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Correlations between mobile phone use and other risky behaviours while riding a motorcycle

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ABSTRACT

Motorcyclist safety is a major concern in many developing countries. Understanding motorcycle riders' risky behaviours, particularly among the younger population, is essential to developing effective interventions. This paper explores the correlations between mobile phone use while riding and other risky riding behaviours as well as the relationships between perceived risks and risky riding behaviours, using an online survey of university students in Vietnam. Results show that calling while riding a motorcycle had the highest prevalence (74%) while reckless overtaking had the lowest prevalence (33.2%). Survey participants who indicated that they had the behaviours of reckless overtaking or riding on sidewalks were around twice as likely to call, text, or search for information while riding. In addition, those who admitted that they rode a motorcycle while under the influence of alcohol were nearly twice as likely to call or text while riding. The results also show that perceived crash risks reduced the likelihood of risky riding behaviours, including calling, texting, searching for information, speeding, running red lights, riding on the wrong side of a road, and riding on sidewalks. A more coordinated approach to enforcement is needed to help reduce the prevalence of multiple risk taking behaviours among motorcyclists.

1. Introduction

Over 1.2 million people across the world each year die on roads, and millions more are seriously injured, costing governments approximately 3% of GDP (WHO, 2015). Globally, motorcyclists account for 23% of all road traffic fatalities. At a regional level, the proportion of motorcycle fatalities is lowest at 7% in Africa and highest at 34% in South East Asia (WHO, 2015). This is attributed to the much higher use of motorcycles in South East Asian countries with 59%, 78%, 83%, and 95% of the vehicle fleet being motorcycles in Thailand, Laos, Indonesia, and Vietnam respectively (WHO, 2015). More importantly, the proportion of motorcycle fatalities has been almost constant in most of the world's regions since 2010 (WHO, 2015), suggesting motorcycle crashes continue to be a major safety issue to be addressed.

An understanding of risky riding behaviours among motorcycle riders is essential to shaping interventions and has therefore been explored in previous research. A self-reported survey of risky riding behaviours in Taipei, Taiwan showed that young and male motorcyclists had a higher tendency to violate traffic regulations, such as riding while intoxicated and riding in the opposite direction, and that young motorcyclists were more likely to neglect potential risks (Chang and Yeh, 2007). A study of school children's motorcycle riding behaviours in Yamunanagar, India found that tailgating and aggressive attitudes towards other riders were associated with being involved in a crash (Rathinam et al., 2007). According to a survey of motorcyclists in Hanoi, Vietnam, risky riding behaviours, such as speeding, running red lights, and reckless overtaking, were strongly influenced by both habits and intentions (Vu and Shimizu, 2007). It is noted that risky behaviours considered in these previous studies do not include mobile phone use while riding a motorcycle. A more recent questionnaire study in Indonesia examined traffic regulation violations among motorcyclists, including mobile phone use while riding, and found that males were less likely whereas young adults and students were more likely to violate traffic regulations (Susilo et al., 2015). However, this study did not report the prevalence of each behaviour, nor were relationships examined between mobile phone use while riding and other forms of risky behaviours.

Given the widespread of mobile phones, recent research has attempted to reveal the prevalence of mobile phone use while riding and associated factors. Observational studies showed that the prevalence of mobile phone use while riding a motorcycle was 0.64% in three Mexican cities (Pérez-Núñez et al., 2013) and 8.66% in Hanoi, Vietnam

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(Truong et al., 2016b). These prevalence rates were based on observations at a specific point in time; however, self-reported prevalence of mobile phone use while riding at any time would be much higher. For example, in Vientiane, Laos, 40% of high school students were found to use a mobile phone while riding, according to a self-reported study (Phommachanh et al., 2016). In Hanoi and Ho Chi Minh City, Vietnam, 80.9% of university students admitted to using a mobile phone while riding a motorcycle (Truong et al., 2017). It was also found that gender, perceived crash risk, and license duration were associated with mobile phone use while riding (Truong et al., 2017). In addition, university students were more likely to use a mobile phone to communicate with friends while riding and those who frequently texted a friend while riding were more likely to experience a crash (De Gruyter et al., 2017). It is worth noting that these studies have only focused one main type of risky behaviour – using a mobile phone while riding.

While previous research has been undertaken to investigate risky riding behaviours among motorcyclists, no research has examined possible correlations between mobile phone use while riding and other risky behaviours. Previous research suggested that young drivers who texted while driving a car were more likely to engage in other risky driving behaviours (Olsen et al., 2013) and engaging in multiple risky driving behaviours increased crash risks (Fergusson et al., 2007). Understanding multiple risk riding behaviours is therefore important for the development of coordinated prevention strategies. In addition, while the relationship between perceived crash risk and mobile phone use while riding has been explored (Truong et al., 2017), little is understood about relationships between perceived risks, both crash and traffic ticket risks, and other risky riding behaviours. This paper therefore aims to explore the associations between mobile phone use while riding and other risky riding behaviours as well as the associations between perceived risks and risky riding behaviours. For this purpose, a survey of university students was conducted in Vietnam given its motorcycle-dominated traffic (NTSC, 2015) and a higher tendency to undertake risky riding behaviours among young adults (Chang and Yeh, 2007; Truong et al., 2016b).

In Vietnam, motorcycle users are involved in more than 70% of road traffic crashes (Hung et al., 2008; NTSC, 2015; Truong et al., 2016a) and contribute to about 58% of all road traffic fatalities (Ngo et al., 2012). This reflects the traffic situation, in which motorcycles account for about 95% of over 41 million registered vehicles (NTSC, 2015). Most motorcycles in Vietnam have an engine capacity of less than 150cc. Between 58% and 77% of young adults aged 21–30 years old own a motorcycle (Tran, 2013) and above 40% of students use motorcycles to travel to their universities (Ohmori et al., 2011).

2. Methods

2.1. Survey

Data regarding risky riding behaviours was collected through an online survey conducted in Vietnam between March and May 2016. The targeted subjects of this survey were students at the University of Transport and Communications' campuses in Hanoi and Ho Chi Minh City. The total number of students at the two campuses was approximately 20,000 students. Several recruitment methods were adopted, including flyers, in-class announcements, and group emails to classes. As this was an anonymous survey, the University did not require ethics approval.

The survey, as part of a wider research project (De Gruyter et al., 2017; Truong et al., 2017), included 18 questions, which respondents could complete in approximately 10–15 min. Survey participants were asked about their age, gender, motorcycle use, and duration of their motorcycle license. Where participants indicated that they rode a motorcycle, they were asked a series of questions about their risky behaviours while riding a motorcycle. The frequency of risky behaviours was measured using a five-point Likert scale i.e. never, a few times a year, monthly, weekly, and daily. Survey participants were also asked about their crash involvement in the last 24 months. This paper specifically focused on survey questions regarding risky behaviours and perceived crash/ticket risks.

Survey participants were asked whether or not they undertook risky behaviours while riding, including using a mobile phone (for calling, texting, searching for information), not wearing a helmet, speeding, running red lights, riding on the wrong side of a road, riding while under the influence of alcohol, recklessly overtaking, and riding on sidewalks. On a five-point scale (in which 1 indicates very unlikely and 5 indicates almost certain), participants were asked about their perceived risks of being involved in a crash and getting a traffic ticket when engaging in each risky riding behaviour. Regarding the behaviour of not wearing a helmet, participants were not asked about their perceived crash risk in order to avoid confusion since this behaviour is more related to the severity of a crash.

2.2. Analysis

Using descriptive statistics, the prevalence of each risky riding behaviour was determined with 95% confidence intervals. Average scores of perceived crash and ticket risks and associated 95% confidence intervals were also calculated. Using binary logistic regression, the effects of gender, the number of years having a motorcycle license, perceived crash risk, and perceived ticket risk on undertaking each risky behaviour were examined. Correlations between calling, texting, and searching for information while riding and other risky behaviours were also investigated using binary logistic regression. Statistical analyses were conducted in the R statistical environment (R Core Team, 2017) and with the use of JASP statistical software (JASP Team, 2017).

3. Results

3.1. Descriptive statistics

After removing 157 invalid and missing-data responses, there were 741 survey participants, including 665 motorcycle riders and 76 non-riders. The analysis in this paper was focused on the 665 participants who rode a motorcycle. Among motorcycle riders, 361 (54.3%) were from Hanoi and 304 (45.7%) were from Ho Chi Minh City. There were 384 males (57.7%) and 281 females (42.3%) with an average age of 21.9 years (standard deviation of 1.8 years). The gender split from the survey was similar compared to the student population in Vietnam where females represent 43.1% of all students (Vu et al., 2012). The average age was slightly higher compared to the typical university student age of between 18 and 23 years old (World Bank, 2008), yet this is expected given that survey participants reported to ride a motorcycle and therefore tend to be older. The average number of years with a motorcycle license was 2.7 years (standard deviation of 2.1 years). A summary of the prevalence and perceived risks of risky behaviours is presented in Table 1.

Calling while riding a motorcycle was the most prevalent risky behaviour with 74% (95% CI, 70.7–77.3%) of respondents reporting to have engaged in this behaviour; this was significantly higher compared to other risky behaviours. The prevalence of riding on sidewalks and speeding was 61.7% (95% CI, 58.0–65.3%) and 60.6% (95% CI, 56.9–64.3%) respectively, followed by riding on the wrong side of a road at 55.6% (95% CI, 51.9–59.4%). Approximately half of the riders indicated that they texted, searched for information, did not wear a helmet while riding, and rode under the influence of alcohol (prevalence of 49.9%, 51.7%, 50.4%, and 51.6% respectively). The prevalence of running red lights was slightly lower at 46.9% (95% CI, 43.1–50.7%). Reckless overtaking has the lowest prevalence at 33.2% (95% CI, 29.7–36.8%), which was significantly lower compared to all other risky behaviours.

Survey participants perceived that riding under the influence of