

An elicitation of speeding behaviour beliefs in school zones in Australia

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Abstract

This elicitation study was designed to explore salient behavioural, normative, and control beliefs in accordance with the Theory Planned Behaviour (TPB) and in relation to drivers' speeding behaviour in school zones. The study also explored mindfulness and habit as additional constructs in the TPB framework. The aim of this study was to identify those beliefs which influenced drivers' speeding behaviour in school zones and thus gain greater insight into the motivating factors underpinning the behaviour which may inform interventions to reduce this behaviour. Seventeen Australian drivers participated in one of a series of focus group discussions. Overall, conceptual content analysis revealed some similar issues across the groups. In particular, highlighting the influence of behavioural and normative beliefs, there was much agreement that there were no real advantages to speeding in school zones with the behaviour considered dangerous and unacceptable and likely to also be regarded as such by important others. In addition, given the public concern about safety of school children, acknowledgment of such concern represented an important factor discouraging one's likelihood of engaging in speeding in school zones (i.e., complying with the school zone speed limit). However, despite normative support not to speed, and the need to ensure children's safety as an important factor discouraging speeding, the study also found that there was a tendency for drivers to report unintentionally speeding in a school zone. Instances of unintentional speeding were reported as occurring due to several reasons including a driver's current affective state (e.g., more likely to speed in a school zone if they were in a bad mood), the extent to which they were familiar with the environment (i.e., more likely to drive mindlessly – on 'autopilot' - in more familiar contexts) and when feeling fatigued. The theoretical implications of including mindfulness and habit with TPB constructs and the practical implications in terms of suggested interventions are discussed.

Keywords: School zones, speeding, salient beliefs, elicitation study, Australia

1.0 Introduction

Schools can be considered as a central place for a child's daily activities that are associated with regular, often concentrated and highly congested traffic patterns. In Queensland, school zones usually operate only on a school day when most children are arriving or leaving, and only for the limited geographical area (i.e., minimum length of 200m for 50km/h and 60km/h road) of the school (Queensland Government, 2011b). The peak time for use is during the arrival and departure of school children, specifically, with recent operational changes in Queensland (Queensland Government, 2012) between 7.00 am to 9.00 am and 2.00pm to 4 pm, respectively. A range of measures, such as road markings, school zone signage and zebra crossings have been introduced to improve school zone safety, and these measures have evolved over time as a means of enhancing safety around schools. The aim of such interventions is to reduce vehicle speeds and develop awareness among drivers who pass

through school zones, thus, ultimately providing a safer road environment for school children.

However, the number of drivers being fined for speeding within school zones in Queensland has steadily increased over the past few years: 12,335 drivers in 2009, almost 15,976 in 2010, and 8,822 in the first six months of 2011 (Queensland Government, 2011a). In addition, evidence from Ipswich, Queensland found that 27 percent to 30 percent of drivers exceeded 45km/hr in the morning and afternoon periods when the school zones were in operation (Yarrow, 2006). Similarly, in a New South Wales study Ellison, Greaves and Daniels (2011) found that 23 percent of the distance a driver drives in school zones is above the posted speed limit of 40km/hr.

These findings are cause for concern given the high concentration of young and vulnerable road users in school zones. Thus, it is important to understand the factors underpinning drivers' speeding behaviour in school zones.

2.0 Theory of Planned Behaviour (TPB) and elicitation studies

The Theory of Planned Behaviour (TPB; Ajzen, 1991) has been used widely in social behavioural research and a number of researchers have demonstrated the applicability of the TPB to various road safety-related behaviours including driving violations (Forward, 2006; Parker, Lajunen, & Stradling, 1998; Parker, Manstead, Stradling, & Reason, 1992a), speeding (Elliott & Armitage, 2009; Elliott, Armitage, & Baughan, 2005; Paris & van den Broucke, 2008; Warner & Aberg, 2008; Warner, Ozkan, & Lajunen, 2009), pedestrian behaviour (Evans & Norman, 1998; Holland & Hill, 2007), aggressive driving (Parker, 2004; Parker, et al., 1998), and mobile phone use while driving (Walsh, White, Hyde, & Watson, 2008). Extended versions of the TPB have also been tested as outlined in previous work by the authors (Abdul Hanan, King & Lewis, 2010). The current program of research is aimed at extending the TPB through inclusion of the constructs of mindfulness and habit.

In the TPB, the engagement in a specific behaviour will be predicted by the constructs of attitude, subjective norm, and perceived behavioural control (PBC). Attitude and subjective norms predict behaviour via intention, while PBC is posited as influencing behaviour both indirectly (through intention) as well as directly (Ajzen, 1991). Ajzen (1991) stated that attitudes, subjective norm and PBC are each underpinned by a set of salient beliefs. Specifically, attitudes will be determined by an individual's beliefs about the consequences of his or her behaviour regarding, in particular, the perceived advantages and disadvantages of the behaviour and what are referred to as behavioural beliefs. Subjective norm is determined by the normative beliefs one has about whether significant others (e.g., mother, peers) approve or disapprove of their engagement in the behaviour, while PBC is underpinned by control beliefs regarding an individual's beliefs about their ability to perform the desired behaviour and thus the factors which encourage/facilitate and discourage/impede engagement in the behaviour.

2.1 Additional constructs: Mindfulness and habit

Mindfulness is a concept which has been widely used in study of consciousness, but has only more recently been applied to the understanding of behaviours in other areas, including clinical psychology, meditation, physical activity, education, business, and social behaviour (Baer, 2003; Ludwig & Kabat-Zinn, 2008; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008; Weick & Sutcliffe, 2006). With respect to driving activities, an individual driver needs to be aware of, and attentive to, the present situation around them so that they can reflect on their behaviours and take the right action. Thus, an increase in awareness and attention during driving can decrease the probability of dangerous driving. Drivers who are mindful

may have a lower risk of being involved in a crash. Thus, in this particular study, mindfulness has been described as “enhance[d] attention to and awareness of current experience or present reality”, a definition borrowed from Brown & Ryan (Brown & Ryan, 2003, p. 823) (refer to Abdul Hanan, et al., 2010; Abdul Hanan, King, & Lewis, 2011)

Another construct under investigation in the current research is habit which refers to “learned sequences of acts that have become automatic responses to specific cues and are functional in obtaining certain goals or end-states” (Verplanken & Aarts, 1999, p. 104). It is a frequent behaviour pattern that has become almost involuntary and automatic in achieving certain goals (Verplanken & Aarts, 1999). For instance, when the same behaviour has been performed many times, an individual does not have to weigh up the pros and cons of performing the behaviour in order to make a choice of whether or not to perform the behaviour again (Verplanken, Aarts, & Van Knippenberg, 1997). It also enables an individual to perform actions or behaviour in a quite mindless way. With regard to speeding behaviour, if the behaviours are repeated in a consistent way by drivers, it may become habitual and committed without conscious thought or full realisation (Parker, West, Stradling, & Manstead, 1995).

There is reason to expect that the constructs of mindfulness and habit could influence the intention-behaviour relationship in speeding behaviour in school zones. That is, mindfulness may help individuals to fulfil their intentions by strengthening the ability for self-control (i.e., the ability to be attentive and aware of one’s surrounding environment). Habit has certain features, (i.e., automaticity) which may lead to a lack of control and mindlessness given that, as behaviour becomes habitual, it will be guided by environmental cues which, in turn, trigger the automatic response/s (Forward, 2009a). The familiarity of the environment may lead drivers to be on “auto-pilot” and be unaware of their surroundings. However, the nature of the role and interplay of habit and mindfulness within the TPB framework when attempting to explain speeding behaviour are not yet known. This present study will explore the TPB beliefs (behavioural, normative, and control) in addition to individuals’ thoughts and responses regarding the constructs of mindfulness and habit in the attempt to better understand drivers’ speeding behaviour in school zones.

2.2 Elicitation study

The salient beliefs (i.e., behavioural, normative and control beliefs) must be elicited from the respondents themselves, or in pilot work from a sample of respondents that is representative of the research population. Ajzen and Fishbein (1980) suggested conducting a belief elicitation study with all new target behaviours and new populations of interest. Although there has been considerable TPB-based research in the area of drivers’ speeding behaviour (e.g., Elliott, Armitage, & Baughan, 2007; Forward, 2009b), much less evidence is available regarding the factors influencing drivers’ speeding in school zones. Thus, in such a ‘new’ context of speeding behaviour, Ajzen (access date 12 May 2012) recommends the use of open-ended questions to elicit salient beliefs and which may be used to guide interviews and/or focus groups (Ajzen, access date 12 May 2012).

This qualitative, open-ended questioning approach will provide valuable information about the target behaviour. In the TPB, beliefs play a central role in providing the cognitive and affective basis for attitude, subjective norms and perceived behavioural control (Ajzen, 2006). By measuring beliefs, the researcher will gain insight into the underlying thoughts and perceptions in relation to the target behaviour. For example, in speeding behaviour research, guided by the TPB, the researcher can explore the reasons why people hold certain attitudes, subjective norms and perceived behavioural control towards speeding. This information will ultimately provide a comprehensive understanding about speeding intentions and behaviour in relation to speeding in school zones.

The current study, an elicitation study of salient beliefs, incorporates open-ended questions explored within focus group discussions. Focus group discussions not only provide insight into the source of complex behaviours and motivations, but also an effective and efficient means of gathering a large amount of information from several people simultaneously (Asbury, 1995; Gibbs, 1997; Kitzinger, 1995). Further, in comparison with alternative approaches, such as individual interviews, the interaction between participants in group discussions offers the benefit of having participants put questions to each other and re-evaluate and reconsider their own understandings of their specific experience (Morgan, 1996).

The current study sought to elicit the salient behavioural, normative, and control beliefs underpinning speeding behaviour in school zones with the inclusion of the additional constructs of mindfulness and habit.

3.0 Method

3.1 Participants

A total of seventeen (17) Australian drivers participated in this study in one of four group discussions. The final sample included five males and twelve females aged between 17-56 years (mean age = 28.18 years), who were recruited via convenience sampling from 1st year psychology students at a large South East Queensland University. The participants' driving experience ranged from one to forty years, with ten of the participants reporting that they travelled more than 150 kilometres in an average week.

3.2 Interview schedule

A brief demographic questionnaire was devised, which asked participants to report their gender, age, travel mileage per week, and years of driving experience. A semi-structured interview schedule, in accordance with Ajzen (2006) and others (e.g., Francis et al., 2004) was devised to guide the group discussions. The following questions sought to elicit the participants' beliefs about speeding in school zones. As the schedule shows, as well as the questions about beliefs, there were also questions included to permit investigation of the additional constructs of interest, which are mindfulness and habit.

Table 1. Semi-structured questions used to guide the focus group discussions.

Behavioural beliefs	<ul style="list-style-type: none"> • What do you think would be the advantages/disadvantages of speeding in school zones? • Are there any other possible things or aspects that may influence your speed choice in school zones?
Normative beliefs	<ul style="list-style-type: none"> • Would the people important to you approve of your speeding behaviour in school zones? Who would approve/disapprove? • When you think about speeding in school zones, are there any other individuals or groups who come to mind who may influence your speed choice in school zones?
Control beliefs	<ul style="list-style-type: none"> • What factors may encourage/discourage your speed in school zones? • What will stop you from speeding in school zones? • What other things are there that may not have been discussed as influencing factors that could make you speed if you do not usually speed, particularly in school zones?
Habit	<ul style="list-style-type: none"> • Do you feel weird if you speed in school zones? • Have you frequently complied with the 40km/hr speed limit when arriving in the school zones in the past?

	<ul style="list-style-type: none"> • Is it your routine when you arrive at school zones to reduce your speed without looking at time of the day?
Mindfulness	<ul style="list-style-type: none"> • Think about driving through a familiar route every day: have you ever felt like the car drives you to the destination? • When you typically drive, do you think you are driving on 'auto-pilot' much of the time? • What factors would influence you to stay focused on what's happening in the present during driving? • Do you think that your mood will affect your driving (i.e., being a mindless driver)? • When you are in auto-pilot, have you tended to notice school zones and the change in speed limit?
Intention	<ul style="list-style-type: none"> ○ In the future, do you think that you will comply with the speed limit in school zones?

3.3 Procedure

The study was advertised to 1st year psychology students via the electronic noticeboards of relevant units. The focus groups consisted of four to five participants in mixed groups of males and females of all ages, and each discussion took approximately one hour during which time, refreshments were provided.

On arrival at the discussion, each participant was given an information sheet. Participants were asked to provide their consent to participate, verbally. Before the discussion commenced, participants were asked to complete the brief demographic survey. Trained research assistants facilitated the discussion and were guided by the semi-structured interview schedule. From the outset of the discussion, the researcher emphasised that every individual's thoughts were appreciated and valued and differences of opinion were encouraged. Thus, throughout the focus group discussions, the facilitator continually invited participants to share their thoughts. The discussions were audio recorded and transcribed verbatim by a professional transcriber. The transcriber removed any identifying details (e.g., individuals' names) so that the final transcriptions were anonymous. To thank participants for their time, they were granted partial course credit.

3.4 Data analysis

The data were analysed via thematic analysis. Thematic analysis is a qualitative analytic technique to identify, analyse and report patterns (i.e., themes) within data (Braun & Clarke, 2006). The transcripts were coded initially by grouping responses about speeding in school zones according to each of the relevant beliefs (i.e., behavioural, normative, and control) as well as in relation to individuals' comments about the role of both habit and mindfulness. The findings are presented in accordance with each of these beliefs/constructs with supporting data (quotes) provided. To protect participant confidentiality, each quote is presented only in relation to whether the comment was made by a female or male respondent, the order in which the participant had first spoken in the discussion, and the group number (assigned on the basis of the order in which the groups were conducted). Thus, a female who was the second female to speak within the third group discussion would be identified as *F2, G3*.

4.0 Findings and discussion

4.1 Behavioural beliefs: Advantages and disadvantages of speeding in school zones

The present study found that there was agreement across the groups that speeding in school zones was dangerous and an unacceptable behaviour. There was also agreement by all participants that there are no real advantages to speeding in school zones. The frequently acknowledged outcomes, and most extreme disadvantage of speeding in school zones, were endangering the life of school children and, to a lesser extent, being fined for speeding.

4.2 Normative beliefs: The important people (or groups of people) perceived as approving or disapproving of speeding in school zones

As could be expected (especially in light of the previous behavioural belief responses regarding the extent to which speeding in school zones was associated largely as a negative behaviour in terms of it having no real advantages and only disadvantages), the majority of participants believed significant others would not approve of the speeding in school zones and would expect the driver to comply with the speed limit in school zones:

“I think because I’ve been a bit outspoken with it to everyone in my family, I’d be getting called a monumental hypocrite if I did it myself.” (F1, G2).

Several participants also made reference to the non-verbal, silent inaction of significant others, when they knew the participant was speeding in school zones. However, this inaction was not to be taken to mean that the significant others were approving of an individual speeding in a school zone. For instance:

“Sometimes people can be shy though and not say anything. They don’t want to speak up. They would be annoyed and I wouldn’t like it [that the significant others angry because the driver was speeding in a school zone].” (F1, G1).

In addition to parents and family members, the wider community also were referred to as important sources of normative influence regarding drivers’ speed choice in school zones. For instance:

“When I see parents and teachers and families that I know I kind of go even slower to show them I’m doing the right thing because I’m a very familiar face in the community, so if I do something wrong that’s going to look pretty bad.” (F2, G3).

4.3 Control beliefs: The barriers preventing and factors encouraging speeding in school zones

Participants identified several factors as encouraging an individual driver to speed in school zones including: time pressure (the more time pressured, the more likely one is to speed in a school zone); driving in an unfamiliar area or environment (i.e., where one may not be aware of a school zone, they may exceed the limit); in the case of an emergency; when school children are not visible/present in the school zone; and due to the location of a school (i.e., beside a main road and therefore the driver more likely to speed). Some participants also reported that they thought some drivers just prefer to speed so that they may do so irrespective of whether or not those particular drivers are in a school zone.

In terms of factors that would discourage speeding in school zones, participants readily and quickly identified several factors including: reports of crashes or advertising (depicting crashes); speed cameras; engineering measures, such as speed humps and speed indication monitors; the presence of police or authority within/near a school zone; and the traffic volume in a school zone (i.e., such that the greater the volume, the more congestion, the less speed).

4.4 Speeding vs compliance in school zones

The TPB hypothesises that behaviour is likely to be performed if the outcomes are believed to be positive (Ajzen, 1991). Thus, in relation to speeding behaviour, previous studies have found that drivers who commit speeding violation believed that negative outcomes, such as a crash with a pedestrian and/or another vehicle was unlikely (Forward, 2006). Furthermore, the behaviour may in some respects be positively valued by some drivers to the extent that it is seen as advantageous to speed because, for instance, individuals may perceive that speeding will get a driver to their destination quicker and will align their speed with those of other vehicles (Forward, 2009a; Warner & Aberg, 2008).

However, highlighting that speeding in school zones appears to be a very specific and unique context of speeding research, the present study found that drivers reported that the consequences of such behaviour are mostly negative (i.e., more likely to be involved in crashes with school children) rather than positive (i.e., enjoyable or exciting). The participants expressed concern about school children who could run or jump out into street without knowing the risk associated with their behaviour. In relation to normative beliefs, once again the negative pervasiveness of speeding in school zones was highlighted in the current findings in that drivers found it difficult to identify any significant others who would approve of the behaviour while they were able to readily and quickly identify various significant others who would disapprove. The normative findings are unsurprising given the strong safety concerns that are held among parents and the community more broadly in relation to the safety of school children.

In relation to the control beliefs, various beliefs were identified as either encouraging or discouraging the behaviour. In particular, in most cases, factors that were considered as encouraging speeding were in situations where a driver may have been off guard and therefore had sped unintentionally. This tendency would be more likely in situations where there were no school children present in the school zone (i.e., no visual reminder that a driver was in a school zone). That said, however, participants also expressed likely feelings of guilt if they were to speed (or had sped) unintentionally in school zones. Unlike other speeding behaviour research, when discussing speeding in school zones, as has been noted herein previously, the majority of participants claimed they rarely ever sped in school zones and regarded it as an illegal behaviour but, referred to seeing other drivers speeding in school zones. Participants believed that those drivers who were speeding in school zones may have been doing so unintentionally. In other words, participants believed that speeding in school zones would most likely only occur when the driver was speeding unintentionally because drivers were unlikely to ever set out to intentionally speed in school zones.

As the discussions continued, it became more apparent the focus of exploration needed to be more about individuals' intentions to comply with the speed limit in school zones as opposed to speeding in school zones (Richetin, Conner, & Perugini, 2011). Thus, given the reported largely unintentional nature of speeding in school zones, there is reason to expect that the constructs of mindfulness and habit could exert particularly important influences on speeding and compliance with speed limit in school zones. Specifically, less mindful individuals are more likely to behave automatically, which would detract from them following through on their intentions (to not speed and therefore result in them speeding). This tendency may share some conceptual overlap with the construct of habit. Habit is a type of

automatic behaviour that is goal dependent, and the familiarisation of the environment may lead drivers to be on “auto-pilot” and be unaware of the surroundings (De Bruijn et al., 2007). Empirical evidence reviewed earlier suggests that performance of social behaviour is not always preceded by intention. Habitual, less-mindful processes may also influence performance of social behaviour and the intention-behaviour relationship. Thus, the next section explores participants’ responses regarding mindfulness and habit.

4.5 Additional constructs of interest: Habit and mindfulness

Given the apparent importance of mindfulness in relation to comply with the speed limit in school zones, further probing of the reasons influencing mindless speeding behaviour in school zones, was conducted. The findings suggested that mindless driving may be more likely to occur in certain conditions including; driving on an unfamiliar area/route, having time pressures, change of habit (i.e., driving an unfamiliar or different route from one’s regular driving), fatigue or boredom, being “lost in thought”, long distance travel, and driving while in a bad mood. Such factors could contribute to a lack of attention as well as a reduced awareness of one’s current situation and, ultimately, a driver’s failure to notice that they are driving in a school zone:

“I’ve noticed too at the moment where we live there’s a road closed because they’re doing road works so the detour is actually going through the school zone and there’s a lot of people sort of speeding through there because it’s maybe not a route that they normally take.” (F1, G2).

As the discussions continued, the link between mindfulness and habit also became clearer. A few participants said that routine driving could facilitate their development of positive driving habits (i.e., compliance with the speed limit of 40km/h in school zones), but, they also highlighted the possibility that routine driving could also lead to mindless driving behaviour:

“It sort of happens, if you do a reasonable trip to work, it sort of happen [driving mindlessly] in every trip. It mightn’t be that you don’t remember any of the trip but if you’re going through fifty sets of traffic lights you’re not consciously thinking is that light red, is that light green, you’re just letting it happen subconsciously. And I know there’s a few altercations [odd occasions] that I have driven through lights with someone else in the car and they’ve said that was red.” (M3, G4).

The participants continued to discuss the issues of mindless driving. Some participants said that when they became mindful that they were in school zones (after an initial period of being on auto-pilot), they regretted having engaged in the behaviour and that their response had typically been to reduce their vehicle speed. However, a few participants also suggested that although they would reduce their speed limit, they may not reduce their speed to the extent that they would be complying with the 40km/hr speed limit:

“Yeah I guess....that you feel awfully sorry but you don’t necessarily brake, so you ..instead of going from sixty to forty you go sixty to forty five.” (M1, G3).

Further discussion on the issues associated with slowing down rather than complying, revealed that the school zones sign and the length of school zones could affect drivers’ decisions as to whether they would comply with the speed limit or just slow down from their initial driving speed:

“I’ve also seen a lot where the school sign comes by after you’ve already driven past the school in some cases. You’ve passed the school anyway. Like the one near my house,

there's an intersection and the school is on the corner. The sign is halfway apart from the school. So by the time you slow down, it's the end of the school zone.” (F2, G2).

Arguably, the important aspect to be derived from such findings is that drivers' intentions are to slow down, as soon as they realise that they are driving within a school zone. Other factors relating to the surrounding context do influence whether the driver slows down to the extent that they are complying with the posted speed limit of 40km/hr.

5.0 Summary and conclusions

The present study reveals some interesting findings which could have theoretical and practical implications. The use of focus group discussions allowed the participants to interact and discuss actively, re-evaluate and reconsider their responses and understanding on the topic. For instance, compared with speeding behaviour more generally (and not in school zones) which individuals may readily cite some advantages as being associated with the behaviour and some important others approving of the behaviour (e.g., Horvath, Lewis, & Watson, 2012), speeding in school zones appears to be a much more negatively valued aspect of drivers' speeding behaviour. Thus, to potentially avoid negative perceptions from other participants, participants may have felt less comfortable admitting that they had sped in school zones. This finding suggests that future research need to focus on complying rather than speeding. Speeding (and compliance) in school zones represents a specific context, for which few theoretically-based investigations of underpinning factors influencing the behaviour have been conducted previously. Therefore, this study provides a valuable contribution to current understanding of drivers speeding within a specific context (i.e., school zones).

In addition, given the specific context of this study (i.e., speeding in school zones) was regarded largely as a negative behaviour, the feeling of regret for committing a speeding offence in school zones is not surprising. However, the findings contrast with previous studies that show that drivers who speed or who are caught for speeding offences did not feel guilty about it and regard the offence as less serious (Corbett & Simon, 1992; Parker, Manstead, Stradling, & Reason, 1992b). One possible explanation of the discrepancy is that the attitude towards speeding are related to the setting or situation presented to the participants (i.e., highway, major road, residential area) (Forward, 2006).

Speeding more broadly may, in part, be associated with drivers' reporting an intention to speed (i.e., i.e., the driver has control over the behaviour and, therefore, should be able to translate intention to speed into reality as a behaviour (Fleiter, Lennon, & Watson, 2009b). However, the findings in relation to speeding and school zones suggest that speeding in such a context is more likely to be unintentional and largely due to driving mindlessly. This phenomenon (i.e., mindless driving behaviour) may be more likely to occur for various reasons as were mentioned before. Mindless driving behaviour may also occur when the behaviour has been performed several times in the past and thus becomes habitual and is committed by an individual without conscious thought or full realisation. As such, mindless drivers are more likely to behave automatically, which would detract from them following through on their intentions. It also enables an individual to perform actions or behaviour in a quite mindless way. The present study highlighted the possibility of link between habit and mindfulness to further explain intention and behaviour specifically in relation to speeding and compliance in school zones.

In term of the practical implications, the present study identified specific beliefs that made important contributions towards drivers' speeding. The most salient of these beliefs could be used to help design road safety interventions to persuade and encourage drivers to comply with speed limits in school zones. For instance, the possible intervention strategies include public education and mass media campaigns that emphasise the potential of negative

consequences of speeding in school zones. In relation to mindfulness, the countermeasures which heighten the extent to which drivers are mindful of when they are approaching and/or driving within a school zone should help to reduce unintentional speeding. For instance, school zones may require more advance notice, in terms of signage including active electronic signage and on-road treatment/markings before a school zone starts. Engineering measures, such as speed humps or transverse bar (yellow line) may also need to be considered in the future.

In conclusion, the findings of the present study provide insight into drivers' speeding and compliance in school zones in terms of salient behavioural, normative, and control beliefs. The findings also highlight the role and interplay of mindfulness and habit in relation to speeding in school zones. For some drivers, speeding in school zones may result from mindless driving. Although often unintentional, such behaviour functions to still potentially endanger the safety and lives of school children. Thus, a range of strategies to increase mindfulness seems to be appropriate for the purposes of promoting road safety in school zones.

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