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Identifying salient beliefs underlying speeding behaviour: An elicitation study of nigerian drivers

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ABSTRACT

Using the Theory of Planned behaviour, as a theoretical framework, the current study sought to identify the salient beliefs underpinning speeding behaviour among commercial drivers in Nigeria. A sample of 13 drivers participated in one of three focus group discussions. Deductive content analysis revealed that although speeding was perceived as an adverse behaviour with negative consequences (e.g. loss of life and properties) across all groups, participants still believed the behaviour was significant (e.g. journey time reduction) in their day-to-day life. The study also revealed that male peers were more likely to encourage speeding, while family members, employers, and enforcement agencies were the important others who will disapprove of it. For control beliefs, the findings revealed that situational and environmental factors such as; personal emergencies and good road networks facilitate engagement in the behaviour while poor weather and heavy traffic served as impediments. In conclusion, practical implications and strategies for the development of speed awareness interventions are discussed.

1. Introduction

There are an estimated 1.35 million road traffic deaths globally each year. In addition to these deaths, an estimated 50 million people are injured in road crashes annually. (WHO, 2018). Road traffic crashes are usually as a result of many interacting factors; however, the human factor is estimated to account for over 90% of all causes of traffic crashes (Pakgohar, 2007).

Speeding (speed limit violation and inappropriate speed) is considered the biggest contributor to road traffic crash occurrences and severity. Despite the enormous evidence of the relationship between speeding and crash risk and severity (Fildes and Lee, 1993; Aarts and Schagen, 2006), the behaviour continues to be prevalent among drivers across the world. Most traditional road safety educational interventions designed to change driver speeding behaviours have mostly been based on raising awareness and are usually hinged on intuition rather than being grounded in theoretical frameworks (Parker, 2002). According to Elliott and Armitage (2006), these interventions are not always able to translate the good intentions generated into action, as a result of their limited impacts on the behaviour. Therefore, there is a need to develop effective theory-driven interventions that target salient variables that are likely to influence driver behaviour.

2. Theoretical background and context of the current study

To develop effective speeding interventions, it is important to understand the mechanisms by which driver speeding behaviour is influenced. The theory of planned behaviour (TPB) (Ajzen, 1991) provides one of the most important accounts of behaviour in social behavioural research, and so potentially provides a framework for the development of countermeasures. The TPB model (Ajzen, 1991), posits that volitional behaviour is to a large extent, predicted by intention (summaries of people's motivation to engage in a behaviour), and that three sets of beliefs mediates behavioural intentions. These beliefs include: (i) behavioural beliefs, i.e. beliefs about the consequences of performing a behaviour, (ii) normative beliefs, i.e. beliefs about the views of significant others, and (iii) control beliefs, i.e. beliefs about the factors that facilitate or impede the performance of a behaviour) (Ajzen, 1991).

Previous research has highlighted the use of the TPB model in the development of countermeasures aimed at improving speeding behaviour (Parker et al., 1996; Stead et al., 2005; Elliot and Armitage,

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2009). For example, Parker et al. (1996), used series of persuasive videos to assess the effectiveness of an intervention grounded in the TPB model. Results indicated that the normative belief video (designed to convey to the participants the message that people do not like being driven by someone who exceeds the 30 mph (48 km/h) speed limit in residential zones) brought about statistically significant belief changes with respect to scores on TPB items and significant changes in general attitudes toward speeding. The effect of the control belief video (designed to persuade participants that the driver can control his or her own behaviour, despite pressures to speed from other motorist, and that it is therefore possible to keep to the speed limit) was in the opposite direction, i.e. participants who saw the video, reported that it would be difficult to keep to the speed limit in such a situation. The behavioural belief video (designed to show the presence of hazards in seemingly harmless roads and to show that by keeping to the 30 mph (48 km/h) speed limit, they will increase their chances of being able to deal with whatever hazards do arises) had no measurable effect on attitude or beliefs. The Scottish "Foolspeed" study by Stead et al. (2005), used a series of speed awareness media campaigns based on the concepts of the TPB model. Their results showed only the behavioural belief intervention had significant changes in the desired direction with no changes found for the normative and control beliefs intervention. According to Lewis et al. (2013), the relatively low performance of the above TPB-based interventions could be as a result of the interventions relying on only one message to target each of the TPB's three components and as such may have achieved different results.

According to Ajzen and Fishbein (1980); Ajzen (2006), behavioural interventions that seek to change beliefs that guide the performance of the behaviour, must first identify specific salient beliefs from sample respondents that are representative of the population of interest. Salient beliefs help in the prediction and understanding of attitudes and indicate what might be useful for interventions to change behaviour (Ferguson et al., 2009). These salient beliefs are those that first come to mind when participants are asked open-ended questions and are also referred to as accessible beliefs (Ajzen and Fishbein, 2000).

According Abdul et al. (2012), the more researchers understand these beliefs, the more likely effective interventions are developed. These beliefs can be elicited through a series of open-ended questions, with responses undergoing content analysis and then using the most frequently cited beliefs in the final intervention (Ajzen and Fishbein, 2000). The assumption is that if a belief is not mentioned, it is not salient, as only accessible beliefs in memory or those mentioned early are considered as salient (Ajzen and Fishbein, 1980). However, despite plenty of support for the TPB and the importance of salient beliefs in the model, there are arguments that the belief elicitation stage in TPB-based intervention has received relatively little attention from researchers (Sutton et al., 2003). Also, despite the demonstrated efficacy of the TPB in predicting drivers speeding behaviour and its use in the development of interventions, there has been limited research in low-and-middle-income countries particularly in Sub-Saharan Africa. Previous studies have mostly been done in high-income countries (HICs) with similar road-safety cultures and driving styles. According to Fishbein and Manfredo (1992), people's beliefs about behaviour will always vary and more importantly, from population to population, as beliefs cannot be assumed to be transferable among different populations. Thus, it will be valuable to identify the salient beliefs underlying speeding behaviour in a country like Nigeria giving the sheer quantity of road crashes and fatalities.

The current study was conducted as part of a larger study based on the TPB model that explored the use of the model in developing a speed-limit compliance intervention for commercial drivers in Nigeria (only findings relevant to the elicitation phase are discussed here, details of the larger study are discussed in a separate work). The choice of commercial drivers is based on their over-representation in road traffic crashes in Nigeria representing 58.9% of crashes (Federal Road Safety Corps, 2017).

3. Methods

3.1. Participants

Ethical approval was given by the University of Leeds Research Ethics Committee with reference: AREA 16–011, and written consent was obtained from the study participants. The sampling frame consisted of 13 male drivers randomly recruited from fleet companies in the city of Port Harcourt in River State, Nigeria and within the age range of 30–65 years. Inclusion criteria were: (i) Driving a work vehicle at least once a week, (ii) Ownership of a valid driver's licence, (iii) Report of over 5,000 km annual mileage.

3.2. Data collection

Semi-structured interview scheduled based on the instructions of Ajzen and Fishbein (1980), were designed to guide the three focus group discussions. Questions were aimed at exploring participants cognitive and affective behavioural beliefs, normative beliefs, and control beliefs towards speeding (excessive speed and speed limit compliance). Discussions were audio-recorded with participants permission and lasted between 55 and 60 min. To minimise bias, participants were assured of the confidentiality of their responses. The topic guide included the following prompts to elicit participants views and beliefs: (i) *Instrumental beliefs*; participants were asked questions about the advantages and disadvantages of speeding. (ii) *Affective beliefs*; participants were asked to list what they like/enjoy and dislike/hate about speeding. (iii) *Normative beliefs*; participants were asked which groups or people would approve or disapprove of their speeding behaviour (iv) *Control beliefs*; participants were asked what factors or circumstances will make it difficult or easy for them to engage in speeding. (V) *Intention*; participants were asked if they thought they will engage in speeding in the future. Discussions continued until theoretical saturation (i.e. a point were no new information or belief was being raised) was reached. At the end of the discussions, participants were thanked for their time and contribution and light refreshment offered.

3.3. Data analysis

Audio recordings were transcribed verbatim and coded using a data matrix by grouping participant's responses about speeding into each of the relevant beliefs in relation to the underlying TPB model. Most frequently beliefs were indexed and mapped based on the recurring beliefs. Each of these beliefs is discussed together with supporting statements in the form of quotes from participants. The data were analysed using Deductive Content Analysis (DCA), which is a systematic and objective means of describing phenomena (Krippendorff, 1980). It involves a structured matrix development whereby all data are reviewed for content and coded for correspondence to the identified categories. Table 1 shows elicited beliefs by participants within each of the TPB model constructs. Only salient modal beliefs (i.e. most commonly cited beliefs) are listed following Ajzen & Fishbein (1980) rule of including; ten or twelve most frequently mentioned beliefs (a practice that is likely to include at least some of the beliefs mentioned by each respondent in the sample), beliefs mentioned by at least 10–20% of the sample population and choosing as many beliefs as necessary to account for up to 75% percentage of all beliefs elicited.

4. Results

The results are presented according to the TPB model constructs. Verbatim quotes from the study participants are labelled to the order

Table 1
Salient accessible beliefs.

BEHAVIOURAL BELIEFS			
Positive Cognitive evaluation	Negative Cognitive evaluation	Positive Affective Evaluation	Negative Affective Evaluation
Reduced journey times Helps me reach my destination faster. Helps me in time of personal emergencies. Saves my life in times of security threats.	It causes accidents and fatalities. It causes damage to vehicles and properties. It uses more fuel, hence causing harm to the environment. Puts other road users at risk It makes it hard for me to quickly stop my vehicles when there is an obstacle on the road.	It thrills me (it is fun and exciting) It helps keeps me awake and alert. It helps me arrive on time	It pricks my conscience It makes me nervous Being scared of crashing
NORMATIVE BELIEFS			
Approval	**Disapproval**		
Male friends and peers	Family members/Children Employer Road safety authority		
CONTROL BELIEFS			
Impediments	**Facilitates**		
Driving in heavy traffic Driving in poor weather When driving with passengers who want me to drive slowly Driving inbuilt areas Driving in curvy roads Presence of police or road safety officers Presence of speed bumps	Driving on good roads Driving in low traffic Being late or in a hurry Having personal emergencies When driving a "sound" vehicle When driving on a wide and straights road		
INTENTION			
If there is a need or a reason, I would exceed If there is an emergency I will speed will speed unintentionally if excited When I don't know the speed limit I will speed.			

in which the participant had first spoken in the discussions and the group number. For example, the third participant to speak in the second focus group would be identified as (P3, 2). Table 1 presents the most frequently mentioned beliefs by participants within each of the TPB model belief categories. Beliefs mentioned by only one or two participants are not reported.

4.1. Behavioural beliefs

Participants across all groups were aware of, and broadly endorsed that there were consequences of speeding. In terms of the positive cognitive outcome of speeding, four beliefs emerged. Getting to a destination faster and reduced journey time was the most cited:

"The advantage of speeding is that, when you speed up, you save some time, you get to where you are going on time" (P2, 3)

Other perceived cognitive advantages of speeding were in times of personal emergencies and security threats:

"I would speed if a family member (e.g.my kid) has a medical emergency" (P5, 3)

"I sometimes speed on routes that I think are not safe. E.g. I tend to speed along the East-West road due to the number of arm robberies on that route" (P3, 1)

Five negative cognitive outcomes were elicited; however, cause of crashes and fatalities was the most elicited belief:

"Speeding is a major cause of ghastly car accidents and deaths. Your life, the passengers life's and the life of other motorist are greatly in danger when speeding" (P3,2)

"*The expenses are higher on high speed; Human life is at stake, the tear and wear of the car are higher, you even use more fuel when you speed. In short, the more the speed the faster the aging of the car*" (P1, 1)

Participants in the current study elicited a range of perceived positive affective outcomes of speeding:

"*In addition to testing the strength of my car, there is fun in speeding, it is more of a challenge when you are driving, and someone drives past you. You pick up the challenge of passing this person, or my car is better than his car. If I drive slowly on long-distance journeys, I tend to fall asleep. Am usually more alert when am driving fast"* (P4, 3)

Specific negative affective outcomes of speeding were not mentioned spontaneously (i.e. without prompting) by any of the study participants. However, on prompting the following were cited:

"*Whenever I am speeding, particularly when I have my family with me, there is always that fear of a crash happening. Sometimes thoughts of not seeing my family again come to my mind"* (P4, 2).

"Speeding naturally makes me nervous or scared. That is why I rarely speed except there is great need" (P4, 1)

4.2. Normative beliefs

Across all focus groups, male friends and peers were cited as the most significant others who approve of their speeding.

" I have a male cousin who by default always speeds. When you drive with him and some of my friends and you are not speeding, the next thing is they ask you to pull over for them to take over the driving" (P2, 3)

"Most of my friends do not see driving at 110–120 km/h as speeding. Speeding to them is when you begin to hit 130 km/h and above" (P1, 2)

When participants were asked to nominate persons who they thought will disapprove of their speeding, across all focus groups, the most frequent response include family member; particularly wife's and elder relations.

"When I drive with my elder brother it is always boring as he wants me to drive a maximum 70–80 km. It gets me sick sometimes" (P1, 3)

"Sometimes my passengers do not approve of my speeding; for Example, my wife and family members tend to stop me from speeding by telling me to slow down" (P2, 3)

Other identified important others who disapprove of speeding include; employers and road safety officers.

"speeding is a no-no in my job. You will be penalized if your records show you have driven above the speed limit over a given time" (P4, 2)

Other sources of social influence that were mentioned were often along the vague lines and such do not represent salient social pressure consistent with normative beliefs.

4.3. Control beliefs

The participants in the study cited several perceived facilitators to speeding behaviour. Driving on good road networks was the most frequently mentioned facilitator of speeding.

"When the road is good and there is less traffic I sometimes speed more" (P3, 2)

Other beliefs elicited that facilitate speeding include; driving in low traffic, driving on straight and wide roads, being in a hurry or being late, and driving when faced with personal emergencies.

"At night when the traffic is all gone, it becomes much easier to speed. Sometimes it is a complete contrast of daytime driving" (P2, 1)

Driving in congested roads and poor weather was the most elicited impediment to speeding.

"It is hard to speed when there is congestion or in-built areas" (P4, 3)

"*Speeding when it rains can be dangerous. One is most times required to slow down when the road becomes slippery or when you can see clearly in the rains"* (P2, 2)

4.4. Intention

Participant's motivation to speed was elicited by directly asking respondents if they intended to perform the behaviour in the future. Most of the participants expressed their intention to comply with the speed limits. However, some participants gave instances where they will speed ranging from personal emergencies to unintentional speeding.

"I might be compelled to speed by circumstances. Even though I don't want to, or even don't like it, but I could be compelled if there is a need for me to get out of a place fast, I will move fast" (P4, 1)

"The truth is that in Nigeria the absence of road signs creates a lot of confusion among drivers. Because if you are travelling on a road that is well signalised with the speed limit, any time I see the speed limit it enters my consciousness and it guides me. But since we have too many potholes on our road, the slightest chance of good road, I will speed to make up for lost time" (P1, 3)

5. Discussion

Reduced journey time and fast arrival at destinations were the most elicited advantages of speeding in this study. This finding has also been identified by previous studies (e.g. Lewis et al., 2013; Ferguson et al., 2009), and thus suggest the need for speed limits compliance interventions in Nigeria to raise drivers' awareness of the misperception of time saved from speeding. According to Regan et al. (2007), interventions should send a message that speed does not represent a means to save or make up time and highlight the need for better time planning strategies by drivers.

Other major advantages of speeding identified were the perceived excitement and fun and the perceived increase in alertness. The finding reflects the perception that speeding increases enjoyment and removes boredom when driving. The perceived benefit from speeding in terms of fun and supposed heightened situation awareness has been identified by previous studies (Abdul et al., 2012; Horvath et al., 2012; Lewis et al., 2013). Thus, speeding interventions that aim to modify such beliefs should emphasise on the thrill-seeking personalities of driver's and how this influences their driving. Beliefs that speeding is fun and enjoyable may be addressed with counter examples in which risk-taking leads to negative consequences such as unattractive damage to cars and likely loss of life, and disapproval from family (Rowe et al., 2016). Also, interventions could highlight compliance with speed limit put driver's in more control and makes them more attentive and mindful of the driving situation (Abdul et al., 2012; Lewis et al., 2013).

Participants in the current study reported speeding as a positive outcome in times of personal emergencies and security threats. The above finding may suggest that some of the identified beliefs are motivated by circumstances rather than underlying beliefs and values. The probable strategy for behavioural change of such perceptions would be through enforcements. However, with limited or no enforcement of speed limits violations in Nigeria, there may be limited options for designing speeding interventions for such beliefs. However, even though it is beyond the scope of this study to review evidence relating to strategies for reducing speeding when faced with life-threatening personal emergencies (e.g. when family members need medical help or when attacked or tailgated by criminals). It is important to note that there is poor delivery of emergency services in most low-income countries like Nigeria, leaving individuals to drive themselves to hospitals in emergencies. Also due to poor security situations in most of these countries, some routes are bedevilled with miscreants. However, a pertinent issue to note is for interventions to recognize and challenge the perception that driving above the speed limit under such conditions of heightened emotions saves time. Emphasis should be made on the increased risk of having a collision which would eliminate the benefits. Also, interventions can stress the overestimation of time saved from speeding.

It is notable that the risk of crash and loss of life was the most elicited disadvantage of speeding by participants in this study. Thus, it may be relevant for anti-speeding interventions to depict the trauma a driver causes to other people when life is lost in a crash and the monetary cost to themselves. Also, giving the strong perception of damage to the vehicle and properties as an undesirable outcome of speeding by participants in this study, speeding interventions can also show the consequences of losing one's vehicle or damaging another person's vehicle or properties through the stress of missing a bus or taxi (loss of freedom/control over ones travel decisions) or having to pay high insurance, and in Nigeria where car insurance is not very common, having to pay for the repair or purchase of another person's car and your car as well.

In relation to normative beliefs, study participants identified male peers and friends were more likely to support and encourage speeding while family members and employers were less likely to encourage speeding. This finding is comparable to previous studies by Horvath et al. (2012); Elliott et al. (2005). Speeding intervention could highlight family members or close ones who have died or got injured as a result of speeding (Lewis et al., 2013). Interventions could highlight the fear and consequences of losing one's job due to speed limit violations.

The exploration of control beliefs arising from the findings revealed, good road network and night-time driving as the most elicited factors that ease speeding. These findings suggest that participants in the current study hold the perception that they are in control of their speeding behaviour when the conditions seem safe. This finding is broadly consistent with previous studies (Ferguson et al., 2009). According to Lewis et al. (2013), "*such (mis)perception could be challenged by a message that illustrates how things can go wrong, even when conditions are seemingly safe*". This will involve interventions highlighting the unpredictability of some circumstances, and the need for drivers to give themselves the best chance to remain in control by not speeding. The use of in-vehicle speed monitoring devices such as intelligent speed adaptation devices (ISA) may serve as a potential strategy for increasing drivers' control of the behaviour, especially in conditions that appear relatively safe to them.

The most frequently elicited barrier to speeding by participants in the current study include driving in congested roads and poor weather. Again, it can be argued that such a perception is motivated by circumstances rather than underlying beliefs and values. Therefore, an intervention can emphasise on drivers' perceptions of personal control over their ability to drive within posted limits or driving within prevailing conditions.

Participants comments on future intention to speed reflects the effect of circumstances and situations on a driver's perception of speeding. Even though the participants in the study have all cited the negative consequence of speeding, they still believe certain circumstances allow for speeding.

The novel findings from the current study are the underlying belief that speeding is a lifeline in times of personal emergencies and security threats, and that the availability of a good road network is a facilitator for the behaviour. These findings show that people's beliefs are sometimes influenced by many factors and can either be personal or envi-

ronmental (Curtis et al., 2010). Speeding behaviour may appear to be similar among the different populations, however, some underlying beliefs and perceptions towards the behaviour are usually different and appear to be affected by the target population and location. This can be seen in findings from this study revealing some evident differences in beliefs with past studies. For example, the believe that speeding helped participants in times of personal emergencies or security threats ("*In my understanding, the advantages of speeding depend on the environment you find yourself. If you are on emergency* e.g. *a medical emergency or if you driving on a dangerous road you have to speed for security purpose to avoid being attacked by bandits or thieves*" (P2, 2), or they speed mostly when the road infrastructures are good *("When the road is good and there is less traffic I sometimes speed more"* (P3, 2).

Nigeria like most developing nations is struggling with lack of basic infrastructures in terms of health care delivery, security and road networks. These circumstances over the years seem to influence drivers driving behaviour and in this context their choice of speed. For example, drivers are sometimes forced to drive above the legal speed limit on supposed "dangerous roads". These are roads that are either hotspot for arm robbery or banditry, and roads with large number of potholes. Driving on such roads creates opportunities where drivers tend to exceed the speed limit in other to escape being robbed or make up for lost times (slowing down to navigate potholes). Such findings will suggest the influence situational and locational factors in the formation of salient behavioural and control beliefs among participants in the current study.

6. Conclusions

This paper explored the underlying salient beliefs towards speeding behaviour among commercial drivers in Nigeria that could be used as targets in speeding interventions. Using the TPB (Ajzen, 1991) as a framework, focus group discussions provided an opportunity for participants to actively exchange anecdotes and experiences relating to speeding and speed limit compliance in a real-world decision-making context.

Overall, a total of 15 salient Behavioural beliefs, 4 salient Normative beliefs, and 13 salient Control beliefs were elicited from the study (Table 1 provides a summary of the study key findings). Also, some strategies to guide the development of message contents of speeding interventions have been suggested.

While the current study has revealed drivers' underlying beliefs towards speeding, their true attitudes and behaviour can only be assessed through a follow-up measurement phase based on the TPB. The insights offered by this study are potentially relevant in the application of the TPB in influencing change in drivers' speeding behaviour. The strategies provided in the study may serve as a key aspect in speed awareness campaigns targeted at this group of drivers and may play a critical part in modifying their choice of speed and ultimately reduce the road traffic crashes and resultant fatalities.

Although further research may be needed to develop effective speeding/speed limit compliance interventions, practical suggestions to guide the developments of such countermeasures have been offered to challenge those salient beliefs in this study.

The present study is subject to some limitations, as it could be argued that the use of a small convenience sample as suggested by Ajzen and Fishbein (1980) for identifying beliefs may not have been representative of the population. However, it should be noted that following the third focus group discussions no new beliefs were mentioned by participants indicating points of theoretical saturation (Curtis et al., 2010). It can also be argued the data collection procedure was from a real-world sample of the target population.

CRediT authorship contribution statement

Anderson Etika: Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Project administration, Writing - original draft. **Natasha Merat:** Funding acquisition, Methodology. **Oliver Carsten:** Conceptualization, Funding acquisition, Methodology.

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