in the fire service, and Laura, a paediatric nurse), and two cyclists (Priya, a geriatric nurse, and Duncan, a concerned father). The focus on worthwhile jobs or family concerns was designed to breakdown the stereotypical labels that some drivers might apply to these categories of road users.

The current authors subsequently evaluated the impact of these videos on car drivers' attitudes and future intended passing behaviours (Crundall and van Loon, 2023). We split 344 participants across two studies, one focusing on the horse rider videos and the other on the cyclists. Within these groups, participants were yet again divided into a control group and an intervention group. Only the two intervention groups saw the horse rider or cyclist videos, while the control group were shown a hazard perception training video that had nothing to do with vulnerable road users.

We found that drivers' attitudes towards horse riders and cyclists improved after viewing the intervention videos compared to the control group, though the effect was specific to the vulnerable road users who were depicted (i.e., participants who saw the horse videos reported more positive attitudes towards horse riders though their attitudes to cyclists did not change, and vice versa).

To gauge drivers' intended passing behaviours, participants were asked to move an image of a car nearer or further away from a horse and rider or a cyclist in a static image, and then to select the speed they thought appropriate for that overtake. Participants in the intervention group recorded wider and slower passing behaviours after watching the intervention videos, whereas control participants' passing choices did not change across the duration of the study.

The results were interpreted as a success: the videos had influenced explicit attitudes and intended passing behaviours towards specific VRUs. Arguments were also made that diminished the possibility that social desirability was responsible for the effects, including the fact that the videos only impacted on attitudes for the targeted VRU rather than cyclists and horse riders alike. We did however note that post-intervention attitudes and intended future behaviours were only collected immediately after the intervention. While the pilot was considered effective, it remained a possibility that the benefits are short-lived, and we recommended that a follow-up study be conducted. Previous research on initially promising safety interventions have tended to show diminished benefits at follow-up (Poulter and McKenna, 2010, Box and Dorn, 2023), and this study aimed to determine whether the Look Out For Laura campaign concurred with existing evidence of this trend.

The current study is a replication of the post-intervention surveys from Crundall and van Loon (2023) using as much of the same original sample as was possible to recruit. It was undertaken approximately 16 months following the first study. The follow-up study employed identical explicit attitude questions, and the same questions that probed passing distance and speed intentions. The original study also included an implicit attitude test, though as Crundall and Van Loon (2023) found no effect of the intervention on implicit attitudes (or even any significant implicit attitudes prior to the intervention), this element of the test battery was excluded for the follow-up.

Regarding predictions, we anticipated that any beneficial effect noticed between time 1 (T1, pre-intervention) and time two (T2, immediately following the intervention) would be preserved in the

slightly reduced sample of the follow-up study. Even if there is deterioration of the beneficial effect, we hoped that T3 scores would still show improvement over T1.

2. Method

2.1 Participants

For the current study, only the participants that had taken part in the original study through the paid participant platform Prolific (290 out of a total of 344 participants) were invited to participate. These participants could be recontacted via an anonymous link, which was not available for participants who undertook the original survey via different routes. As the follow-up study was carried out nearly 16-months after the original study, not all the 290 participants were still active on the Prolific platform. Only 233 out of the 290 original participants had been active on Prolific in the three months before the start of the study. Of those, 224 participants (96%) completed the follow-up study, which reflects a very high response rate of the available participants. The overall response rate of the follow-up study, compared back to the original sample size, was 65%. Table 1 shows a breakdown of the number of participants in the respective conditions for the original study (Study 1) and the follow-up study (Study 2).

Table 1. Number of participants in each condition for the first and second study.

	Horse & Rider Intervention Group	Horse & Rider Control Group	Cyclist Intervention Group	Cyclist Control Group	Total
Study 1 ¹ total	82	80	92	90	344
Study 1 Prolific	67	65	74	84	290
Study 2 Prolific ²	50	48	64	62	223
% Total	61%	60%	69%	69%	65%
% Prolific	75%	74%	86%	74%	77%

¹Data for Study 1 were collected between 26-1-2022 and 14-3-2022.

²101 out of 132 participants from the horse study and 132 out of 158 participants from the cycling study had been active on Prolific in the three months before the start of Study 2 (data collected between 31-5-2023 and 4-7-2023).

2.2 Design, Materials and Procedure

Evaluation of the horse and rider videos and the cyclist videos were essentially treated as two separate designs which were delivered online via Qualtrics. Each study adopted a 2 x 3 mixed design, with independent variables of *Time* and *Group*. *Time* refers to the point at which attitudinal data and intended future behaviour data were recorded relative to the intervention. *Time* has 3 levels: immediately before the intervention (T1), immediately following the intervention (T2), and an average of 16 months following the intervention (T3). The second independent variable of *Group* reflects that participants were split into an intervention group and a control group.

The dependent variables included 10 explicit attitude statements that required a response to indicate participants' level of agreement on a 1-5 scale ('Strongly disagree' to 'Strongly agree'; see

Table 2). The original attitude questions of Crundall and van Loon (2023) included 2 additional questions which we subsequently dropped. These were omitted from the current survey. In addition, we probed drivers' intentions to pass a cyclist or horse using a novel test that presented participants with a static image of a cyclist or horse and rider being overtaken by a car. Participants could move the car nearer to the vulnerable road user, or further away, to reflect their belief in a safe passing distance. Movements of the car were constrained to 7 points on a sliding scale.

A second passing question asked participants to report the speed they would overtake the horse or cyclist. A sliding scale allowed any response between 1 and 50 mph (though a 40-mph limit was visible painted on the road in the image; see Figure 1).

The original study used an implicit attitude test, though as no negative implicit attitudes were detected in the groups, this test was not considered relevant for this follow-up study. For further details of the study design please refer to Crundall and van Loon (2023).

Table 2. Statements given to respondents to gauge explicit attitudes to horse riders and cyclists.

Statements	Scoring (1-5)
Most horse riders behave responsibly when on the road	Positively scored
Horse riders should not be on the roads	Reverse scored
Car drivers should take extra care when passing cyclists	Positively scored
Most cyclists behave responsibly when on the road	Positively scored
Horse riders should move out of the way when I need to overtake	Reverse scored
Cyclists should not be on the roads	Reverse scored
Cyclists are similar people to me	Positively scored
Horse riders are similar people to me	Positively scored
Cyclists should move out of the way when I need to overtake	Reverse scored
Car drivers should take extra care when passing horses	Positively scored

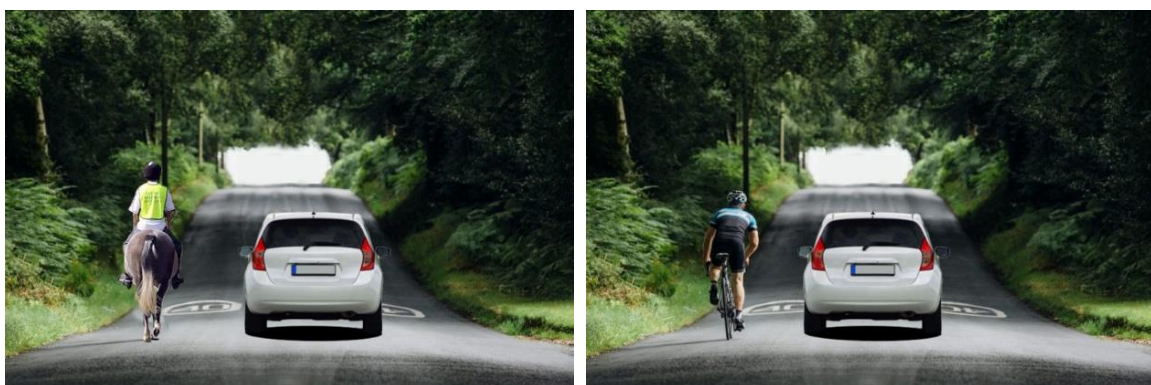


Figure 1. Participants were presented with either a picture of a car overtaking a horse and rider, or a cyclist. A slider allowed participants to both move the car to the left or right in the image to reflect their chosen passing distance, and to select a passing speed of up to 50 mph.

3. Results

3.1 Demographics

Of the 224 participants in the follow-up study, 117 were male and 107 were female. The age distribution of the original study and the follow-up study is shown in Figure 2. The current subsample of the original sample reflects a reduced positive skew, with an increase in the average participant age from 40.2 years to 45.0 years.

For the participants who watched the cycling videos, the average time between the original study and the follow-up study was 466 days for the control group and 469 for the intervention group. For the study involving the horse videos this was 473 days for the control group and 477 days for the intervention group.

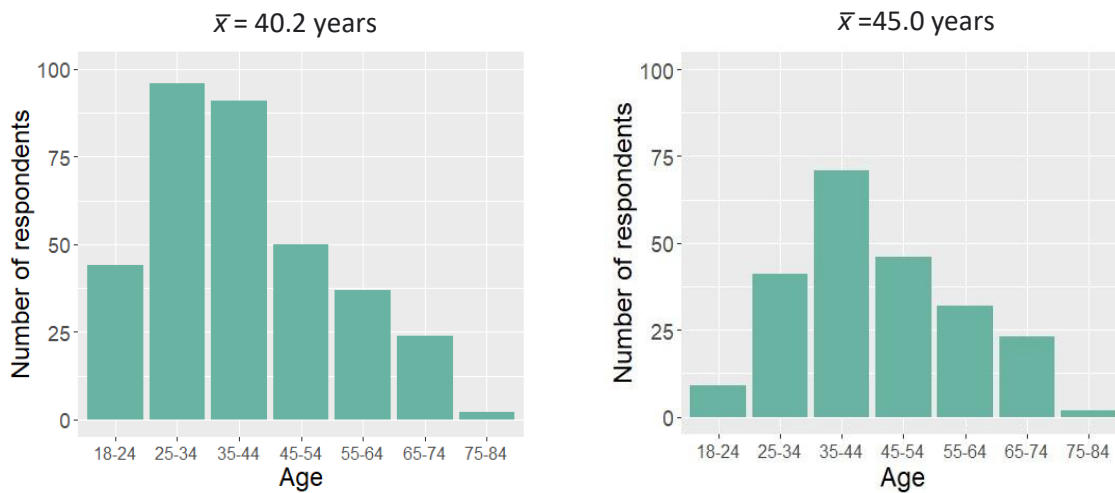


Figure 2. Age distribution for the original study (left) and the follow-up study (right)

3.2 Explicit attitudes

Participants' ratings of agreement with the ten explicit-attitude statements were combined to create two overall ratings reflecting their explicit attitudes towards horses and riders, and towards cyclists (with 5 questions contributing to each mean rating). Where necessary, individual question ratings were reverse coded such that a score of 1 always reflected a strongly negative attitude and a score of 5 always reflected a strongly positive attitude (see Table 2).

Scores for our current sample (at T3) were compared to the scores recorded by the same individuals at T1 and T2 in a series of 2x3 Analyses of Variance (control group/intervention group x T1/T2/T3). The same analysis was conducted four times: Attitudes towards horses were compared across the control and intervention groups for participants who watched the horse videos (Figure 3, panel A), and participants who watched the cycling videos (Figure 3, panel B), while attitudes towards cyclists were also compared across the control and intervention groups for participants in the horse video study (Figure 3, panel C) and in the cyclist video study (Figure 3, panel D).

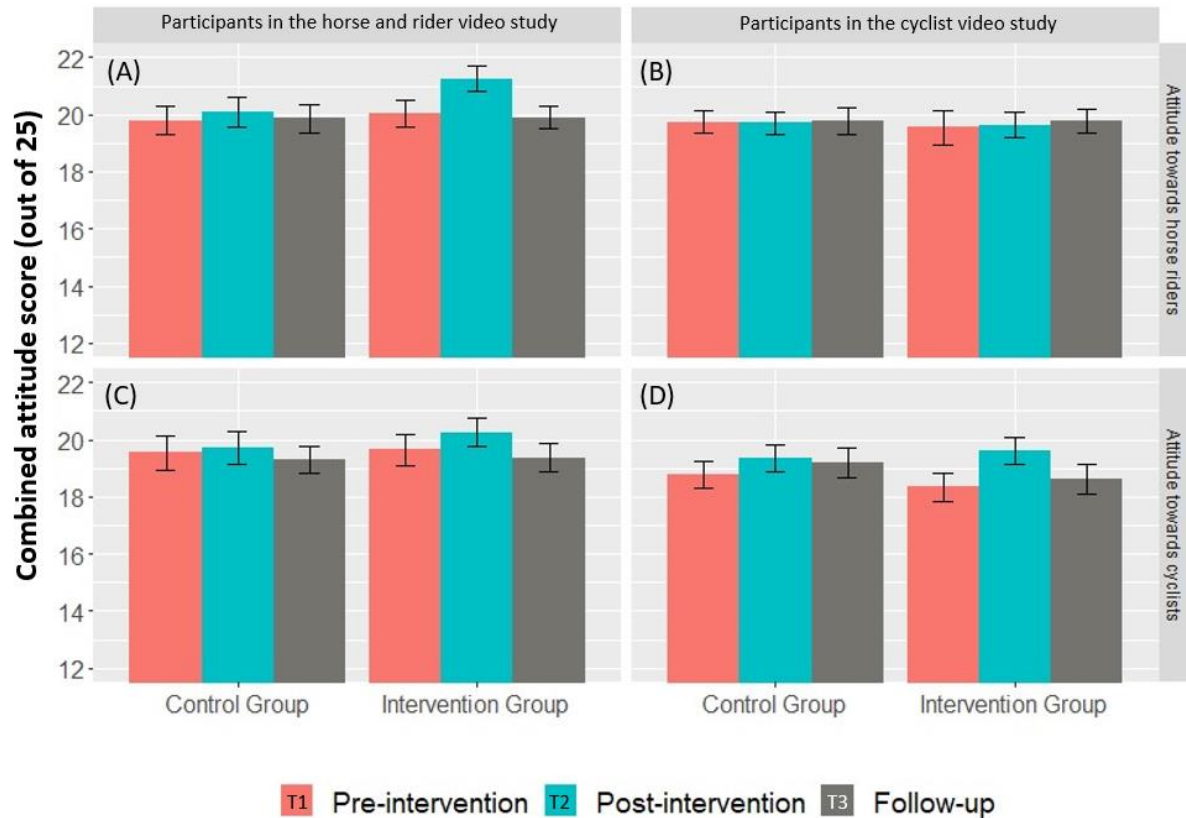


Figure 3. Combined explicit attitudinal scores towards horses and riders of (A) participants in the horse and rider video study, (B) participants in the cyclist video study, and (C) combined attitudinal scores towards cyclists of participants in the horse video study, and (D) attitudes towards cyclists of participants in the cycle video study.

The 2x3 analysis of attitudes towards horses for those participants in the horse video study, revealed a main effect of *Time* ($F_{(2,192)} = 4.78, p = .01, \eta^2 = 0.047$), though there was no effect of *Group*, nor an interaction between the two variables. When the same participants' attitudes towards cyclists were compared, no main effects nor an interaction was found.

For those participants in the cyclist video study, the 2x3 comparison of attitudes towards cyclists revealed a similar main effect of *Time* ($F_{(2,248)} = 8.31, p < .001, \eta^2 = .063$), though yet again there was no effect of *Group*, and no interaction between the two variables. When these participants' attitudes towards horses were compared, no main effect or interaction was found. This is understandable as these participants were not exposed to any video that aimed to improve attitudes towards horses and riders.

The lack of interactions suggests that there is no overall benefit of the two interventions on subsequent explicit attitudes. Not only does this suggest there is no benefit at T3 derived from watching our intervention videos approximately 16 months previously, but it throws doubt on whether there was any beneficial effect at T2 also. While this apparently contradicts the findings of the original study (Crundall and van Loon, 2023), the difference in the results of the two studies is plausible: As the current sample is only a subset of the original sample, it is possible that the original beneficial effect reported previously is not present in the current data set due to the reduced sample size. If this is the case, then we could certainly not expect any preservation of the effect into T3 (as there would be no effect to preserve).

To test this possibility, we excluded T3 data and repeated the above analyses¹. This replicates the analyses conducted in Crundall and van Loon (2023) and allows us to check whether the effects noted in the previous study are also present in the current data set. Four 2x2 ANOVAs (control group/intervention group x T1/T2) found that the immediate attitudinal improvements noted in Crundall and van Loon (2023) were indeed present in this sub-set of data. Attitudes towards horses improved at T2 for those who saw the horse videos compared to controls, as evidenced by an interaction between *Time* and *Group* ($F_{(1,96)} = 6.8, p = .011, \eta^2 = .066$, Figure 3, panel A, columns T1 and T2). Similarly, an interaction confirmed that attitudes towards cyclists improved at T2 for those who saw the cycling videos ($F_{(1,124)} = 6.2, p = .014, \eta^2 = .048$; Figure 3, panel D, columns T1 and T2). Watching the horse videos did not however improve attitudes towards cyclists (no interaction is present in Figure 3, panel B, columns T1 and T2)², nor did watching the cycle videos improve explicit attitudes towards horses (no interaction is present in Figure 3, panel C, columns T1 and T2). These sub-analyses suggest that the current sample is representative of the larger data set collected by Crundall and van Loon (2023) as the pattern of improvements is replicated.

For completeness, a second series of 2x2 sub-analyses was conducted¹, comparing T1 with T3 across the intervention and control groups. No main effects or interactions were found. Overall, these results suggest that while our intervention videos have a mode-specific beneficial effect on explicit attitudes immediately after watching the videos (the influence of which can be seen in the mains effects of *Time* found in the 2x3 analyses for panels A and D), the beneficial effect disappears at T3.

3.2 Passing distances

Participants' responses to the passing distance question were scored on a scale from 1 to 7, with higher numbers reflecting greater distances given to the bicycle or horse. A 2x3 mixed ANOVA compared passing distances from a horse across the two groups in the horse video study and across the three time periods (Figure 4, left panel). A main effect of *Time* was revealed ($F_{(2,192)} = 4.79, p = .009, \eta^2 = .048$), and there was an interaction between *Time* and *Group* ($F_{(2,192)} = 3.75, p = .03, \eta^2 = .038$). To explore the interaction, planned sub-analyses were undertaken to compare T1 to T2 across *Group*, and T2 to T3 across *Group*.

The T1/T2 comparison produced a significant interaction ($F_{(1,96)} = 13.98, p < .001, \eta^2 = .127$) which was driven by the increase in passing distance chosen by participants in the intervention group after watching the videos. This replicates the interaction that was noted in the full data set (Crundall and van Loon, 2023). However, the T1/T3 comparison produced no main effects, nor an interaction. This suggests that the beneficial effect of watching the horse videos is lost by T3.

The same analyses were then undertaken for participants who were in the cycling video study. A 2x3 mixed ANOVA compared passing distances from a cyclist across the two groups. A main effect of *Time* was revealed ($F_{(2,248)} = 7.56, p < .001, \eta^2 = .057$), suggesting a general increase in passing distance over time, but the interaction was not significant. The planned 2x2 sub-analyses revealed an interaction between T1/T2 and the two groups ($F_{(1,124)} = 5.22, p = .024, \eta^2 = .040$) again

¹ All sub-analyses were planned in advance of any statistics being conducted.

² When the horse rider study participants' attitudes towards cyclists were compared, a main effect of *Time* was found when comparing T1 and T2, $F_{(1,96)} = 7.78, p = .006, \eta^2 = 0.075$, but the interaction was non-significant. This suggests that there was a general improvement in attitudes towards cyclists that was due to factors other than the intervention.

replicating the beneficial effect noted in Crundall and van Loon (2023). The T1/T3 comparison did not reveal an interaction across the two groups, though a main effect of *Time*, $F_{(1,124)} = 9.66$, $p = .002$, $\eta^2 = .072$, was present. This suggests that the immediate beneficial effect of watching the cycling videos on subsequent intended passing behaviour is no longer present at T3, though there is general improvement in passing distance at T3 compared to T1 regardless of whether participants watched the cycling videos.

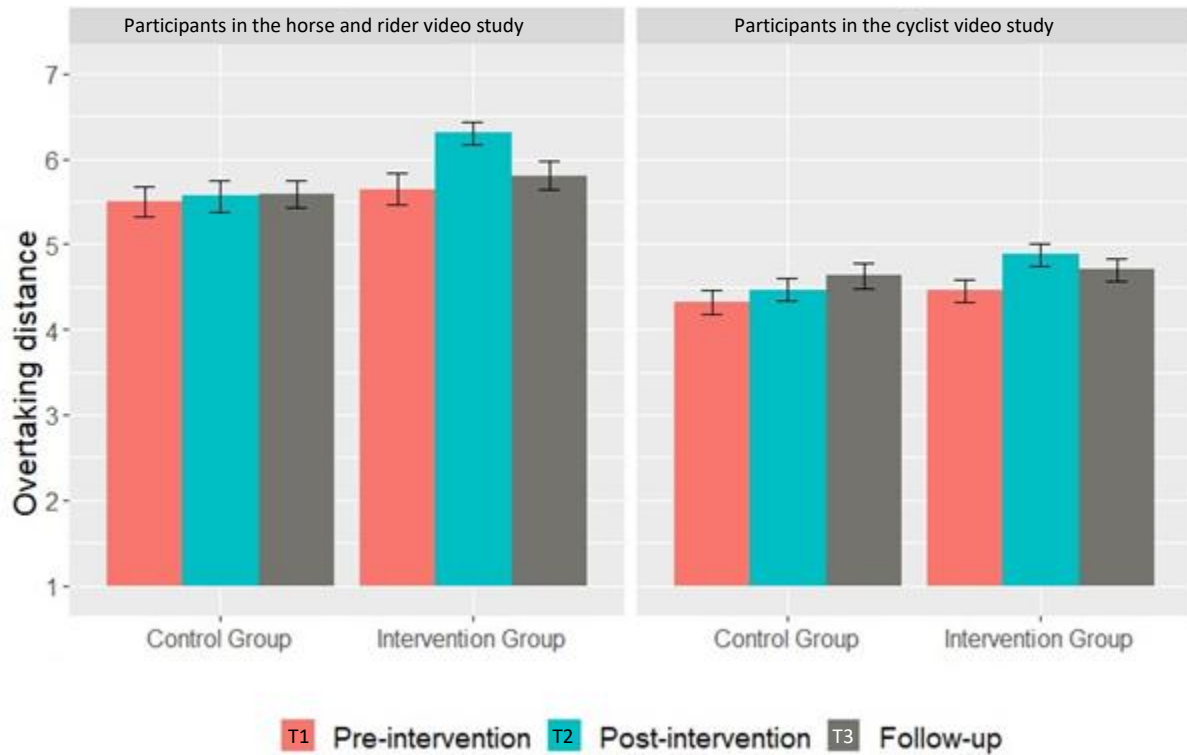


Figure 4. Passing distances selected by participants in the horse and rider video study for overtaking a horse (left panel), and passing distances selected by participants in the cyclist video study for overtaking a cyclist (right panel).

3.3 Passing speeds

Participants' speed choice for the overtaking scenario were reported on a 1-50 mph scale, though note that the image used for the scenario had road markings indicating a 40-mph limit (Figure 1). A 2x3 mixed ANOVA compared speed choice when passing the horse across the two groups in the horse video study and across the three time periods (Figure 5, left panel). A main effect of *Time* was revealed ($F_{(2,192)} = 5.14$, $p = .007$, $\eta^2 = .051$). There was no main effect of group, nor an interaction. To check whether the original effect of reduced speed at T2 was present in the current data set (Crundall and van Loon, 2023), a planned 2x2 sub-analysis was undertaken to compare T1 to T2 across *Group*. This produced the expected interaction, demonstrating that the current data set reflects the original data collected by Crundall and van Loon ($F_{(1,96)} = 7.48$, $p = .007$, $\eta^2 = .072$), with intervention participants choosing a lower speed at T2. Despite a trend in the desired direction, the planned 2x2 sub-analysis for T1/T3 across *Group* failed to reach the threshold of a significant interaction ($F_{(1,96)} = 2.69$, $p = .10$, $\eta^2 = .027$).

When a similar set of analyses were conducted on the passing speeds chosen by the participants in the cyclist video study (Figure 5, right panel), a main effect of *Time* on speed choice was found

($F_{(2,248)} = 3.82, p = .023, \eta^2 = .030$), with a notable dip in speeds at T2 for both groups. The interaction was not significant, however. When subjected to a 2x2 sub-analysis (T1/T2 across *Time*) only the main effect of *Time* was significant ($F_{(1,124)} = 15.52, p < .001, \eta^2 = .11$), confirming that all participants chose slower speeds at T2. The lack of an interaction suggests that the speed choice data for the cyclist scenario were the only data not to follow the pattern of results found in Crundall and van Loon. Without a beneficial effect of the cycling video on speed choice at T2, it was unsurprising to find that the T1/T3 comparison also failed to find a significant interaction across *Group*.

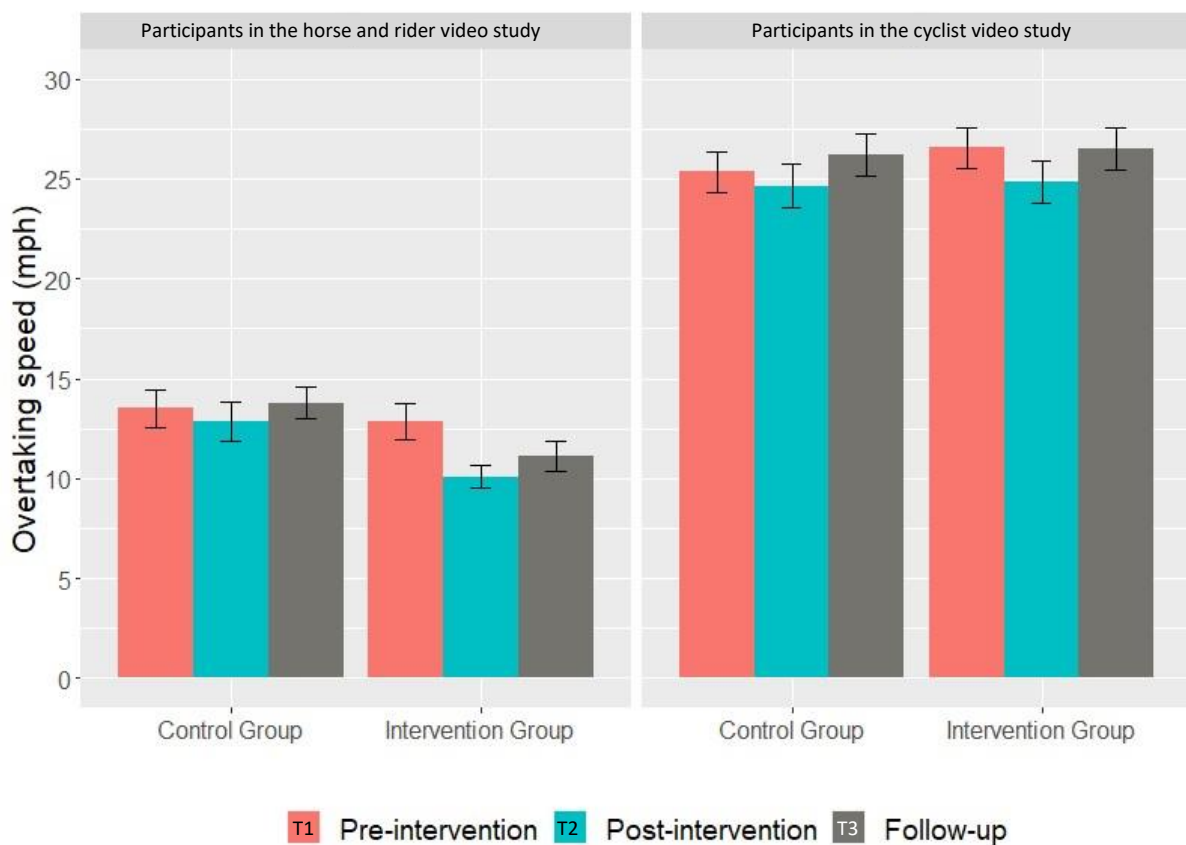


Figure 5. Speed choice of participants in the horse and rider video study for overtaking a horse (left panel), and speed choice of participants in the cyclist video study for passing a cyclist (right panel).

4. Discussion

The current study was a follow-up to Crundall and van Loon (2023) who found empathy-evoking videos to improve explicit attitudes, intended passing distances, and speed choice when overtaking a horse and rider or a cyclist. While an immediate improvement in these measures were found to be effective in the original study, we acknowledged that the question remained whether the effects would persist over time. This follow-up study was undertaken to answer that question.

Eighty-four percent of the sample reported in Crundall and van Loon (2023) were recruited through a paid participant panel which allowed us to invite these participants to the follow-up study nearly 16 months later. A total of 224 participants undertook the follow-up study providing *Time 3* (T3) to complement data recorded from the same participants in the previous study at T1 (before the intervention) and T2 (after the intervention). The percentage of participants in the follow-up compared to the original data set was a respectable 65%. Only T1, T2 and T3 data for these 224 participants were analysed in the current study.

All analyses failed to reveal any interaction that would be indicative of a preserved effect³. Planned sub-analyses demonstrated that in all cases bar one, the beneficial effects noted in Crundall and van Loon (2023) were still present in the reduced data set (the only T1/T2 interaction that was not significant was for speed choice when overtaking cyclists). However, further T1/T3 comparisons confirmed that none of the T3 measures differed from T1 measures, regardless of which videos participants watched.

From these data we can conclude that, while the beneficial effects of the videos are present immediately following exposure, these benefits are no longer significant nearly 16 months later. Unfortunately, we cannot say at what point in the 16-month lag between T2 and T3 the effects disappeared. While it is likely the T2 effects persisted for some time, we cannot say whether this is days, weeks, or months.

One positive to take from these data is that there is no evidence of a negative rebound, where attitudes or intentions at T3 are statistically significantly worse than those collected at T1 (Poulter and Mckenna, 2010; Mayhew et al., 1998). When compared to a suitable control group, such effects demonstrate the possibility that interventions can have deleterious results on target measures.

Obtaining follow-up data should be considered best practice in studies of attitudinal change, though often such data are not collected. Unfortunately, lack of follow-up data has been noted by researchers across many domains (e.g., Patafino, et al., 2021, Chua and Shorey, 2021, Box and Dorn, 2023). When follow-up studies are conducted however, data often reflect a similar deterioration in attitudinal change over time as noted in the current study. Such deterioration is not limited to the driving domain (e.g., Poulter and Mckenna, 2010) but has been found in interventions across fields of research as diverse as attitudes towards concussion in sport (Conaghan, et al., 2021), gendered stereotypes (Stewart et al, 2021), sexual consent and rape (Davis and Liddell, 2002).

The current results raise the question of whether an intervention with only a short-term influence on attitudes and future intended behaviours is worth undertaking. Given the rate of death, injury and near collisions that vulnerable road users endure, even a short-term effect may prevent a collision in the days immediately following exposure.

Beyond the immediate effect however there is the potential of building upon and reinforcing positive benefits with additional multimedia support. The most effective interventions for behavioural change use multiple delivery mechanisms to reinforce key messages (Storey et al., 2011). For instance, the current video intervention may have been more effective if it was reinforced by a radio campaign. Radio messages have several advantages as an addition to a safety campaign: they are cheaper to produce than video interventions, they provide an alternative route to the target audience, and they are often heard by listeners while they are driving a car (Gov.uk, 2022).

³ Passing distances when overtaking horses did produce an overall interaction, but the sub-analyses revealed that this was due to the difference between T1 and T2 in the intervention group. Passing distances at T3 did not differ from T1.

Providing a road safety message while the listener is in the driving context provides a greater opportunity for the message to resonate with the recipient.

In conclusion, the current study did not provide evidence for the persistence of beneficial effects noted in Crundall and van Loon (2023) nearly 16 months after first exposure, though neither did it have any negative effects on attitudes and intended behaviours relative to baseline. Immediate benefits are a good start to any safety campaign, but long-term effectiveness likely requires repetition of the message through different media.

5. References

- Box, E., and Dorn, L., (2023). A cluster randomised controlled trial (cRCT) evaluation of a pre-driver education intervention using the Theory of Planned Behaviour. *Transportation Research Part F: Traffic Psychology and Behaviour.*, 94, 379-397.
- Chua, J., X., Y., and Shorey, S., (2021). Effectiveness of end-of-life educational interventions at improving nurses and nursing students' attitude toward death and care of during patients: a systematic review and meta-analysis. *Nurse Education Today*, 101, 104892.
- Conaghan, C., Daly, E., Pearce, A. J., King, D., A., and Ryan, L., (2021). A systematic review of the effects of educational interventions on knowledge and attitudes towards concussion for people involved in sport - Optimising concussion education based on current literature. *Journal of Sports Sciences*, 39, 5, 552-567.
- Crundall, D., & Van Loon, E. (2023). Improving attitudes towards vulnerable road users. *Accident Analysis & Prevention*, 184, 107006.
- David, T. L., and Liddell, D. L., (2002). Getting inside the house: The effectiveness of a rape prevention program for college fraternity men. *Journal of College Student Development*, 43, 1, 35-50.
- Mayhew, D. R., Simpson, H. M., Williams, A. F., & Ferguson, S. A., (1998). Effectiveness and role of driver education and training in a graduated licensing system. *Journal of Public Health Policy*, 19, 1, 51-67
- Patafino, B, Miller, P., Baldwin, R., Taylor, N., and Hyder, S., (2021). A systematic mapping review of interventions to improve adolescent mental health literacy, attitudes and behaviours. *Early Intervention in Psychiatry*, 15, 1470-1501.
- Poulter, D. R., and McKenna, F. P., (2010). Evaluating the effectiveness of a road safety education intervention for pre-drivers: An application of the Theory of Planned Behaviour. *British Journal of Educational Psychology*, 80, 2, 163-181.
- GOV.UK (2022). Digital radio and audio review.
<https://www.gov.uk/government/publications/digital-radio-and-audio-review/digital-radio-and-audio-review> (last accessed 16/10/23).
- Stewart, R., Wright, B., Sith, L., Roberts, S., and Russell, N., (2021). Gendered stereotypes and norms: A systematic review of intervention designed to shift attitudes and behaviour. *Heliyon*, e06660 (online early access).

Storey, D., Lee, K., Blake, C., Lee, P., Lee, H-Y., and Depasquale, N., (2011). Social & Behavior Change Interventions Landscaping Study: A Global Review. Technical report for the Bill and Melinda Gates Foundation.