

## A Descriptive Study on Safety Perception among Ride-Hailing Car Passengers in Malaysia

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### Abstract

Recently, major ride-hailing car (RHC)-related safety issues have become more prevalent in Malaysia. Due to distracted driving, speeding, irregular working schedules and exposure to a various of unsafe road environment circumstances, road traffic accidents are extremely likely to happen to RHC drivers. Consequently, the aim of this study is to examine road safety perception among RHC passengers in Malaysia. There are six section in the questionnaire comprising respondent's background, travel behaviour and pattern, safety perception, driving behaviour factors, vehicle safety factors and road environment factors. A convenient sampling was used and the sample comprised of 350 random RHC passengers. Descriptive statistical analysis revealed that a disagreement and neutral level of respondents for the questions asked especially for driving behaviour factors and vehicle safety factors. Nevertheless, the responses were generally around neutral and high agreement for the road environment factors. Based on the results, the findings of the study were also discussed.

**Keywords:** *Ride-Hailing Car, Driving Behaviour Factors, Vehicle Safety Factors, Road Environment Factors, Safety Perception*

### Introduction

Public transportation (PT) has grown to be one of Malaysia's most crucial components in assuring the long-term viability and expansion of a metropolitan area as a result of phenomenal socioeconomic growth in the Klang Valley (Dahalan et al., 2015). The PT system includes a number of options such as taxi, bus, and rail services. A big part of PT system in Malaysia is played by the taxi sector, which includes both conventional taxis (CT) and ride-hailing cars (RHC) services. This is due to the fact that a large number of Malaysians use it as a form of transportation that can travel through any part of a journey (SPAD, 2015). In terms of offering passengers convenience and comfort, this service offers greater flexibility, saves time, and is regarded as the most cost-effective and accessible kind of transportation (Aarhaug, 2014). This has considerably raised both the reputation and demand for this

service. The RHC system concept was established due to recently developed technology, which has had a considerable impact on the CT sector in recent years. The system has undergone structural changes that allow customers to order a RHC from any location using their smartphone with improved taxi-waiting and journey lead times. This is advantageous for passengers by replacing the need to wave down or hail a taxi on the roadways. Approximately 150,000 ride-hailing drivers are employed by 33 ride-hailing providers that have been granted operating licences by the Land Public Transport Agency (APAD) to date (Bernama, 2021; APAD 2021). This resulted in a direct rival for CT, gave customers an alternative, and ultimately raised service standards while fostering healthy competition among taxi drivers. Even though there is a considerable growth in demand for RHC services, a number of problems affect the safety of the passengers. Due to distracted driving, driver tiredness, and driver sleepiness, RHC are at an extremely high risk of automobile accidents.

Engagement with a smartphone application is required for a ride-hailing service to operate, which is a known factor that is associated with an increased risk of accident (Klauer et al., 2014; Dingus et al., 2016; Guo et al., 2017; Truong and Nguyen, 2019). When engaging any kind of mobile phone-based application, whether hands-free or not, the likelihood of distracted driving is likely to increase. Using a mobile phone app to reach out to potential passengers while driving is unquestionably distracted driving. Such distraction puts passengers, together with pedestrians and other vehicles around, in danger and increases the likelihood of an accident (Dills and Mulholland, 2018). Because they use their mobile phones more frequently than other drivers, RHC drivers are therefore at a higher risk. In addition, RHC are more likely to be involved in an automobile accident because of significantly higher exposure on the roads (Mao et al., 2020). RHC drivers frequently travel at high speeds in order to save time and earn more money (Sui et al., 2019). Moreover, the high vehicle density and the fact that a driver's salary was based on the number of passengers further contributed to the unsafe driving practises that were common on urban roadways (Zhao et al., 2014). Some RHC drivers could choose to do longer shifts through traffic jams when there is a high demand during rush hour. As driving in traffic jams is connected with a higher crash risk, therefore, the risk of a crash is larger while operating during rush hour. Furthermore, the extended hours that many RHC drivers put in along with stressful or physically challenging tasks can cause significant tiredness and sleepiness (Stern et al., 2019; Peng et al., 2022; Robbins et al., 2022). Consequently, road traffic accidents involving RHC become more common (Tseng, 2013; Chung and Chang, 2015). In light of these, this study was conducted to examine safety perception among RHC passengers in Malaysia.

### **Literature Review**

The ride-hailing sector has experienced rapid growth in recent years all around the world. The expansion has been extraordinary, and Uber, the biggest ride-hailing company in the world, has reportedly provided more than 2 billion rides worldwide since its founding in 2010 (Morrison et al., 2018). In Malaysia, approximately 150,000 e-hailing drivers work for 33 ride-hailing providers (Bernama, 2021; APAD 2021). Although there has been a considerable growth in the demand for ride-hailing services recently, a study by Meltwater (2017) indicated that driver behaviour is a big issue for many customers. In particular, the analysis revealed that 82% of RHC drivers' complaints and grouses were submitted by Malaysians. "Unsafe", "rude", and "dangerous" are phrases regularly used to describe driver behaviour throughout the region. This issue has received a lot of media attention due to the recent intense discussion in Malaysia on RHC-related safety. Therefore, the risk domains as well as risk

indicators that contribute to road traffic accidents (RTA) must be identified in order to carry out interventions and potentially lower the risks associated with RTA. A risk domain is an element that increases the possibility of an accident (Elvik and Vaa, 2004). The risk of an accident and the degree of injuries have been found to be significantly influenced by the domains of driver, vehicle, and road environment factors in prior studies (Boufous et al., 2008; Thompson et al., 2013; Zhang et al., 2013 Kadilar, 2014).

According to the literature, the most frequent factor influencing road safety is driving behaviour (Allahyari et al., 2008; Dingus, 2016; Weber et al., 2018). Additionally, both the vehicle and the road environment factors have the potential to cause a driver to make a mistake, which then becomes the primary contributor to the accident (Babić et al., 2020). A number of past studies indicated that there are a number of driving behavior-related risk indicators that are significantly linked to RTA, including exceeding the speed limit, running red lights, lane deviation, improper seatbelt use, tailgating, street racing, middle-lane hogging, passing on the left, failing to check the rear-view mirror, failing to use turn signals, crossing the centre line, failing to stop at intersections, using a hand-held phone, and secondary task distraction. In addition, it is discovered that a key contributing factor to RTA is the vehicle conditions (Cuerden et al., 2011; Jones, 2016; Montero-Salgado et al., 2022). A number of vehicle safety risk indicators are connected to RTA, including bald tyres, unexpected mechanical failures while driving, broken rear seatbelts, the absence of side airbags, the absence of a fire extinguisher, the absence of a rear-view camera, and older vehicles. Furthermore, the road environment elements affected the performance of the vehicle and the driver during driving (Zulhaidi et al., 2009; Batrakova & Gredasova et al., 2016; Kim et al., 2016; Wu et al., 2021). Moreover, this element might promote and support the development of safe driving behaviours. Nighttime driving, streetlights, traffic lights, severe rain, crosswinds, sun glare, fog, poor road markings and traffic signs, road pavement failure, roadside hazards, and traffic jams are significant risk indicators for road environment factors.

### **Methodology**

The main methodology in this study was a descriptive research design with a questionnaire survey. Several risk indicators were chosen in accordance with their measurability and relevance to the analyzed phenomenon. These questions were then adapted to suit the objective of this study. In this study, there were six sections in the questionnaire. The purpose of the questionnaire's Section A was to collect data on the respondents' demographics while the Section B contains information about travel behaviour and patterns. In Section C, there are 14 questions that connect the driving behaviour factors and the measurement of these factors were designed by adapting from Yannis et al. (2005) and Spano et al. (2019). In Section D, there are 7 questions regarding to the vehicle safety factors and the measurement of these factors were designed by adapting from Havârneanu (2012), RoSPA (2015) and Espinoza Molina et al. (2021). In Section E, there are 11 questions that are related to the road environment factors and the measurement of these factors designed by adapting from Sullivan et al. (2011), Walker (2018) and Espinoza Molina et al. (2021). In section C, D and E, a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) was used to evaluate these questions. Last but not least, the section F includes several questions about perceptions of respondents regarding to the safety of RHC in Malaysia. A convenient sampling was used to select the respondents for this study and the sample comprised of 350 random RHC passengers. The targeted respondents was an English-speaking passengers with prior

travel experience using RHC and the instrument was distributed using online survey approach. Finally, all the collected data were analyzed by using IBM SPSS Statistics Version 20.

## **Results**

### **Demographic Profile**

The majority of the respondents were females (72.6%) while the rest were males (27.4%). Besides that, 67.4% of the respondents were Chinese, 24.3% of the respondents were Malay, 3.7% of the respondents were Indian and 4.7% were other ethnicity. In additions, the survey revealed that 92.6% of the total respondents were never married and the rest of them were married (7.4%). From the perspective of education level, majority of the respondents were bachelor degree holder (76.9%), followed by master degree holder or higher (13.1%), diploma (6.3%), and secondary school (3.7%). Furthermore, 51.4% of the respondents did had a car while 48.6% of the respondents did not had a car. In terms of RHC usage, highest percentage of the respondents used RHC because of they did not have a vehicle at the time (28.3%), followed by difficulty in parking (24.9%), cannot drive (12.3%), not familiar with the road network (12%), faster mode of travel (6.7%), less expensive mode of transportation (4.9%) while other reason (6.3%). Regarding average journey time, greater number of respondents travels between 15 minutes to 29 minutes (48.9%) followed by less than 15 minutes (29.1%), between 30 to 44 minutes (12.9%), more than 60 minutes (5.1%) and between 45 to 59 minutes (4.0%). Generally, most of respondents preferred to travel in the afternoon (56.3%), followed by morning (22%), evening (13.4%) and night (8.3%). More specifically, more than half of the respondents preferred weekdays to travel (52.3%), followed by weekends (42.6%) and public holiday (5.1%). On the other hand, 69.1% of the respondents preferred to travel with a companion while 30.9% preferred to travel alone. Regarding to RHC driver preference, most of respondents feel indifferent regardless the gender of RHC driver (48.3%), followed by female RHC driver (40.3%) and the least choice was male RHC driver (11.4%). In comparison with CT, more than half of the respondents have agreed that RHC was safer than CT (61.7%), 32.3% of the respondents have neutral opinion while other respondents have disagreed (6.0%).

### **Questionnaire Results**

Regarding to driving behaviour factors in Table 1, it was likely to conclude that respondents were disagree on the statements that most of the ride-hailing car drivers were disregard the speed limits, cross a junction when the traffic lights have already turned red, difficult in maintaining lane position, improper wearing a seatbelt, fail to remain in the proper lane, become impatient and overtake on the outer (left) lane, fail to check rear-view mirror before changing lanes, overtake someone without signalling, overtake at a double line, fail to stop at junction and having another in-vehicle (internal) distractions. Respondents were also highly disagree that most of the ride-hailing car drivers were often get involved with unofficial "races" with other drivers. Nevertheless, respondents were neutral that most of the ride-hailing car driver using mobile phone while driving.

**Table 1. Descriptive results for driving behaviour factors**

<b>Driving Behaviour Factors (2.407)</b>	<b>Mean</b>	<b>Std. Deviation</b>
Disregard the speed limits on a motorway	2.64	.916
Cross a junction knowing that the traffic lights have already turned red.	2.31	.969
Difficult in maintaining lane position	2.49	.972
Improper wearing a seatbelt while driving	2.03	.968
Drive especially close to the car in front as a signal to go faster or get out of the way	2.51	1.070
Get involved with unofficial "races" with other drivers	1.93	.939
Fail to remain in the proper lane	2.25	.927
Become impatient with a slow driver in the inner lane and overtake on the outer (left) lane	2.83	1.144
Fail to check rear-view mirror before changing lanes	2.36	.958
Attempt to turn or overtake someone without signaling a left or right turn	2.61	1.109
Overtake at a double line	2.38	1.025
Fail to stop at junction	2.17	.915
Use mobile phone while driving	3.05	1.180
Having another in-vehicle (internal) distractions such as smoking, eating and drinking while driving	2.14	.989

The results of vehicle safety factors in Table 2 revealed that the respondents were disagree on the statements that most of the ride-hailing car have used bald tyre, have sudden mechanical failure during operation, malfunctioning of rear passenger's seatbelts, have no side airbags installation, have no fire extinguisher, have no rear view camera and look old.

**Table 2. Descriptive results for vehicle safety factors**

<b>Vehicle Safety Factors (2.357)</b>	<b>Mean</b>	<b>Std. Deviation</b>
Using bald tyre	2.34	.823
Sudden mechanical failure during operation	2.02	.886
Malfunctioning of rear passenger's seatbelts	2.07	.978
No side airbags installation	2.21	.938
No fire extinguisher	2.82	1.160
No rear view camera	2.59	1.178
Look old	2.45	1.008

According to road environment factors in Table 3 demonstrated that the perception of respondent were neutral on the statements that road traffic accident can easily happen to ride-hailing car when driving at night, driving over a pothole, the presence of traffic congestion, there is crosswind, sun glare and fog, there are poor road markings and traffic signs, as well as there are street parking or roadside objects. However, respondents were agree that road traffic accident can easily happen to ride-hailing car when existing streetlights and traffic lights is not working properly, as well as there is rainy weather.



**Table 3. Descriptive results for road environment factors**

Road Environment Factors (3.893)	Mean	Std. Deviation
Driving at night	3.62	.994
The existing streetlights is not working properly	4.06	.881
The existing traffic lights is not working properly	4.05	.901
There is rain	4.28	.787
There is crosswind	3.76	.917
There is sun glare	3.79	.905
There is fog	3.81	.904
There are poor road markings and traffic signs	3.89	.948
Driving over a pothole	3.98	.892
There are street parking or roadside objects	3.81	.918
The presence of traffic congestion	3.77	.873

### Discussions

In Malaysia, serious issues with RHC related to safety have gotten worse recently. Due to distracted driving, speeding, irregular working schedules and exposure to a various of unsafe road environment circumstances, road traffic accidents are extremely likely to happen to RHC drivers. Therefore, the aim of this study was carried out to examine safety perception among ride-hailing car passengers in Malaysia. A descriptive exploration was performed on demographic information and three risk domains including driving behaviour factors, vehicle safety factors and road environment factors. Based on demographic perspective, majority of the respondents were females, Chinese, never married and category bachelor degree holder. In terms of RHC usage, highest percentage of the respondents used RHC because of they did not have a vehicle at the time and regarding average journey time, greater number of respondents travels between 15 minutes to 29 minutes. Generally, most of respondents preferred to travel in the afternoon and specifically, more than half of the respondents preferred weekdays to travel. In addition, 69.1% of the respondents preferred to travel with a companion while 30.9% preferred to travel alone and most of respondents feel indifferent regardless the gender of RHC driver (48.3%). In comparison with CT, 61.7% of the respondents have agreed that RHC was safer than CT, 32.3% of the respondents have neutral opinion while 6.0% of the respondents have disagreed.

According to the risk domains exploration, it can be concluded that the results of descriptive analysis revealed that a disagreement and neutral level of respondents for the questions asked especially for driving behaviour factors and vehicle safety factors. However, the responses were generally around neutral and high agreement for the road environment factors. Regarding to road environment factors, respondent were neutral on statements that road traffic accident can easily happen to ride-hailing car when driving at night, driving over a pothole, the presence of traffic congestion, there is crosswind, sun glare and fog, there are poor road markings and traffic signs, as well as there are street parking or roadside objects. In addition, respondents were agree that road traffic accident can easily happen to ride-hailing car when there is rainy weather as well as malfunctioning of the streetlights and traffic lights. Therefore, driving carefully during rainy weather and frequent maintenance for both streetlight and traffic light are required to increase the safety performance of RHC. These findings provide a significant contribution to the understanding of safety perception of RHC

in Malaysia. Furthermore, it can serve as a foundation for the authority and RHC operator to design appropriate intervention to increase the safety performance of RHC in Malaysia.

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