ORIGINAL ARTICLE

# Risk Taking Behaviour Among Vehicle User at an Intersection Road

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## ABSTRACT

**Introduction:** Up till today, road accidents have shown increment of cases from year to year. This situation raises concern not only to the respected body that handles this case but also to the public. There are numerous causes that leads to road accident and one of them is the risk-taking behaviour among the road user's itself. This behaviour might be influenced by the factor 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 to the risk-taking behaviour of vehicle's users particularly in the National University of Malaysia (UKM). **Methods:** The method used to gain the data and information is by using a subjective assessment that are distributed among respondents based on frequency of their usage of the intersecting road in UKM. The process of data analysis consists of several method including the T-test, Anova and Regression. **Results:** The findings of this study shows that all of the item in the section of demographics factor such as gender, age, frequently used vehicle, driving experience, accident involvement and items in personal factors which are influenced form other road user, family guidance, accident involvement, awareness of the traffic law enforcement, confident level after involve in accident, and prevention steps after involved in road accidents does influence the items in the risk-taking behaviour among the vehicle user. **Conclusion:** 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 amount of road accident especially inside the area of the National University of Malaysia (UKM).
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## INTRODUCTION

Road accident has currently become among the main contributor to death and injury according to (1). Statistics have shown that approximately two million people around the world died and as much 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 factor such as the level of traffic, the traffic light management, and the behavior of the vehicle user's itself (3). The behavior of a vehicle user is considered as a very influencing factor in the aspect of road accident. Even with the awareness from the public about this issue, the behavioral problem from the road user itself 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 behavior of a vehicle users at an intersection have become a problem that potentially leads to road accidents. This behavior may be affected by the driver characteristics such as their background, demographic and personal factors. Furthermore, road element is also said to be among the factors that contributes 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 are frequently related to road accidents according to (3).

There are many past studies supports that the demographic factors are closely related to the behavior of an individual. Demographic factors such as age, gender, level of education, employment status, monthly income, etc. play an important role in shaping an individual's behavior. In a study conducted by (5) entitled the relationship between demographic and personal factors to aggressive behavior by adolescents in high school agrees with a previous study by (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 abnormal 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 in determining an individual's behavior.

Most of the past study regarding driving behavior focused on the general effect by the behavior of vehicle user's at an intersection road (3). Instead, in the context of risk-taking behavior, there are still not much information (3). Hence, this study in conducted in order to find the relation between demographics factor such as gender, age, accident involvement, driving experiences, and also personal aspects to their risk-taking behavior at an intersection. The aim and finding of this study have the potential to help the effort from certain organization to identify the group of population that prone to this type of behavior in order to reduce the amount of road accident occurring.

## MATERIALS AND METHODS

### Participants

120 participants between 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 owned a valid driving license and drive for an average of an hour a day. Participants were between age 16 to 55 years old and are selected among UKM regular road users since the intersection roads selected for this study is located at the main entrance of UKM. Firstly, participants had to fill up a form consist of demographic information which includes gender, age, and driving experience.

### Subjective Evaluation

This study uses 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 to the risk-taking behaviour of vehicle's users. Therefore, this questionnaire is specially designed to obtain the objective of this study. The questionnaire consists of several sections and are assessed using category scales and likert scales. Based on a study conducted by (3) who studied the risk behaviour of motorcyclists, the method used are similar which is by distributing questionnaire 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. There are four items that are influenced by other vehicle users such as, "other vehicle users can influence me to turn 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 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) where it is an 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 method to determine its significant value. Factors that indicate the least significant value are considered important in predicting personal and social factors of risk taking of vehicle users.

## ETHICAL CLEARANCE

This study was approved by Research Ethics Committee Secretariat, Universiti Kebangsaan Malaysia No PPI/111/8/JEP-2019-529

## RESULT

The result form the survey was analyzed and a table was tabulated in order to show each important data for the study. Each of the data regarding the relation between items in demographic factor such as gender, age, frequently used vehicle, driving experience and accident involvement to the item in risk taking behavior RTB was explain in this section. Demographic factors section which has two categories of answers that have been analyzed using independent sample t-test method while demographic factors section which has more than two categories of answers are being analyzed using the one-way Anova method.

The relevance of data to risky behaviors RTB3, RTB5, RTB6, RTB8 as shown in Table I 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 also on average more likely than the female gender to take risks by traveling 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 in excess of the speed limit that has been set which is RTB8.

Instead, the relevance of the data to risky behaviors RTB2, RTB5, RTB13 for age matters in the demographic factors section as shown in Table II shows that the average respondents aged within 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 that is RTB5. Furthermore, these respondents are more likely to take risks compared to other age categories by not practicing the four-second rule when driving / riding in the back of another vehicle which is RTB13.

**Table I. Mean data between demographic factor gender to risk taking behavior**

| Item | Gender | | P |
|---|---|---|---|
| | **Male** | **Female** | P<0.05 |
| 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* |

**Table II. Mean data between demographic factor Age to risk taking behavior**

| Item | Age | | | | P |
|---|---|---|---|---|---|
| | **16-25** | **26-35** | **36-45** | **46-55** | P<0.05 |
| 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 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 a motorcycle plays a role in RTB5 risky behavior as shown in Table III. 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 / riding other motorcycles by not driving carefully while in a hurry that is RTB5. Theoretically, a long driving experience has the potential to make an individual careless about something simple because the recurring state of things makes it less stimulating to the brain.

**Table III. Mean data between demographic factor Driving experience to risk taking behavior**

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

Next, for frequently used vehicle in the demographic factor section, the relevance of the data shows that frequently used vehicle items play a role in RTB6, and RTB12 risky behaviors as shown in Table IV. On average, respondents who use motorcycles as a daily vehicle are more likely than respondents who use cars as a daily vehicle to take risks by traveling 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.

**Table IV. Mean data between demographic factor Frequently used vehicle to risk taking behavior**

| Item | Frequently used vehicle | | P P<0.05 |
|---|---|---|---|
| | **Motorcycle** | **Car** | |
| RTB6 | 0.58 | 0.29 | 0.024* |
| RTB12 | 0.3 | 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 behaviors RTB1, RTB4, and RTB10 as shown in Table V. 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 on 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.

**Table V. Mean data between demographic factor Accident involvement to risk taking behavior**

| 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* |

## DISCUSSION

The relevance of data to risky behaviors for gender matters shows that the male are more likely to display risky behavior while driving compared to the female where it 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). Next, the relevance of the data to risky behaviors for age matters shows respondents between the age of 46 to 55 years old are more likely to take risks compared to other age categories which is in parallel with an article by (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 maneuvers or losing control of their vehicles. Instead, the data shows that the experience of driving or riding a motorcycle plays an important role where those who have 4 years or more experience in driving or riding are on average are more likely to take risks. Furthermore, data shows that respondents who use motorcycles as a daily vehicle are more likely to take risks by traveling at peak hours compared to respondents who use cars as a daily vehicle which is similar to a study conducted by (8) where it is stated that motorcyclists are more likely to take risks compared to those who drive cars. Lastly, the data shows that involvement in accidents plays a role in risky behaviors where 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. This matches with couple of previous studies where 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).

## CONCLUSION

Based on the data obtained from this study, it clearly shows 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 organization to identify the group of population that prone to this type of behaviour in order to reduce the amount of road accident occurring or for 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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## REFERENCES

1. Hongsranagon, P., Khompratya, T., Hongpukdee, S., Havanond, P., Deelertyuenyong, N. Traffic Risk Behavior and Perceptions of Thai Motorcyclists: A Case Study. Iatss Res. 2011;35(1):30–33. DOI:10.1016/j.iatssr.2011.03.001
2. Dapilah, F., Guba, B.Y., Owusu-Sekyere, E. Motorcyclist Characteristics and Traffic Behaviour in Urban Northern Ghana: Implications for Road Traffic Accidents. J. Transp. Health. 2016; https://doi.org/10.1016/j.jth.2016.03.001.
3. Borhan, M. N., Hakimi, A. N., Aziz, A. & Razuhanfi, M. The Relationship Between The Demographic, Personal, and Social Factors of Malaysian Motorcyclists and Risk Taking Behavior at Signalized Intersections. Accident Analysis and Prevention 121 2018; hlm. 94– 100. DOI: 10.1016/j.aap.2018.09.004
4. Polders, E., Daniels, S., Hermans, E., Brijs, T. &

Wets, G. Crash Patterns at Signalized Intersections. Transp. Res. Rec.: J. Transp. Res. Board 2015; 2514. hlm. 105– 116. https://doi.org/10.3141/2514-12

5. Amadi,G.N., Ahamefule, Ogadimma, M., & Tunde, O. T. Influence of Personality and Demographic Factor on Aggressive Behaviour Among Secondary School Adolescents. British Journal of Psychology Research 2015; 3(1):1-6.
6. Lee-Baggley, D., Preece, M. & DeLongis, A. Coping With Interpersonal Stress: Role of Big Five Personality Traits, 2005. DOI:10.1111/j.1467-6494.2005.00345.x
7. Malaysian Institute of Road Safety Research (MIROS). A Case Study on Risk- taking Behaviours Among Motorcyclists in Klang Valley, Malaysia, Research Report MRR07/. MIROS: Kuala Lumpur, 2012.
8. Cordellieri, P., Baralla, F., Ferlazzo, F., Sgalla, R., Piccardi, L., & Giannini, A.M. Gender Effects in Young Road Users on Road Safety Attitudes, Behaviors and Risk Perception. Frontiers in Psychology 2016; 7:1412. https://doi.org/10.3389/fpsyg.2016.01412
9. Karthaus, M & Falkenstein, M. Functional Changes and Driving Performance in Older Drivers: Assessment and Interventions. Multidisciplinary Digital Publishing Institute (MDPI) Geriatrics 2016 Jun; 1(2):12. doi: 10.3390/geriatrics1020012
10. Cheng, A.S.K., Ng, T.C.K.,& Lee, H.C. Impulsive Personality and Risk-taking Behavior in Motorcycle Traffic Offenders: A Matched Controlled Study. Pers. Individ. Dif. 2012; 53: 597–602.DOI 10.1016/j.paid.2012.05.007