Safe Drive Stay Alive Road Safety Intervention for Young People: A Process and Outcome Evaluation

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Abstract

Background: Road traffic collisions (RTCs) are the leading cause of deaths for young people worldwide. Whilst educational interventions that adopt fear-based messaging are commonly used to improve road safety in young people, limited focus has been directed to examining how they are delivered. Accordingly, this mixed-method study aims to i) measure the effectiveness of a UK intervention called Safe Drive Stay Alive (SDSA) for improving road safety knowledge, attitudes and intentional behaviors, and ii) what design and delivery mechanisms are important for achieving this.

Methods: In study one, participants completed online questionnaires that measured road safety knowledge, attitudes, and behavioural intentions pre- (n = 1304) and post-intervention (n = 407), and two months later (n = 72). In study two, focus groups were conducted with 10 young people post-intervention to understand what mechanisms were important for promoting road safety.

Results: Statistical analysis of questionnaires showed that road safety knowledge, attitudes, and intentional behaviours significantly improved post-intervention. However, descriptive comparisons of the smaller number of two-month follow-up questionnaires indicated that ratings returned to pre-intervention levels. Thematic analysis of focus groups highlighted that having emotive, realistic, and relatable content was important for encouraging young people to attend to the message. However, more focus was needed on how to address peer pressure.

Conclusion: SDSA improves road safety knowledge, attitudes, and behavioural intentions. However, there are indications that benefits may be short lived, requiring 'top up' interventions. Whilst young people also perceive SDSA to be useful, engaging, and delivering an important message, support is needed for addressing peer pressure.

Keywords: Road safety education; Young people; Fear-based messaging; Safe Drive Stay Alive; Road traffic collision; Evaluation

1. Introduction

Road traffic collisions (RTCs) are the leading cause of death worldwide for young people (World Health Organization, 2018). Drivers between the ages of 17 and 24 are at increased risk of being involved in an RTC (Department for Transport [DfT], 2015; Klaitman et al., 2018). Indeed, despite making up only 7% of UK license holders (Driver & Vehicle Licensing Agency, 2019), they represent 21% of all drivers killed or seriously injured (DfT, 2018). Evidence highlights various physiological, behavioral, and environmental explanations for this. For example, the brain areas responsible for regulating impulsive behavior, emotional arousal, and anticipation of consequences do not reach maturity until people are in their mid-twenties or older (Griffin, 2017). Young people are also more susceptible to the social influence of peers (Cassarino & Murphy, 2018). These factors can make them more likely to take risks and engage in dangerous behaviours such as drink-driving (DfT, 2023), using mobile phones whilst driving, and speeding (UK Parliament, n.d.). In addition, young drivers have less experience with identifying and responding to hazards and are more likely to drive at night, with poor lighting making hazards difficult to spot (Royal Automobile Club, 2023).

Various initiatives have been developed that seek to improve road safety in young drivers. Some adopt an incentive-based approach, such as pay-as-you-drive insurance schemes that reward young people with discounts for staying within the speed limit. These schemes have been found to significantly reduce speeding violations in Denmark (Bolderdijk et al., 2011) and the US (Mortimer et al., 2018). Similarly, incentive-based smartphone application systems have been found to reduce the likelihood of young people using mobile phones whilst driving (Henk et al., 2021). In addition, graduated driver licencing schemes that adopt a tiered approach to granting a full license have also been found to reduce crash rates (Porchia et al., 2014). Overall, evidence suggests that incentive-based schemes are beneficial for promoting safer driving behaviours in young people. However, such schemes come with financial implications and are not widely used.

A more common approach that is used in many counties is education-based road safety initiatives, which are usually delivered to young people through schools or colleges. These initiatives seek to provide knowledge and information that promotes safer driver attitudes and behaviours. Some adopt a positive messaging approach, using humour, empathy, role-modelling, compassion, optimism, and hope to highlight positive outcomes that result from engaging in safer behaviours (Nabi, 2002; Nabi & Myrick, 2018; Zhao et al., 2019). However, most education-based initiatives adopt a fear messaging approach, focusing

on the devastating consequences of risky driving behaviour. The assumption is that creating a sense of fear will attract the attention of young people and motivate them to alter attitudes and intentions toward engaging in risky driving, encouraging safer driving (Lewis et al., 2008; Tay & Watson, 2002; Thompson et al., 2009).

Research examining the impact of different education-based road safety interventions is often framed by the Prototype Willingness Model (PWM) (Rodwell et al., 2023). This modified dual process model argues that adolescents' health risk behaviour is often not reasoned or planned but a reaction to risk conducive social situations (Gerrard et al., 2008). In the analytical reasoning pathway, behavioural intentions are viewed as a proximal antecedent to behaviour that vary as a function of attitudes and injunctive norms (social expectations). The social reaction pathway varies as a function of perceived vulnerability (chance of experiencing a consequence for engaging in a behaviour), descriptive or social norms (perceptions regarding how people behave), and prototypes (perceptions of the type of people who engage in a behaviour). Accordingly, studies examining the efficacy of road safety interventions usually seek to measure changes in knowledge of driving related risks, attitudes toward risky driving behaviour, social norms regarding peer behaviour, and intentions to engage in risky driving behaviour.

The findings of this body of research suggest that, despite fear-based interventions being the most commonly used approach, their efficacy is limited (Box & Dorn, 2023; Cutello et al., 2020a). When delivered in person, these interventions can have a small positive effect on road safety knowledge, attitudes, social norms, and behavioural intentions, but this is short-lived (Bojeson & Rayce, 2020; Carey et al., 2013; Cutello et al., 2020b; Dale et al., 2016; Hardeman et al., 2002; Poulter & McKenna, 2010; Road Safety Analysis, 2020; Symons et al., 2011). Fear-based video interventions show even fewer benefits (Berlin et al., 2016; Markl, 2016). Concerningly, some studies have found young people reporting riskier driving attitudes and behavioural intentions following fear-based interventions compared to control groups or alternative interventions (Cutello et al., 2020a; Glendon et al., 2014). Researchers have argued that fear appeals may create defensive reactions, with young people seeking to avoid threatening information or rejecting messages (Brown & Locker, 2009; Kempf & Harmon, 2006). Nevertheless, limited research has been directed toward understanding why fear-based interventions may have limited, short-lived benefits.

In contrast, evidence suggests that positive messaging interventions may be more promising. Findings show these interventions to be more effective at reducing risky driving behaviours, with small positive effects regarding knowledge, attitudes, and behavioural

intentions lasting longer than with fear-based approaches (Box & Dorn, 2023; Cutello et al., 2020b; Zhao et al., 2019). Indeed, young drivers perceive an empathy-driven approach that emphasises the consequences of behaviour for others to be the most effective for discouraging drink driving (Santa & Cochran, 2008). Researchers have theorised that positively framed interventions may help to provide new focus on an issue that has become overly familiar, encouraging young people to reframe and reconsider issues previously viewed as irrelevant (Nabi, 2002; Nabi & Myrick, 2018).

Overall, whilst there has been a growth in research focusing on education-based road safety interventions, much of this evidence has been questionnaire-based, measuring changes in road safety knowledge, attitudes, social norms, and behavioural intentions pre- and post-intervention. However, limited focus has been directed toward understanding what aspects of these intervention are important for achieving positive changes and why. Such information is important for understanding what design and delivery mechanisms are needed to achieve positive change, both in the short and long term. Similarly, much of the questionnaire-based research has focused specifically on driver behaviour without considering the role young people play as passengers on influencing driver behaviour. With research highlighting that young people are more susceptible to the social influence of peers (Cassarino & Murphy, 2018), this is an important component for promoting road safety.

1.1 Current study

The following study focuses on Safe Drive Stay Alive (SDSA), a UK-based road safety intervention aimed at young people between the ages of 15-20 years. We focus on the delivery of this intervention in Greater Manchester by the Safer Roads Partnership comprised of emergency services, National Health, and Transport for Greater Manchester. SDSA adopts a fear-based approach, with each 90-minute session consisting of a series of short, emotive films delivered by casualties and family members affected by RTCs, and live presentations from emergency responders. The intervention seeks to improve knowledge regarding road safety, and attitudes and intentions toward engaging in risky driver and passenger behaviour.

The effectiveness of SDSA has previously been examined using within and between subjects designs (Dale et al., 2016; Poulter & McKenna, 2010; Symons et al., 2011), and control groups (Road Safety Analysis, 2020). Findings consistently show small positive effects but, as with other fear-based interventions, these are short-lived. Whilst positive effects are present at two weeks (Symons et al., 2011), evidence indicates they are no longer present three (Dale et al., 2016) and five months later (Poulter & McKenna, 2010). However, unlike many other road safety initiatives, SDSA has introduced focus on the role of

passengers in road safety. Accordingly, this mixed-method paper seeks to contribute to knowledge by examining the effectiveness of SDSA for improving knowledge, attitudes, social norms, and behavioural intentions in relation to both driver and passenger behaviours (study one). We also seek to examine what design and delivery mechanisms are important for achieving programme aims, why, and how the intervention could be improved (study two).

2. Study one

2.1 Method

2.1.1 Design

As withholding a potentially beneficial intervention would be unethical, a quasi-experimental time-series design was implemented to examine the impact of SDSA (Sullivan-Bolyai & Bova, 2014). Electronic questionnaires were administered at three time points: i) immediately before attending SDSA (pre), ii) immediately after attending SDSA (post), iii) a minimum of two months post attendance (follow-up). To allow responses to be linked to the same individuals, participants generated a unique six-digit code that was then used for each survey. The independent variable was time point (pre, post, follow-up). The dependent variables were: i) behaviour as a driver, ii) driving behaviour of friends, iii) knowledge of risks and safety, iv) knowledge of impact as a driver, v) knowledge of impact as a passenger, vi) knowledge of consequences.

2.1.2 Participants

In total, 2974 young people started to complete one of the electronic questionnaires (pre = 2295; post = 594; follow-up = 85). However, 1220 responses were excluded due to participants not completing at least one sub-scale (n = 1195) or being over the age of 20 and therefore falling outside the intervention target population (n =15). This resulted in 1796 responses being included in analysis (pre = 1304; post = 407; follow-up = 72). Participants were asked to provide demographic information in the pre-event questionnaire only; these details are provided in Table 1.

Table 1.

Age (years)	Gender	Driving status
16 (n=678)	Female (n = 702)	Driver (n = 75)
17 (n=430)	Male (n = 570)	Learning (n = 315)

Demographic information for participants who completed the pre-survey.

2.1.3 Materials and procedure

SDSA sessions were delivered to 55 schools, colleges, and alternative education providers from across nine regions of Greater Manchester throughout November 2023. In total, 8,000 young people attended one of the 20 sessions delivered in a large arena. All of these young people were invited to participate in the study. Electronic questionnaires were accessed using a QR code that was distributed to education providers to share with students. The pre-event questionnaire was completed on coaches whilst waiting to enter the venue. The post-event questionnaire was completed on the return journey. The follow-up questionnaire was distributed via e-mail to education providers to share with students two months following the event. Two reminder e-mails were sent over a two-week period to encourage participation in the follow-up questionnaire. Questionnaires took less than 10 minutes to complete.

Questionnaires were designed to test elements of the Prototype Willingness Model, which is commonly used in research focusing on the efficacy of road safety interventions (Rodwell et al., 2023). The pre-, post-, and follow-up questionnaires contained four questions that measured knowledge of responsibilities as a driver/passenger, friends' responses, and ability to challenge irresponsible driving (I am confident that I know my responsibilities as a Driver/Passenger. If I drove sensibly my friends would make fun of me. As a Passenger I would challenge someone who was driving a vehicle irresponsibly.). Participants responded using a five-point Likert scale (1 = Strongly disagree, 5 = Strongly agree).

The pre-, post-, and follow up questionnaires also contained the following six subscales. Scores were totalled and then divided by the number of items to represent an average subscale score.

1. *Behaviour as a Driver Subscale:* This eight-item subscale measured willingness to engage in risky driving behaviours (e.g., "As a Driver/Future Driver how willing would you be do the following?"). Participants responded using a five-point Likert scale (1=Very willing and 5=Very unwilling). The subscale had Cronbach's Alpha Coefficients of >.8.

2. *Driving behaviour of Friends Subscale:* This eight-item subscale measured perceptions of social norms in terms of how willing participants perceived their friends would be to engage in risky driving behaviours (e.g., "As a Driver/Future Driver how willing are your Friends to do the following?"). Participants responded using a five-point Likert scale (1=Very willing and 5=Very unwilling). The subscale had Cronbach's Alpha Coefficients of >.9.

3. *Risks and Safety Subscale:* This 11-item subscale measured ability to perceive driving risks (e.g., "When driving, how safe do you think the following situations are?").

Participants responded using a five-point Likert scale (1=Always safe and 5=Never safe). The subscale had Cronbach's Alpha coefficients of >.8.

4. *Impact as a Driver Subscale:* This 8-item subscale measured participants' ability to identify the impact of engaging in risky driver behaviours (e.g., "If you were doing the following things whilst driving, what are the chances that YOU would have a collision by having your music on full volume?"). Participants responded using a five-point Likert scale (1=Extremely unlikely and 5=Extremely likely). The subscale had Cronbach's Alpha coefficients of >.85.

5. *Impact as a Passenger Subscale:* This five-item subscale measured participants' ability to identify the impact of engaging in risky passenger behaviours (e.g., "If you were doing the following things as a passenger in a vehicle, what are the chances the driver would have a collision?"). Participants responded on a five-point Likert scale (1=Extremely unlikely and 5=Extremely likely). The subscale had Cronbach's Alpha coefficients of >.82.

6. *Consequences Subscale:* This six-item subscale measured ability to identify the consequences of actions (e.g., "If you were to have a collision as a driver how likely are the potential consequences?"). Participants responded on a five-point Likert scale (1=Extremely unlikely and 5=Extremely likely). The subscale had Cronbach's Alpha coefficients of >.92.

In addition, the post-event questionnaire contained eight questions that measured perceptions of how the event had been delivered (e.g., arena venue, length of event, use of films, emergency responder presentations, family speakers) and the impact of this (e.g., benefit of event, changing thinking, changing behaviour). Participants responded using a five-point Likert scale (1 = Strongly disagree and 5 = Strongly agree).

2.1.4 Analysis

None of the questionnaire sub-scales met parametric assumptions. Accordingly, medians were reported for averages and non-parametric tests were used for inferential analysis. Many participants who completed the questionnaire pre-event did not complete it post-event. Accordingly, Mann Whitney U analysis was conducted to compare responses to all pre- (n = 1304) and post-event (n = 407) sub-scales as if they were independent groups. Wilcoxon Signed Ranks was conducted to compare responses for all matched samples for the pre- and post-event sub-scales (n = 175). Of the 72 participants who completed the follow-up questionnaire, a small number completed the pre-event (n = 22) or post-event (n = 11) questionnaires, and only four completed all three questionnaires. Accordingly, inferential

analysis could not be conducted to compare this third time point with the two previous points. Instead, descriptive analysis is used to consider differences in medians.

2.2 Results

Table 2 highlights the median ratings for each sub-scale at the three time points, both for the independent and matched samples. In general, median ratings increased from pre-event to post-event for both independent and matched samples. But ratings for the follow-up questionnaire were more comparable with pre-event ratings, indicating effects may be short lived. Table 2 also shows that ratings such as responsibility as a driver and passenger and behaviour as a driver and passenger were high pre-event, indicating that participants had a good existing knowledge prior to attending the SDSA event.

Table 2.

Sub-scale	Independent samples			Matched samples	
	Pre-event	Post-event	Follow-up	Pre-event	Post-event
	N = 1304	N = 407	N = 72	N = 175	N = 175
Responsibility as a driver	4.0	5.0	5.0	4.0	5.0
Responsibility as a passenger	4.0	5.0	4.0	4.0	5.0
Challenging irresponsible behaviour	4.0	5.0	4.0	4.0	5.0
Behaviour as a driver	3.9	4.0	3.7	3.9	4.0
Risks and safety	3.2	3.4	3.1	3.1	3.4
Behaviour of friends	4.0	4.0	3.9	4.0	4.0
Impact as a driver	3.1	3.8	3.4	3.5	3.8
Impact as a passenger	3.2	3.6	3.0	3.2	3.6
Consequences	3.5	4.0	4.0	3.7	4.2
Friends responses	1.0	1.0	1.0	1.0	1.0

Median ratings for pre-event, post-event, and follow-up subscales.

2.2.1 Pre- and post-event questionnaire comparisons (between subjects)

Mann Whitney U analysis revealed that participants reported significantly greater confidence in knowing what their responsibilities were as a driver (U=172054, p<.001) and as a passenger (U=195982, p<.001) post-event compared to pre-event. Participants were also significantly more willing to challenge irresponsible driving in others (U=183611, p<.001), more able to identify risky driving behaviours (U=143607, p<.001), and less willing to engage in risky driving behaviours (U=141181, p<.001) post-event compared to pre-event. Participants also reported friends being significantly less willing to engage in risky driving behaviours post-event compared to pre-event (U=159672, p.001).

Additionally, participants were significantly better at recognising the negative impact of risks on their driving (U=143213, p<.001), and had greater awareness of the impact of

their behaviours as a passenger on driver safety ($U=118251$, $p<.001$) post-event compared to pre-event. Participants were also significantly more aware of the likelihood of negative consequences arising from involvement in a collision ($U=108494$, $p<.001$) post-event compared to pre-event.

Analysis revealed no significant difference in perceptions of whether friends would make fun of participants if they drove sensibly pre- and post-event ($U=205666$; $p=.33$).

2.2.2 Pre- and post-event questionnaire comparisons (within subjects)

Findings comparing the matched responses were the same as section 2.2.1. Wilcoxon Signed Rank analysis revealed that participants reported significantly greater confidence in knowing what their responsibilities were as a driver ($Z=-.4.85$, $p<.001$) and as a passenger ($Z=-4.07$, $p<.001$) post-event compared to pre-event. Participants were also significantly more willing to challenge irresponsible driving in others ($Z=-6.27$, $p=<.001$), more able to identify risky driving behaviours ($Z=-8.45$, $p<.001$), and less willing to engage in risky driving behaviours ($Z=-3.44$, $p.001$) post-event compared to pre-event. Participants reported friends being significantly less willing to engage in risky driving behaviours post-event compared to pre-event ($Z=-3.17$, $p<.002$).

Additionally, participants were significantly better at recognising the negative impact of risks on their driving ($Z=-2.38$, $p<.02$), and had greater awareness of the impact of their behaviours as a passenger on driver safety ($Z=-4.18$, $p<.001$) post-event compared to pre-event. Participants were significantly more aware of the likelihood of negative consequences arising from involvement in a collision ($Z=-6.50$, $p<.001$) post-event compared to pre-event.

Analysis revealed no significant difference in perceptions of whether friends would make fun of participants if they drove sensibly pre- and post-event ($Z=-1.87$; $p=.06$).

2.2.3 Post event ratings relating to content, impact, and delivery

Post-event, participants were asked to rate their level of agreement with a series of statements relating to the way SDSA was delivered and the impact the event would have on them. Table 3 below highlights the average level of agreement in relation to each statement. Findings indicate that participants held strong positive attitudes towards the delivery and content of SDSA, and perceived that it would affect their behaviour.

Table 3.

Statement	Level of agreement
I feel I have benefited from the event	5.0
The event has changed how I think about being a driver	5.0

I plan to take the learning from the event and apply it to how I behave as a driver/future driver	5.0
A theatre style venue away from school/college provides the best environment to experience the event	5.0
The length of the event was appropriate	5.0
The emergency responders' delivery affected my behaviour	5.0
The family speakers' delivery affected my behaviour	5.0
The film delivery affected my behaviour	4.0

The median level of agreement for post-event survey items relating to content, delivery, and impact.

2.3 Discussion

Overall, findings suggest that SDSA had a significant positive impact on knowledge, attitudes, and willingness to engage in risky driver and passenger behaviours. However, based on the small number of survey responses returned two months later, evidence suggests that this effect may be short-lived, with ratings reducing to pre-event levels. Notably, the only survey rating that did not change across time periods related to how likely friends would be to make fun of participants. However, survey responses revealed that participants did not feel this was likely at any time point.

3. Study two

3.1 Methods

3.1.2 Participants and recruitment

A purposive sampling approach was used to seek feedback from a range of participants. Key points of contact from 15 education providers across Greater Manchester were asked to share an e-mail invitation and information sheet with young people that attended a SDSA session. The e-mail contained details regarding the evaluation and how to sign up for a focus group. A minimum of two reminder e-mails were sent requesting invitations be redistributed. Overall, 10 young people from four regions (Bury, Stockport, Trafford, Wigan) participated. Demographic information is presented in Table 4.

Table 4.

Demographic information for participants.

Age (years)	Gender	Driving status
16 (n= 6)	Female (n = 4)	Driver (n = 2)
17 (n= 4)	Male (n = 6)	Learning (n = 2)
		Plans to learn (n = 5)

3.1.2 Data collection

Five online focus groups lasting between 35-56 minutes (mean = 45 minutes, SD = 6.4 minutes) were conducted. Questions focused on young people's perceptions of SDSA content and delivery, the impact on their attitudes and behaviours, and potential improvements. Questions were designed in consultation with the Safer Roads Greater Manchester Partnership to ensure they focused on issues of practical relevance with regard to understanding what design and delivery mechanisms were important for achieving intervention aims. Steps were taken during focus groups to improve the trustworthiness of the data, including paraphrasing to check researcher interpretation aligned with participant meaning, and asking for concrete examples to sense check (Varpio et al., 2017).

3.1.3 Data analysis

Focus groups were analysed using a data-driven, inductive thematic analysis approach to derive meaning from the data and identify common topics discussed across participants. In line with Braun and Clarke's (2019) framework, the thematic analysis followed six iterative stages: data familiarisation, code generation, initial theme generation, theme refinement, final refinement and defining of themes, and report production (Braun & Clarke, 2019).

3.2 Results

Across focus groups, five reoccurring themes were identified: i) Expectations, ii) Content, iii) Delivery, iv) Learning, and v) Improvements. Each theme was discussed by all participants and there was substantial agreement.

3.2.1 Expectations

Participants discussed their expectations of what the SDSA event would be like prior to attending, and the implications of this for achieving intervention aims. All participants expected the event to focus on raising awareness of the importance of driving safely and practical steps for achieving this. Those who had not yet started driving believed the content would be a useful pre-cursor, whilst those having driving lessons believed the content would add to knowledge being taught by their driving instructor.

> *"I thought the aim was to raise awareness about driving safe. I thought it'd be a great opportunity to learn more how to, you know, drive safe on the road, especially with starting driving lessons."* (P4)

However, a small number of participants had not expected to learn anything new from the event. These young people already perceived themselves to be knowledgeable because they had family members who were driving instructors and provided consistent messaging about the importance of road safety and concrete steps for staying safe. For this small group, there had been an initial barrier to overcome to engage with the event.

> *"I didn't think it would help me much because my parents are driving instructors and have taught me to be safe in a car wherever you're going. No legs on the dashboard, seat belts always on and stuff like that."* (P6)

All focus group participants also anticipated that the event would be a "*dry and boring*" PowerPoint lecture that listed off a series of *"dos and don'ts"* such as *"make sure you wear your seat belt"*. They expected that, whilst the content might be informative, the delivery would be inappropriate for the age group. Had this been the case, participants believed the event would not have been able to achieve its aims as they would have *"switched off"* and *"stopped paying attention"*.

> *"I thought it was going to be like a lecture, someone standing there and talking to you about it, describing basic rules and stuff like that. I'll be completely honest; I was expecting it to be a little bit dry. I didn't think many people would engage with it. I do think, like a lot of people my age would probably get a bit bored of that and not be attentive to it, and it would be a waste of time, really."* (P3)

Participants noted receiving very little information about the emotive and potentially upsetting nature of the content or how the event would be delivered prior to attending. Nevertheless, for these young people, not being provided with a 'trigger warning' worked well for various reasons. For some, the *"shock factor"* kept their focus and made the message more memorable.

> *"I think it has more of an effect when you walk out the theatre and go wow rather than being prepared for it. I wouldn't just go up to year 11 now and say, oh, by the way, Safe Drive Stay Alive that you're probably going to be doing next year is real people, real stories. It would almost be like spoiling it for them. I think you need to keep it shock and awe to create a more permanent memory."* (P7)

Others noted that if they had been pre-warned, they would have emotionally prepared themselves and may have been *"hardened to the message"*. Accordingly, not knowing in advance increased the impact of the session. Participants also noted that some people may not have attended if they had received a trigger warning in advance. However, they were glad they did attend and would want others to do so in future because the message was important.

> *"They didn't tell us a lot, actually. I feel like there was an element of surprise with how traumatic, well, not traumatic, but how emotionally hard hitting it was. That definitely worked better. I feel like other people may have opted out of going to it if they'd known how emotional it was going to be. So, by not telling people as much, more people are going to go and kind of learn the message, right"* (P4)

2.2.2 Content

Discussions also centred on the content of SDSA sessions and the implications of this for achieving intervention aims. A key focus of the content was on raising awareness of the consequences of engaging in risky driving behaviours. For some, this was at odds with initial expectations that the event would list off *"dos and don'ts"*.

> *"I think it was more focused on the stories and the people rather than actually telling us this is how you stay safe; this is what you need to do sort of thing. So, it was more about raising awareness of these are the consequences of not staying safe on the road or not, rather than telling you how to stay safe on the road."* (P5)

Participants were also surprised that SDSA focused on the role of passengers in road safety. For many of these young people, this was the first time they had considered that passengers have a role and responsibility in road safety. In addition, they were surprised to hear the message that road safety is not just about keeping themselves safe, but the impact of their actions on others, including cyclists, pedestrians, and emergency services who respond to RTCs. In this sense, SDSA was able to deliver content that was useful to everyone, even participants who thought the programme would not cover anything they did not already know.

> *"I knew about everything that you can do to keep yourself safe as a driver. But they really emphasised how you as a passenger can affect the driver and what happens as a consequence in the car, which I thought was really important because other people might not know that. It's really hit home that you need to be safe, you need to know exactly how to drive, and that you're not just putting yourself in danger, it's other people in cars and passengers, everything."* (P5)

Sessions included presentations from emergency responders about attending RTCs, in addition to emotive presentations from family members who had lost loved ones due to RTCs. Young people praised those who designed and delivered the event for providing such a realistic and relatable session. This had been important for making sure they engaged with key messages. Hearing about the loss of young people of a similar age had made an impact by emphasising that they were not invincible.

> *"So, one thing that I really liked is that they told us about this girl quite similar to us, she was the same age as us. They told us how she had a lot going for her. She was on the Olympics team. And then all of a sudden because she went into one of her mates cars who's trying to show off, she ended up dying, right. The girl was*

the exact same age as us and she was killed as a result being a passenger in a car

with somebody dangerous. It shows it can happen to anyone, even my age." (P1)

Similarly, having videos and live speakers from the Greater Manchester region made the content more relevant because the young people were familiar with the locations of RTCs and were better able to associate and empathise with those affected. Highlighting that RTCs happened on the roads these young people travelled also helped to emphasise the risks and that incidents could happen to them.

"It was local and had people from the area coming and speaking. I do think them
being local made it a lot better because at some point you just think oh that's
really bad but it's not going to happen near me. But obviously if you have people
from the area explaining their experiences and saying all this happened on such a
road, like one was on the M6, obviously a lot of people go around that motorway.
You think, I've been on that road before and now there's been an awful accident,
oh gosh, it could actually happen to me, like that could have been me. So actually,
it rings a bell for you because you know the areas and you know the roads." (P3)

Participants discussed the value of having emotionally evoking content for highlighting the consequences of engaging in risky driver and passenger behaviours. Being able to relate to both the young casualties and fatalities and regions where incidents happened contributed to this emotiveness. Participants were particularly affected by a presentation provided by a mother who had lost her child in an RTC five years ago and was still being impacted by this. This emotive content encouraged them to reflect on how their own families would be impacted if they were involved in an RTC and emphasised the importance of the message being delivered.

"It was quite personal. I think there were quite a few crying by the end, not
because they were really upset, it was just really emotional and kind of harrowing
to watch these people go through these awful stories and realise how this could
happen to you. You could be an innocent bystander just walking down the street. I
really think that having the personal stories, especially from the mum whose son
was our age you know doing similar things that we would experience was dead.
And a lot of people I think saw their mum like reflected and it definitely hit a
personal chord." (P4)

2.2.3 Delivery

Feedback highlighted aspects of the event delivery including the atmosphere, physical environment, pace, and mode of delivery. Most young people had not expected the event to

be delivered in a large arena and so this created some initial excitement that encouraged them to pay attention from the start of the event. The venue, bright lights, and music playing when they entered the arena also made the young people reconsider their preconceptions that the event would be *"dry and boring"*.

> *"I've never seen the arena before, so I didn't know what to expect and I noticed it was very light, colourful. I was like, oh, if it's in a building like this then it's probably not going to be as dry as I thought it was going to be, right? I mean, I could tell we were all a bit like, oh, what's this? Because obviously we looked at the screens and what was on it, and we were thought it almost looked like a performing theatre. But I could tell, like a lot of people in my year were getting a bit nosy if you get what I mean."* (P3)

However, many highlighted issues with the dance music that was playing upon arrival. Whilst there was an acknowledgement that it would be strange to walk in and sit in silence, the *"upbeat"* nature of the music was perceived as inappropriate for setting the *"event tone"*.

> *"Well, it was actually a bit weird because obviously all the lights were on, and it was flashing. It actually looked quite happy. We started thinking it may be a play. So, we thought, oh, maybe there are going to be some actors up there doing something. But yeah, we thought it was quite happy thing when we walked in there, but the actual music wasn't right."* (P7)

Feedback also focused on the physical environment. Although one participant felt that the delivery of SDSA would be better suited to a familiar classroom setting, all of the other participants felt the session worked well being delivered to a larger audience in an arena environment so that a larger number of people could be reached.

> *"I think like obviously being in an arena, you can fit so many more people in, so you can deliver the message to as many people as you can, which is really important."* (P4)

Similarly, delivering the session to large numbers of people in an arena emphasised how many young people driving around Greater Manchester could be involved in RTCs if they *"did something stupid"*.

> *"I think the big arena style bit probably worked better because it just shows you how many people there are there in your position and in the same position as the people that we're hearing about. So, you know that even though there's only like not enough, there's not a lot of people that were talked about. But, you know,*

there's a lot of people that could be talked about because everyone in that arena
has the same chances of doing something stupid." (P6)

For others, delivering the session to large numbers of people in an arena helped to encourage concentration and engagement because the environment differed to what they were used to.

"Having it in a theatre definitely felt like it improved the concentration of the
people because it's a different environment. You know what I mean? Like, some
school stuff has stuck with me but I remember one time they'll just talk about all
sorts of things, bullying, knife, crime, but none of it would really stick when you
leave the hall." (P8)

Participants also felt that the fast-paced delivery of the session, with speakers and videos playing without any breaks, had been beneficial for maintaining concentration and engagement.

"I think the way they full on put you into it was very effective. You wouldn't have
wanted a break half way through where they distracted you with something else. I
feel like if they did do that, they would have moved away from the message. We
would have relaxed a bit and wouldn't be thinking about it. The way that we
carried on without a break was good because it kept us engaged." (P3)

The mode of delivery was perceived to be engaging, including the use of face-to-face speakers and videos that were recorded specifically for the event. This encouraged young people to concentrate by emphasising the local nature of incidents that could happen to people just like them.

"It sent out the message in a way, in a good way, with the way that you use like
the audio visuals of the videos that this hook and the real-life photos that they use
of people that are like, you know, been in accidents and have had impacts and
that." (P3)

Participants emphasised the benefit of having a range of speakers from both emergency services and those who had been personally affected by RTCs for highlighting the impact. This reinforced the message that engaging in risky driver and passenger behaviour could significantly affect a wide range of people.

"It worked well that they had both emergency services and people who had been
involved in in road incidents or had family members and sort of friends who've
been involved. They had bits where they had a video of interviews done, and
people had done interviews that had like life changing injuries from accidents
caused by young drivers." (P3)

2.2.4 Learning

Each of the focus groups took place between one and two weeks after young people attended a SDSA session. Participants discussed the impact the session had made on them during this period and what they had learned. Most highlighted that attending a session had been beneficial in increasing their awareness of the consequences of engaging in risky behaviours in a vehicle. Even several days later, they were reflecting on their actions more carefully when getting into a vehicle.

> *"I did actually think it met what it was intended to be, which was obviously reduced accidents on the road by educating people. I do think it's met the aim. It has made me stop and think … It was just a bit of a like getting in the car and just thinking that's exactly what the people did that are dead now, you know. It's just a bit shocking."* (P7)

A small number of participants felt they had not learned *"practical tips"* for staying safe because this had previously been enforced by family members. However, they acknowledged that for other young people who do not receive regular messaging about the importance of safe driving, the content would be beneficial for raising awareness.

> *"I don't think I've learned any new practical tips for staying safe because my aunty takes me for driving lessons. So, she teaches me all the stuff like what can go wrong and whatnot. But obviously people that haven't had like been taught what can go wrong and why you do certain things in the car and what the consequences are. I think it helps them. For somebody maybe who's not having lessons, there's some additional things that they get from it."* (P8)

A small number of young people also provided concrete examples of behavioural changes they were making as a result of attending a SDSA session. For example, one participant commented that she was selling her car because it did not have an airbag and she now realised how dangerous this was.

> *"It already has had an impact on me. I'm selling my car as it is unsafe. It doesn't have airbags as it's classic, and one of the videos showed how somebody killed their passenger and permanently disabled themselves through having a classic car in an accident in place of a more modern car."* (P2)

Other young people commented that attending a session had made them feel more confident in challenging friends if they engaged in risky or dangerous behaviours.

> *"I feel like Safe Drive would make you more aware, like if people were sat in the car and saying go faster, you go, no, because last time I saw somebody doing this,*

they're all dead. You know, if they're saying that say, oh go faster, go faster, we'd surely think about our own life more than anything. So, now you just pull over and say, look, if you're like that, just get out of the car and walk home." (P9)

2.2.5 Improvements

Feedback focused on improvements that could be made to future SDSA delivery. This included providing more concrete focus on practical steps for staying safe, particularly with regard to responding to peer pressure. Participants noted that young people their age are generally knowledgeable about the importance of road safety, but peer pressure can make them act counter to this.

> *"A lot of people do stupid stuff to show off and try gaining popularity. I feel like Safe Drive could get a few people to volunteer and then show them how easy it is to be peer pressured to do something. It would be useful to actually role play that and say this is what that situation might look like and what might happen."* (P1)

Feedback also indicated that it would be beneficial to have more direct and explicit focus on other actions that young people should take to be safe as both a driver and passenger.

> *"I think more focus on exactly what you need to do as a driver and passenger to be safe on the roads. There was so much focus on hearing all these stories that he got in a crash because he didn't put his seat belt on, or he was drink driving. There wasn't explicitly don't drink, you know, put your seat belt on. I think there needs to be more emphasis on that for people who aren't able to infer from the stories what they did wrong and how to prevent that from happening to yourself or the people."* (P4)

In addition, feedback from a small number of participants highlighted that the message was important for all drivers, and it would be useful if sessions were delivered to everyone. They recognised the difficulty of achieving this and suggested that sessions be delivered to people who are about to take/re-take a driving test.

> *"I think the message should resonate with all age groups and obviously over time all the age groups who have been driving for ages. So, if you have to retake your driving test to make sure your eyesight and stuff. At times that maybe then there should be some sort of intervention session where they as part of redoing their driving test, they have to go to one of these sessions. It's relevant to everybody, but actually at a point in time when you're either learning to drive or you need to take a retest, it's a refresher and a reminder for do you know what you really need to think about steps to stay safe when you're driving."* (P5)

Another suggestion was the need to focus on young people up to the age of 25 years because people in their early 20s are still at greater risk of being involved in an RTC. Participants also noted that this age group may even be at greater risk because they are able to afford cars with more powerful engines than people in their late teens, creating additional speed-related risks. They noted that it would be beneficial to identify alternative avenues in addition to school or college for providing access to SDSA for young people in their early 20s.

> *"Do they deliver it to sort of older groups? Maybe like maybe like 25-year-olds. I know a few people that age who have got the money to get a faster car than our age. So, maybe design like a program for them."* (P10)

A small number of participants commented that it would be beneficial to see more emotional responses from emergency services. For some, there was a sense that it would help to emphasise the scale of the impact that an RTC can have.

> *"I don't know if it's just me, but I think maybe a bit more shock and awe from the ambulance and fire and rescue because I know they gave like a bit of a talk of what they see on a day-to-day basis, but more of like a visual representation if it's possible so that you could sort of see how it affects them as well. And also, what it's actually like to tend to a scene if you can actually do that so you get to see from their perspective. Listen, this is what we actually turn up to."* (P10)

For others, feedback indicated that some attendees may be considering a career in one of the emergency services. By discussing the emotional impact of attending RTCs, emergency responders could help to highlight the reality of these careers so that people who pursued this route are those more likely to be able to handle the realities of the job.

> *"Maybe have a bit more in depth stories from the people who deal with on a day-to-day basis like your emergency services. Because as well, like, if there's people sat in the audience that want careers and it can help them as well. You've got a room full of people who, some of them might actually be interested in a career in the fire service or with the ambulance service, and that might be a useful way to show them the reality of what that career might look like."* (P9)

Finally, feedback highlighted that whilst the content and delivery of SDSA was effective in highlighting the impact of risky and dangerous behaviours, this message would not reach everyone. A more bespoke *"hard hitting"* delivery would be needed for the smaller number of individuals resistant to the message.

> *"For people that think that it's not enough, maybe more of like a gory more practical sort of thing. Something that maybe is a bit more targeted to smaller*

groups of young people who are practically a bit more resistant to the messages. Like actually getting a physical car and get a firefighter to replicate what they've seen as best they can and then go through what they've seen, and you can get fake limbs and all that and use them. OK, it might be expensive, but something that's maybe a bit more bespoke that would be more shocking again for people who sort of weren't taking the message on board." (P10)

There was also recognition that some people may want to engage in risky behaviours as a reaction to being told not to do it. Feedback suggested that providing a safer outlet for allowing them to express these risky behaviours might be beneficial.

"I think it's more because they've been told they shouldn't do it means that they're more likely to do it. If you're not being exposed to something, you're more curious about it, right? But I guess you can't really say to a kid, yeah, you can go fast just for this one time, and then you can't do it again. So, maybe just give them like alternatives, where they can go and race as fast as they want, like race tracks, karting, something like that, they can get exposed to the feeling of going fast without doing it in a in a car on a road." (P9)

4. Discussion

This study aimed to examine the impact of SDSA on road safety knowledge, attitudes, social norms, and behavioural intentions, and to understand what intervention mechanisms were important for affecting these outcomes. Similar to previous studies focusing on fear-based educational interventions, findings indicate that SDSA is effective at improving road safety knowledge, attitudes, norms, and behavioural intentions (both as a driver and a passenger), but these benefits may be short-lived (Bojeson & Rayce, 2020; Carey et al., 2013; Cutello et al., 2020b; Dale et al., 2016; Hardeman et al., 2002; Poulter & McKenna, 2010). However, young people already possessed a good knowledge of their responsibilities as a driver and passenger pre-event. Accordingly, whilst knowledge, attitudes, and behaviours returned to pre-event levels two months post-intervention, levels were still relatively high.

In contrast to most of the existing evidence regarding road safety interventions, this study also sought to understand how design and delivery mechanisms impact intervention outcomes. This poses implications for understanding why the positive impact of fear-based road safety interventions is short in duration. Previous research has proposed that threat appeals are ineffective, creating defensive reactions in young people so that they seek to avoid or reject the threatening message (Brown & Locker, 2009; Dale et al., 2016; Kempf & Harmon, 2006). However, current findings showed that SDSA had a positive impact, albeit of

short duration. Furthermore, feedback from young people highlighted that the emotionally evoking content was engaging and impactful. Including relatable content, such as focusing on RTCs that happened in the same region and to young people of a similar age to the audience increased the emotive nature of the content. As has previously been suggested (Lewis et al., 2008; Tay & Watson, 2002; Thompson et al., 2009), young people believed this fear-based emotive content encouraged them to attend to the key messages being delivered throughout the event. However, it also encouraged them to personally reflect on their own safety and the impact that their behaviours as a driver and passenger could have on the safety of others.

There may be a number of reasons for why the positive benefits of fear-based messaging interventions are short-lived. According to the Prototype Willingness Model, adolescents' risk behaviours are often not reasoned or planned, but a reaction to risk conducive social situations (Gerrard et al., 2008). Feedback from young people attending a SDSA session supported this argument. Young people noted that although they perceived themselves to already be knowledgeable about the importance of road safety, peer pressure was something that could affect their behaviour in the moment. Indeed, one of their key recommendations for improving the delivery of SDSA was the need to include role play to provide concrete and practical demonstrations for how young people could address peer pressure when they encounter this. Attending a single educational session may be too brief to continually counteract the opposing pressures surrounding road safety, such as the influence of peers or risk-seeking tendencies (Poulter & McKenna, 2010). Additionally, attitudes towards risky driving may become engrained long before reaching the driving age, and therefore the attendance of a road safety intervention at 16 years old may be too late to have an enduring impact (Waylen & McKenna, 2008).

It is also possible that the mechanisms underpinning the influence of fear-messaging may be inconducive to long-term change. Notably, positively framed interventions often produce longer lasting effects regarding knowledge, attitudes, and behavioural intentions around risky driving than negatively framed interventions (Cutello et al., 2020a; Zhao et al., 2019). As both current and previous findings highlight (Lewis et al., 2008), fear-messaging attracts attention and therefore produces immediate effects (Lewis et al., 2008). However, by supporting the reframing of issues that young people have dismissed as irrelevant, positive messaging may promote long-term change (Cutello et al., 2020a). Indeed, whilst SDSA is centred around fear-messaging, it does contain elements of positive messaging such as the use of empathy when considering the impacts of driving behaviour on others. Current findings highlight that these elements of the intervention were particularly powerful for

encouraging young people to reflect on their attitudes and behaviours in relation to road safety. This was achieved through recounting incidents in which passengers had lost their lives due to reckless driver behaviour, alongside presentations from both casualties and family members, and emergency responders who had been affected by RTCs. This promoted empathy by emphasising the number of people who could be affected by how they behaved in a vehicle.

4.1 Limitations and future research

Unfortunately, the response rate to both the pre-, post-, and follow-up surveys, and focus groups was limited, despite the evaluation team sending out multiple requests to schools and colleges. It is unclear whether the lower response rate was the result of schools/colleges not passing on invitations to participate to students, or students not wishing to engage. These issues may have led to an unrepresentative sample and caution is required when interpreting results. However, it is important to note that saturation was achieved in the analysis of qualitative data, with no new themes emerging. In this respect, it is unlikely that new insights would have been gained from conducting further focus groups.

Another key consideration is the lack of a control group, which may have masked potential benefits of the intervention. This is particularly relevant as driving attitudes often become riskier with experience (Rowe et al., 2013), and therefore similarities between pre and follow-up survey responses may reflect the prevention of worsening attitudes and intentions, rather than a lack of impact. Although future evaluations of road safety interventions should not withhold the intervention from young people, researchers may consider recruiting a comparator group who have not received the intervention.

Despite these limitations, the research is strengthened by the use of a mixed-method approach to examine both SDSA processes and outcomes. Accordingly, conclusions extend beyond the effectiveness of the intervention to determining design and delivery mechanisms that are important for achieving beneficial outcomes and how these could be improved. Future research should continue to evaluate road safety intervention processes alongside the outcomes, to further understanding of what features of program delivery are important for impact and intentions towards risky driving behaviour.

4.2 Implications

Findings of the current research propose a number of implications for the delivery of future education-based road safety interventions. Firstly, findings suggest the need to introduce interventions to audiences at a younger age, before attitudes toward risky driving behaviour have become engrained. Secondly, findings indicate the need for repeated follow-

up sessions to extend the positive impact of road safety interventions. Such 'top-up' interventions should be delivered within two months of the initial delivery. However, further research is needed to explore the effects of session number or target sample on intervention efficacy directly. Thirdly, future interventions may consider placing greater focus on positive messaging, alongside fear-appeals, to produce both short- and long-term benefits. Fourthly, interventions should include greater focus on peer pressure and providing concrete advice and examples for how young people can respond to this pressure. Finally, whilst many education-based road safety interventions are often delivered across multiple regions, findings suggest the benefits of tailoring such content so that the presentations provided by casualties, family members, and emergency responders relate to the regions in which events are being delivered to increase the relevance to the audience.

4.3 Conclusions

Overall, the current process and outcome evaluation suggests that young people feel that SDSA is a valuable and engaging initiative. Furthermore, findings suggest that SDSA is able to produce short-term improvements in knowledge, attitudes, and willingness to engage in risky driving and passenger behaviours. Feedback suggests that this is achieved by delivering emotive and relatable content that encourages empathy and reflection on personal safety and the impact of driver and passenger behaviours on others. Further research is needed to consider how frequently repeat follow-up sessions would be needed to prolong the positive impact of education-based road safety interventions, and what format these 'top-up' sessions should take.

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