

## ORIGINAL ARTICLE

# Risk-Taking Behaviour among Vehicle Users at an Intersection Road

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*Abstract: Up till today, road accidents have shown an increment of cases from year to year. This situation raises concern not only for the respected body that handles this case but also for the public. There are numerous causes that lead to road accidents and one of them is the risk-taking behaviour among the road users themselves. This behaviour might be influenced by factors such as demographics and personal which falls under the character of the road users. Hence, this study is carried out in order to investigate the relationship between demographics and personal factors in the risk-taking behaviour of vehicle users particularly at the National University of Malaysia (UKM). The method used to gain the data and information is a subjective assessment that is distributed via a questionnaire among respondents based on the frequency of their usage of the intersecting road in UKM. The process of data analysis consists of several methods including the T-test, ANOVA and Regression. The findings of this study show that all of the items in the section on demographic factors such as gender, age, frequently used vehicle, driving experience, accident involvement and items in personal factors are influenced by other road users, family guidance, accident involvement, awareness of the traffic law enforcement, confident level after involving in an accident, and prevention steps after involved in road accidents does influence the items in the risk-taking behaviour among the vehicle user. The findings from this study have the potential to help the government and certain agencies to identify this risk-taking behaviour among drivers and help reduce the number of road accidents, especially inside the area of the National University of Malaysia (UKM).*

**Keywords: Risk-taking Behaviour, Demographics, Personal and Social.**

## 1.0 INTRODUCTION

Road accident has currently become among the main contributor to death and injury [1]. Statistics have shown that approximately two million people around the world died and as many as three hundred thousand people have been injured daily due to road accidents [2]. This issue is very serious and should not be taken lightly.

The level of road safety especially at an intersection road depends on several factors such as the level of traffic, the traffic light management, and the behaviour of the vehicle users themselves [3]. The

behaviour of a vehicle user is considered a very influencing factor in the aspect of road accidents. Even with the awareness from public about this issue, the behavioural problem of road users still has not been given enough attention in past studies.

There are several key factors influencing accident incidents at intersections including traffic features, traffic control techniques, geometric design, and driver characteristics. Numerous studies have examined the effects of traffic and geometric features on the frequency of accidents at intersections including the arrangement of signal time control lanes, types of collisions, and conditions approaching intersections [3]. In addition, several studies have also studied the influence of these factors on the severity of accidents at intersections [3].

The risk-taking behaviour of vehicle users at an intersection has become a problem that potentially leads to road accidents. This behaviour may be affected by the driver's characteristics such as their background, demographic and personal factors. Furthermore, road element is also said to be among the factors that contribute to the number of road accidents [3], [4]. An intersection road is a very common element for road traffic where the road is a location that is frequently related to road accidents according to [3].

Many past studies supported that demographic factors are closely related to the behaviour of an individual. Demographic factors such as age, gender, level of education, employment status, monthly income, etc. play an essential role in shaping an individual's behaviour. A study conducted by Amadi, Ogadimma, and Taiwo [5], entitled the relationship between demographic and personal factors to aggressive behaviour by adolescents in high school agrees with a previous study by Lee-Bagglely, Preece, and DeLongis [6] which explains that individuals are easily emotional where they react emotionally to events that are not considered significant by other individuals. Their negative emotional response tends to persist for an abnormally long term, in other words, they will usually be in a bad emotional state. The conclusion from this study indicates that demographic, personal and social factors are closely related to determining an individual's behaviour.

Most of the past studies regarding driving behaviour focused on the general effect of the behaviour of vehicle user's at an intersection road [3]. Instead, in the context of risk-taking behaviour, there is still not much information [3]. Hence, this study is conducted in order to find the relation

between demographic factors such as gender, age, accident involvement, driving experiences, and also personal aspects to their risk-taking behaviour at an intersection. The aim and findings of this study have the potential to help the effort of certain organisations to identify the group of the population that is prone to this type of behaviour in order to reduce the number of road accidents occurring.

## 2.0 METHODS

### *Participants*

120 participants between the ages of 18 to 55 years were involved in this study. Out of 120 participants, 67 were female and the rest is male. Participants were required to own a valid driving license and drive for an average of an hour a day. Participants were between the ages of 16 to 55 years old and are selected among UKM regular road users since the intersection roads selected for this study are located at the main entrance of UKM. Firstly, participants had to fill up a form consisting of demographic information which includes gender, age, and driving experience.

### *Subjective Evaluation*

This study uses a subjective evaluation method to gather information from the participants that are related to the demographics of vehicle users in UKM. The information obtained from this questionnaire will be analysed to study the relationship between demographics and personal factors in the risk-taking behaviour of vehicle users. Therefore, this questionnaire is specially designed to obtain the objective of this study. The questionnaire consists of several sections which are assessed using category scales and Likert scales. Based on a study conducted by Borhan et al. [3] who studied the risk behaviour of motorcyclists, the method used is similar which is by distributing questionnaires among the participants.

The survey questions are divided into three main sections namely demographics, risky behaviour and personal information. This study takes the same approach with slight changes to the research method to adapt to the objectives of this study. The first part consists of five items designed to determine the demographic information of the respondents, namely age, gender, driving

experience and accident involvement. This section is measured using the category scale. The second part contains 14 statements on risk-taking behaviour RTB. For example, "I usually stop at a stop sign".

The last section deals with personal factors and contains 25 items. These 25 items are divided into six parts. Four items are influenced by other vehicle users such as, "other vehicle users can influence me to switch on red lights on intersecting roads"; five items are related to the guidance of family members such as, "my parents know who I will meet when I go out"; four items are related to a past accident experienced such as, "I have been involved in an accident at an intersection"; four items are related to the concerned with the enforcement of traffic rules such as, "I think the police are too strict in enforcing traffic rules"; five items are related to preventive measures after being involved in an accident such as, "After being involved in a motorcycle accident, I change my behaviour and drive safely"; and three items related to the level of confidence after being involved in an accident such as, "I can prevent road accidents, especially at an intersection, by wearing a seat belt". These items are adapted and developed from a case study on risk-taking behaviour among motorcyclists in the Klang Valley, Malaysia, conducted by MIROS [7] which implemented and adapted survey questions.

#### *Data analysis*

In this study, the data were analysed in two different stages. In the first stage, the data for the demographic section were analysed using two different approaches. Demographic items with two or fewer factors (i.e. gender, employment status, frequently used vehicle type and involvement in accidents) were analysed using the t-test method, while demographic items with more than three factors (i.e. age, education level, employment sector, monthly income and driving experience) were analysed using the Scheffe Post-Hoc ANOVA method. Significant differences will exist between the two groups if the significant values are equal to or less than 0.05 ( $p < 0.05$ ).

In the second stage, the data of the personal and social factors are analysed using the Multiple Linear Regression analysis to determine their significant value. Factors that indicate the least significant value are considered important in predicting personal and social factors of risk-taking of vehicle users.

### 3.0 RESULTS AND DISCUSSION

The results from the survey were analysed and a table was tabulated in order to show each important data for the study. Each of the data regarding the relationship between items in demographic factors such as gender, age, frequently used vehicle, driving experience and accident involvement to the item in risk-taking behaviour RTB was explained in this section. The demographic factors section has two categories of answers that have been analysed using the independent sample t-test method while the demographic factors section which has more than two categories of answers is being analysed using the one-way ANOVA method.

The relevance of data to risky behaviours RTB3, RTB5, RTB6, and RTB8 as shown in Table 1 for gender matters shows that on average male gender is more likely than gender women to take risks by not slowing down the vehicle when the traffic light turns yellow which RTB3. The male gender is also on average more likely than the female gender to take risks by driving dangerously in a state of urgency which is RTB5. They are also on average more likely than the female gender to take risks by travelling during peak traffic times which is RTB6. In addition, the male gender is also on average more likely than the female gender to take risks by driving/riding a vehicle above the speed limit that has been set which is RTB8. This is parallel with a study that has been conducted, where it was found that the male gender is less concerned about the risk of road accidents [8].

**Table 1.** Mean data between gender to risk-taking behaviour

Item	Gender		P P<0.05
	Male	Female	
RTB3	0.32	0.16	0.045*
RTB5	0.67	0.41	0.019*
RTB6	0.68	0.25	0.001*
RTB8	0.72	0.38	0.004*

Instead, the relevance of the data to risky behaviours RTB2, RTB5, and RTB13 for age matters in the demographic factors section as shown in Table 2 shows that the average respondents aged 46 up to 55 years old are more likely to take risks compared to other age categories by not inspecting the vehicle before using it i.e. RTB2. They are also more likely to take risks compared to other age categories by not driving carefully when in a state of urgency is RTB5. Furthermore, these respondents

are more likely to take risks compared to other age categories by not practising the four-second rule when driving / riding in the back of another vehicle which is RTB13. In an article by Karthaus and Falkenstein [9], older drivers tend to have accidents due to failing to see properly, failing to assess the road or speed of others, performing poor bends or manoeuvres or losing control of their vehicles.

**Table 2.** Mean data between age to risk-taking behaviour

Item	Age				P P<0.05
	16 - 25	26 - 35	36 - 45	46 - 55	
RTB2	0.59	0.88	1.00	1.75	0.025*
RTB5	0.47	0.63	0.57	1.50	0.006*
RTB13	0.70	0.88	1.00	1.75	0.029*

On the other hand, referring to the experience of driving or riding a motorcycle in the demographic factors section, the relevance of the data indicates that the experience of driving or riding plays a role in RTB5 risky behaviour as shown in Table 3. Respondents who have experience driving or riding a motorcycle for four years and above on average are more likely to take risks than respondents who have a period of experience driving or riding other motorcycles by not driving carefully while in a hurry is RTB5. Theoretically, a long driving experience has the potential to make an individual careless about something simply because the recurring state of things makes it less stimulating to the brain.

**Table 3.** Mean data between driving experience to risk-taking behaviour

Item	Driving experience				P P<0.05
	Below 1 years	1 - 2 years	3 - 4 years	4 years and above	
RTB5	0.42	0.35	0.47	0.80	0.012*

Next, for frequently used vehicles in the demographic factor section, the relevance of the data shows that frequently used vehicle items play a role in RTB6, and RTB12 risky behaviours as shown in Table 4. On average, respondents who use motorcycles as a daily vehicle are more likely than respondents who use cars as daily vehicles to take risks by travelling at peak hours RTB6. Furthermore, respondents who use motorcycles as a daily vehicle are also on average more likely to take risks than respondents who use cars as a daily vehicle by not looking in the side mirror when

trying to make a turn that is RTB12. Studies conducted by Cordellieri et al. [8] also stated that motorcyclists are more likely to take risks compared to those who drive cars.

**Table 4.** Mean data between frequently used vehicles to risk-taking behaviour

Item	Frequently used vehicle		P P<0.05
	Motorcycle	Car	
RTB6	0.58	0.29	0.024*
RTB12	0.38	0.20	0.033*

Finally, as for the involvement in accidents in the demographic factors section, the relevance of the data shows that involvement in accidents plays a role in risky behaviours RTB1, RTB4, and RTB10 as shown in Table 5. On average, respondents who have been involved in accidents are more likely to take risks than respondents who have never been involved in accidents by not stopping the vehicle at the stop sign that is RTB1. Theoretically, a stop sign is just an indication to slow down the vehicle and be ready to stop. However, respondents who have never been involved in an accident on average are more likely to take risks than respondents who have been involved in an accident by not turning left and right before making a turn that is RTB4. Respondents who have never been involved in accidents are also on average more likely to take risks than respondents who have been involved in accidents by not slowing down vehicles in crowded areas namely RTB10. As we have seen from previous studies, accident time experiences can affect individual attitudes [10] and changes in attitudes may directly or indirectly affect every social interaction including driving and riding a motorcycle [1].

**Table 5.** Mean data between accident involvement to risk-taking behaviour

Item	Accident involvement		P P<0.05
	Yes	No	
RTB1	0.78	0.43	0.028*
RTB4	0.10	0.30	0.011*
RTB10	0.07	0.20	0.037*

#### 4.0 CONCLUSION

The data obtained from this study clearly show that there is a relationship between demographic and personal factors to risky behaviour by vehicle users. The finding and data of this

study have the potential to help the effort from certain organisations to identify the group of the population that is prone to this type of behaviour in order to reduce the number of road accidents occurring or in the case of this study, the finding can help assist the efforts of the security forces, especially in UKM to further improve the level of road safety in UKM.

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