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Comparing car drivers' and motorcyclists' opinions about junction crashes

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ABSTRACT

Motorcyclists are involved in a disproportionate number of crashes given the distance they travel, with a high proportion of these crashes occurring at junctions. Despite car drivers being solely responsible for many road crashes involving a motorcycle, previous research has mostly focussed on understanding motorcyclists' attitudes towards their own safety.

We compared car drivers' (n = 102) and motorcyclists' (n = 579) opinions about junction crashes using a web-based questionnaire. Motorcyclists and car drivers were recruited in similar ways so that responses could be directly compared, accessing respondents through driver/rider forums and on social media. Car drivers' and motorcyclists' opinions were compared in relation to who they believe to be blameworthy in situations which varied in specificity, ranging from what road user they believe is most likely to cause a motorcyclist to have a road crash, to what road user is at fault in four specific scenarios involving a car and motorcycle at a junction. Two of these scenarios represented typical 'Right of way' (ROW) crashes with a motorcycle approaching from the left and right, and two scenarios involved a motorcycle overtaking another vehicle at the junction, known as 'Motorcycle Manoeuvrability Accidents' (MMA). Qualitative responses were analysed using LIWC software to detect objective differences in car drivers' and motorcyclists' language.

Car drivers' and motorcyclists' opinions about the blameworthiness of accidents changed depending on how specific the situation was that was being presented. When respondents were asked about the cause of motorcycle crashes in a general abstract sense, car drivers' and motorcyclists' responses significantly differed, with motorcyclists more likely to blame car drivers, demonstrating an in-group bias. However, this in-group favouritism was reduced when asked about specific scenarios, especially in MMA situations which involve motorcyclists manoeuvring their motorcycles around cars at a junction. In the four specific scenarios, car drivers were more likely to blame the car driver, and motorcyclists were more likely to blame the motorcyclist. In the typical ROW scenarios, the responses given by both road users, as analysed by the LIWC, show that the law is taken into account, as well as a large emphasis on the lack of observation given around junctions, especially from car drivers. It is concluded that the perception of blameworthiness in crashes is very much dependent on the details of the crash, with a more specific situation eliciting a fairer evaluation by both car drivers and motorcyclists.

1. Introduction

Research into road safety has increasingly focused on road users' attitudes, opinions, values and beliefs which are important in understanding how they perceive and accept different levels of risk on the road (O'Connell, 2002; Musselwhite et al., 2010). Despite this, there has been little research investigating road users' opinions towards common hazardous road situations, which could provide an important insight into why crashes occur. In the current paper, we are particularly interested in the opinions different types of road users (car drivers and motorcyclists) have towards the same road situations.

Motorcyclists represent a specific and important issue for road safety, as motorcyclists are involved in a remarkably high number of road crashes given the distance they travel (e.g. DfT, 2015a). Moreover, when they are involved in these crashes they are more likely than car drivers to be injured and killed in the crashes, with motorcyclists being typically referred to as one category of vulnerable road users (Shinar, 2012). The combined effect of frequency and severity is shown in crash statistics that reveal that in the U.K. motorcyclists in 2014 were involved in 122.3 fatalities per billion miles travelled compared with 1.8 fatalities per billion miles for car drivers (DfT, 2015a).

In the U.K., the most common motorcycle crash occurs at junctions, typically with another road user violating an oncoming motorcyclist's 'right of way' (ROW), by pulling out of a side junction onto a main carriageway (Clarke et al., 2007). In many of these instances it is a car that is pulling out into the junction. Afterwards the car driver often

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reports being careful and attentive with their visual checks but nonetheless having failed to see the approaching motorcycle. This is commonly termed the 'Look But Fail To See' error (Brown, 2002), and motorcycle riders have their own term for such events – 'SMIDSY' ("Sorry Mate I Didn't See You"). Although it is possible that the driver in these cases has failed to see an oncoming motorcyclist, it is also possible that they are sometimes deliberately claiming a failure in visual attention when another factor may be responsible for the crash. One possibility is that the car driver does not want to admit to a deliberate driving violation, such as accepting a risky gap between traffic. For this reason, research efforts have focussed on understanding motorcycle crashes at junctions by investigating both car drivers' gap acceptance behaviour around motorcycles (Keskinen et al., 1998; Mitsopoulos-Rubens and Lenné, 2012) and car drivers' visual attention towards motorcycles (Crundall et al., 2008a, 2012; Lee et al., 2015).

A framework used to understand car-motorcycle interactions was developed by Crundall et al. (2008b). This framework suggests that a top-down influence of car drivers' attitudes will determine how they will behave in a given situation. Road users' attitudes can include attitudes that concern themselves, other road users, or the environment. These attitudes can therefore guide car drivers' actions during car-motorcycle interactions on the road, and are thought to subsequently influence measurable cognitive strategies such as drivers' visual attention allocation. It must be noted that attitudes, opinions and values all have an interconnectedness, and are all powerfully shaped by our past history, group memberships, and by our context-dependent experience of the given moment (Bergman, 1998).

The majority of research focusing on attitudes has been used as an attempt to understand human behaviour (Ajzen and Fishbein, 1975) by investigating whether a person responds favourably or unfavourably to a given object. However, attitudes can be very variable and dependent on many aspects such as whether the object of thought is specific or intangible (Augoustinos and Walker, 1995). Attitudes have also been found to be very susceptible to the influence of context effects (Turner, 1985).

One of the classic biases found in human attitudes is that of in-group bias. More than 40 years of research has shown that people favour members of their own group in their opinions, attitudes, and behaviours (Ratner et al., 2014). In a road safety context, it may be that car drivers have more negative attitudes towards an outgroup, in this case motorcyclists, compared to their in-group, which would be fellow car drivers. A common example of this might be 'motorcyclists are risk takers' which is a misconception which many car drivers hold (Crundall et al., 2008b). Although such an attitude might be widely held among car drivers, motorcyclists are likely to have a much more finely nuanced understanding of their behaviour in risky situations. Of course, it is possible that if car drivers thought more specifically about the contexts in which motorcyclists accept risk, they might modify their attitudes. In many areas of social psychology, social judgements have been deemed to be context-dependent as they depend on the frame of reference in which they are made (Haslam et al., 1992), with in-group bias also being shown to be dependent on the context (Jost and Major, 2001).

Despite car drivers being solely at fault in many motorcycle accidents (ACEM, 2009), many previous studies have focussed on understanding motorcyclists' attitudes towards their own safety (Clarke et al., 2004; Musselwhite et al., 2012). Wong et al. (2010) conducted a large motorcycle study with 623 motorcyclists, with the aim to understand why young motorcyclists may be involved in a high number of collisions. They concluded that there were three important personality characteristics in young motorcyclists which were sensation seeking, amiability and impatience. The amiable riders were relatively mature and safe riders, whereas the sensation-seeking riders were more comfortable with unsafe riding, and interested in the utility gained from it.

Conversely, a research study by Crundall et al. (2008c) looked to identify potential gaps in car drivers' schemata in relation to motorcyclists that may account for their increased probability of being involved in a crash with a motorcycle. Drivers filled in a questionnaire which comprised of 26 general and motorcycle-related items and the 24 items of the reduced Driver Behaviour Questionnaire (Parker et al., 1995). It was found that when car drivers were compared to a dual driver group (drivers who also hold a motorcycle licence), they showed more negative attitudes towards motorcyclists and also self-reported more driving violations. This study is unusual in directly comparing car drivers' and motorcyclists' attitudes, although the motorcyclists in this study were also car drivers. The majority of comparison studies have focussed on comparing the two road users' behavioural responses in simulation tests (Horswill and Helman, 2003; Shahar et al., 2011) and natural on-road driving/riding (Walker et al. (2011).

Shahar et al. (2011) is the only study to have compared car drivers' and motorcyclists' opinions towards general hazardous situations as well as comparing them in a behavioural simulation task. Car drivers and motorcyclists were compared on the degree to which 9 vignettes of various hazardous road situations were reported to be realistic and dangerous. Half of the car drivers and half of the motorcyclists were told to imagine they were driving a car through the scenario and the other half were told to imagine they were riding a motorcycle. It was found that while the participants who were told to imagine riding a motorcycle rated the vignettes to be more realistic, the real-life motorcycle riders rated the scenarios more dangerous, suggesting that their specific motorcycle experience influenced their criterion for danger. Although this was one of the first studies to compare drivers' and motorcyclists' opinions, only one of the vignettes was specifically concerned with car-motorcycle junction crashes. In addition, in some instances, participants may have been asked to imagine situations which were very unrealistic, for example, asking a car driver to imagine riding a motorcycle. If the car driver had never ridden a motorcycle before, their opinions in this condition may not be useful as the participant has no previous relevant information to draw from. A previous meta-analysis has revealed that attitudes predict behaviour better when they rely on information relevant to a behavioural decision (Glasman and Albarracín, 2006).

The use of an online questionnaire which includes both quantitative and qualitative aspects can be beneficial in providing in-depth information on road users' opinions which may guide these behaviours. Therefore, the current study's main purpose was to compare the opinions of car drivers and motorcyclists towards crashes at junctions, in particular, crashes that specifically occur with a car driver and a motorcyclist. This is the first research study to ask both car drivers and motorcyclists their opinions on the most common accidents that occur between these two road users, therefore although it may be assumed that, in general, road users blame the other road user for the crash, this has not been directly tested. By identifying and comparing the opinions of car drivers and motorcyclists, this may clarify the beliefs about nature and blameworthiness of these crashes, and therefore have important implications for road safety in terms of guiding researchers and policy makers to suggest new practical applications and interventions. Car drivers' and motorcyclists' opinions are important in regards to the framing and acceptability of road safety interventions, with these opinions influencing their engagement in such interventions.

In light of the previous research, we would expect to find evidence for in-group biases for abstract questions such as "what road user is most likely to cause a motorcyclist to have a road accident", or "what road user is most likely to be to blame for car-motorcycle junction accidents". In contrast, we would predict that if more scenario-specific information is provided for an example of a crash in a particular context, the degree of in-group bias should be reduced and car drivers' opinions about motorcyclists should be found to be more balanced.

1.1. The selection of scenarios

The specific scenarios which were presented to car drivers and motorcyclists in the online questionnaire were chosen from a