



Factors related to seatbelt-wearing among rear-seat passengers in Malaysia

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ABSTRACT

The benefit of wearing a rear seatbelt in reducing the risk of motor vehicle crash-related fatalities and injuries has been well documented in previous studies. Wearing a seatbelt not only reduces the risk of injury to rear-seat passengers, but also reduces the risk of injury to front-seat occupant who could be crushed by unbelted rear-seat passengers in a motor vehicle crash. Despite the benefits of wearing a rear seatbelt, its rate of use in Malaysia is generally low. The objective of this study was to identify factors that are associated with the wearing of a seatbelt among rear-seat passengers in Malaysia. Multinomial logistic regression analysis of the results of a questionnaire survey of 1651 rear-seat passengers revealed that rear-seat passengers who were younger, male, single and less educated and who had a perception of a low level of legislation enforcement, a lower risk-aversion and less driving experience (only for passengers who are also drivers) were less likely to wear a rear seatbelt. There was also a significant positive correlation between driver seatbelt and rear seatbelt-wearing behaviour. This implies that, in regards to seatbelt-wearing behaviour, drivers are more likely to adopt the same seatbelt-wearing behaviour when travelling as rear-seat passengers as they do when driving. These findings are crucial to the development of new interventions to increase the compliance rate of wearing a rear seatbelt.

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1. Introduction

Wearing a rear seatbelt has proven to be effective in reducing the risk of death of motorcar occupants, especially rear-seat passengers, in motor vehicle crashes (King and Yang, 1995; Brown and Cline, 2001; Ichikawa et al., 2002; Broughton, 2004; Shimamura et al., 2005; Zhu et al., 2007; Carpenter and Stehr, 2008) because seatbelt can prevent rear-seat passengers from being ejected from the car and help to avoid human collisions amongst the rear-seat passengers and also colliding with front-seat occupants during a road crash.

Based on the Global Status Report of the World Health Organization (WHO) on Road Safety, most countries have enforced seatbelt-wearing for motor vehicle front occupants, however, not many countries; have strict enforcement on the wearing of a rear seatbelt (WHO, 2009). The WHO reported that the compliance rate of rear seatbelt-wearing is higher in high-income countries such as Australia (92%), Sweden (90%), United Kingdom (90%), Germany (88%), Canada (87%), New Zealand (87%), Norway (85%), France

(83%), Czech Republic (80%), Finland (80%), United States (76%) and the Netherlands (73%). The report also showed that most middle-income countries enforced the rear seatbelt legislation but the compliance rates are much lower, such as Peru (25%), Romania (20%), Morocco (19%), Ecuador (10%), Honduras (10%), Mauritius (10%), South Africa (8%), Serbia (5%), Thailand (3%), Namibia (1%) and Oman (1%). Rear seatbelt legislation essentially does not exist in low-income countries.

The literature on rear seatbelt-wearing has demonstrated that the compliance rate is much lower than that with front-seatbelts. A study conducted in the United States reported that seatbelt-wearing among adults in the rear seat was only 50.4% vs. 82.2% for the front-seat (Trowbridge and Kent, 2009). The authors pointed out that the low compliance rate of rear seatbelt-wearing in comparison to the front-seatbelt-wearing may be because the risk of being killed and seriously injured in the rear seat is comparably lower than in the front-seat.¹ In addition, it may be attributed to poor enforcement of rear seatbelt-wearing; and the absence of publicity and promotion of the wearing of rear seatbelts.

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¹ Smith and Cummings (2004) found that the rear-seat position reduced the risk of being killed and seriously injured in a crash by 33% compared with the front-seat passenger position.

In Malaysia,² driver and front passenger seatbelt legislation was enforced in 1978. Kulanthayan et al. (2004) conducted a study in the state of Selangor and revealed that seatbelt-wearing compliance rates among motorcar drivers and front-seat passengers were 76.6% and 56.0%, respectively. Rear seatbelt legislation in Malaysia³ only took effect on January 1, 2009. Six months prior to the launching of the rear seatbelt legislation, the Malaysia Road Safety Department carried out a series of promotional campaigns, such as placing advertisements on the radio and television to raise awareness of the role of rear seatbelt-wearing in promoting motorcar passenger safety (Norlen et al., 2008). One month after the rear seatbelt legislation came into force, the Malaysian Institute of Road Safety Research (MIROS) reported that the compliance rate with rear seatbelt-wearing was 48.15%. However, by October 2009, the compliance rate had decreased to 13.9% (MIROS, 2011). A study conducted in the federal territory of Putrajaya 6 months after the rear seatbelt legislation was introduced also revealed that the rate of rear seatbelt-wearing was low, at just 4.8% (Norlen et al., 2010).

Despite increasing evidence showing that not wearing a seatbelt while travelling is an unsafe practice, many rear-seat passengers still engage in this behaviour. Hence, the objective of this study was to identify the factors that are associated with rear seatbelt-wearing among motorcar occupants in Malaysia. These factors included demographic variables (age, gender, education level, and marital status), perceived enforcement level, the risk-aversion effect, driving experience and driver seatbelt-wearing (for rear-seat passengers who were also drivers). The risk-aversion effect, measured by the disparity between the willingness to accept (WTA) and the willingness to pay (WTP) for road safety, was used to investigate the relationship between risk-averse behaviour and rear seatbelt-wearing behaviour. Two other variables, driving experience and driver seatbelt-wearing behaviour, were used to investigate the rear seatbelt-wearing behaviour of drivers when they travelled as rear-seat passengers. Our aim was to compare the difference between the rear seatbelt-wearing behaviour of drivers (when they are rear passengers) and rear passengers and identify more effective interventions and policies to improve compliance with rear seatbelt-wearing.

The rest of the paper is organized as follows. Section 2 provides the study design, whilst Section 3 presents empirical results. Section 4 contains discussion of the results. Section 5 recommends future research in this area, followed by conclusion in Section 6.

2. The study design

Road safety research has found that attitudes towards and awareness of road safety issues have an impact on on-road risky behaviour and, hence, on the risk of road crashes and injuries (Elander et al., 1993; Sümer, 2003; Ulleberg, 2003; Jonah et al., 2001; Iversen and Rundmo, 2004; Feenstra et al., 2010). In view of this, we hypothesised that rear-seat passengers who have a higher road safety risk-aversion are more likely to wear a rear seatbelt. In examining this hypothesis, the disparity between willingness to accept (WTA) and willingness to pay (WTP) was used to measure the risk-aversion effect on rear seatbelt-wearing.

² Malaysia is classified as an upper middle-income country; it had a population of 28 million and US\$ 7760 gross national income per capita in 2010 (World Bank, 2012).

³ The rear seatbelt legislation in Malaysia stated that all rear-seat passengers shall wear seatbelt and penalty for not wearing the rear seatbelt is MYR 300 (US\$ 98, Exchange rate 1 MYR = 0.3267 US\$). In the event for unbelted rear-seat passenger below 18 years old, the drivers shall be fine MYR 300 (US\$ 98). Exemptions of rear seatbelt legislation are given to vehicles registered before 1 January 1995, vehicle registered after 1 January 1995 without the anchorage point and commercial vehicles.

In general, WTA is a monetary measure of a small risk increase, and WTP is a monetary measure of a small risk reduction. Both WTA and WTP emphasise the importance of individual preferences in changes in the level of risk. In this study, WTP denotes the maximum amount of money someone is willing to pay to obtain protection to reduce their risk in terms of road safety, and WTA denotes the minimum amount of money that someone willing to accept to relinquish their protection and increase their risk in terms of road safety. Both WTA and WTP have been shown to vary with socioeconomic characteristics (Gerking et al., 1988; Tanrivermis, 1998; Anderson, 2007).

Previous studies of WTA and WTP have demonstrated that there is a discrepancy or a gap between the WTA and WTP (Brown and Gregory, 1999; Kahneman et al., 1990; Mansfield, 1999; Tomohara, 2005; Ramjerdi and Dillen, 2007; Viscusi and Huber, 2012). This discrepancy, also known as disparity is the ratio between the minimum WTA and the maximum WTP. People often place a higher WTA on an owned object rather than WTP on an object if it is not in their possession. This asymmetry between gains and losses is referred to as the endowment effect. The endowment effect is often explained in terms of loss aversion (Kahneman et al., 1990; McDaniel, 1992; Brown and Gregory, 1999; Venkatchalam, 2004) that captures intrinsic human traits; loss aversion is always observed to cause risk-aversion (Kobberling and Wakker, 2005). A higher disparity indicates risk-aversion to losses, and a lower disparity indicates risk seeking in gain. Hence, a person with a higher disparity (greater WTA compared to WTP) will tend to protect themselves by wearing a seatbelt when they travel as rear-seat passengers.

Social integration theory focuses on how social interactions with family, friends, community and society create social support, which is associated with an individual's self-esteem, physical well-being and sense of commitment to society (Durkheim, 1951). The literature on social integration has demonstrated that a lacking of social integration can lead to deviant and risky behaviour such as suicide (Park and Lester, 2006; Agerbo et al., 2011; Poudel-Tandukar et al., 2011) and increase the mortality rate (Umberson, 1987; Berkman et al., 2004). In contrast, marriage indicates maturity and responsibility, and it is usually attributed to positive effects of social integration. According to Kposowa (2000), marriage can help prevent suicide by providing social support and emotional stability to an individual. Travelling without wearing a rear seatbelt is considered to be a risky behaviour, which is very similar to suicide. In this study, marital status was used as an indicator of social integration to explain the seatbelt-wearing behaviour amongst rear-seat passengers. We predicted that rear-seat passengers who are married would be more likely to wear rear seatbelts compared to passengers who were single on the basis that marriage is associated with diminished participation in risky behaviours.

2.1. The questionnaire survey

We designed a questionnaire to obtain information about a range of factors regarded as likely to influence rear seatbelt-wearing behaviour. The questionnaire for this study was translated into the Malay and Mandarin (Chinese) languages to take account of the local language and norms. It was then piloted and reviewed before administration. The data were collected from individuals throughout Malaysia during face-to-face interviews from May to July of 2011. The survey was conducted by trained enumerators and used a random selection of 2000 individuals.

The questionnaire survey consisted of four parts. The first part involved an eligibility screening to determine the eligibility of the respondents to participate in the survey. In the eligibility screening, only respondents who travelled on car were surveyed, public transport, motorcycle or bicycle travellers were not included. The

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