

**A STUDY ON THE
INTERACTION OF MOTORCYCLISTS
AND OTHER ROAD USERS ON ROADWAYS**


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STATEMENT

I declare that this thesis entitled "A Study on The Interaction Between Motorcyclists and Other Road Users on Roadways" is the result of my own research. It has not been accepted for any degree and is not concurrently submitted in candidature of any degree.

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Date : June 15, 1995.

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In the name of Allah, Most Gracious, Most Merciful. Praise be to Allah The Cherisher and Sustainer of the Worlds: Most Gracious, Most Merciful; Master of the Day of Judgment. Thee do we worship, And Thine aid we seek. Show us the Straight way, The way of those whom Thou has bestowed Thy Grace, Those whose (portion) Is not wrath And who go not astray.

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ABSTRACT

Although much effort has been devoted to the study of road accidents in Malaysia, it is only until recently little attention had been given to the accidents involving motorcyclists. Motorcyclists and pillion passengers who are involved in an accident may suffer a serious risk of sustaining severe injury. This study, therefore, was designed particularly to determine the interaction between motorcyclists and other road users as well as to observe the behavior of motorcyclists while riding. Spot speed data, traffic volume and types of faults made by motorcyclists were gathered simultaneously during three different traffic conditions at three locations which have been selected as the case study. The motorcyclists observed were chosen at random and were probably not aware that they were being watched. The results from the study indicates that traffic condition and roadways, in general, did not influence the behavior of the motorcyclists. In general, at least 83 - 97 per cent of the motorcyclists are accident prone due to careless riding. The most common faults made, at all locations, were associated with headlight 'off', safety gap, positioning and lane swap. In terms of speed selection, there are as high as 50 per cent of motorcyclists fail to ride at safe speed limit imposed on a particular road especially during off-peak hour. Immediate safety measures need to be taken to rectify this situation. Motorcycle lane should be provided along the roadways where large number of motorcycles passing through. Motorcyclists should also make themselves 'visible' and learn proper riding techniques before operating the machines.

ABSTRAK

Kajian mengenai kemalangan jalanraya telah banyak dijalankan di negara ini. Walau bagaimanapun, kajian terperinci mengenai kemalangan yang membabitkan penunggang motosikal masih belum diberi tumpuan yang sewajarnya. Penunggang serta pembonceng motosikal yang terlibat dengan kemalangan biasanya mengalami kecederaan yang teruk. Kajian ini dijalankan bertujuan untuk melihat bagaimana penunggang motosikal berinteraksi dengan lain-lain pengguna jalanraya dan memerhatikan tingkahlaku mereka semasa menunggang. Data mengenai kelajuan setempat, bilangan trafik dan jenis-jenis kesalahan yang dilakukan oleh penunggang motosikal telah diambil serentak. Data ini telah diambil pada tiga keadaan trafik yang berbeza dan di setiap tiga tempat yang telah dipilih sebagai kajian kes. Penunggang motosikal telah dipilih secara rawak dalam keadaan mereka tidak menyedari bahawa mereka diperhatikan. Hasil kajian telah menunjukkan keadaan trafik dan jalan secara amnya tidak mempengaruhi tingkahlaku penunggang motosikal. Secara keseluruhannya, sekurang-kurangnya 83% hingga 97% daripada penunggang motosikal adalah terdedah kepada kemalangan akibat daripada kecuaiannya. Kesalahan yang biasa dilakukan termasuklah tidak memasang lampu, mengabaikan jarak keselamatan, kedudukan motosikal yang salah dan mencelah-celah. Terdapat sehingga 50% daripada penunggang gagal untuk mematuhi had laju yang ditetapkan terutama diluar waktu puncak (sibuk). Langkah-langkah keselamatan perlu dilakukan untuk mengatasi masalah ini seperti menyediakan lorong khas motosikal, menjadikan penunggang motosikal 'lebih kelihatan' dan memastikan semua penunggang mempelajari teknik menunggang dengan betul.

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CHAPTER 1

INTRODUCTION

There has been a great concern of road accidents in this country recently. As more new vehicles are being registered yearly, it is only natural that this will result in a proportionate increase in accidents and fatalities unless drastic measures are taken especially in the form of preventive programs.

According to Traffic Police Department statement; one accident is reported on Malaysian roads in every eleven minutes and one person dies in every one hundred fifty minutes.

The number of road accidents increased from 220,939 cases in 1993 to 246,597 cases in 1994. Among the motorists, car represents the highest number of accidents followed by motorcycles. The number of cars involved in accidents have increased from 112,574 in 1993 to 123,479 in 1994 while motorcycles, from 48,511 in 1993 to 58,007 in 1994. (Traffic Police Department, 1995)

Even though cars made up the highest number of accidents, but the highest number of casualties is from the motorcyclists. Formulation of various factors and causes of high casualty rate involving motorcyclists have been attempted by

many relevant scholars. Factors such as speed, lane swap, ignorance of safety gap and failure to give signal prior to the motorcyclists' action have yet to be statistically justified. Most of the time the motorcyclists are blamed for causing the accidents. This is largely attributed to the riding behavior of the motorcyclists.

Accident statistics for the period from 1986 to June 1988 indicated that about 96 per cent of all road accidents were caused by human errors or attitude of road users. Therefore, the purpose of this study is to identify the behavior of motorcyclists while riding and the interaction with other road users. The result may possibly be used to explain the reasons for the high number of accidents involving motorcycles in Malaysia which allows appropriate actions. Safety measures have to be taken for rectification. Such measures will not only save valuable lives, eliminate sufferings and bereavement, but also reduce the economic losses in terms of damages to property and insurance claims, medical fees, etc.

1.1 Study Background

Motorcyclist is one of the vulnerable groups of road users and have by far the worst accident risk compared to other types of motor vehicle. When a motorcyclist is involved in an accident, his chances of being injured or killed are greater than if he is riding in a vehicle affording more protection. They are at least twenty times more likely to be killed or injured per kilometer traveled than car drivers. (Broughton, 1988)

The vulnerability of motorcyclists was supported by the result of the study carried out by Faculty of Engineering, Universiti Pertanian Malaysia. They found that the possibility of motorcyclists to involve in accident was 17 times greater than other types of vehicle. (*Utusan Malaysia, 27 Jun 1994*)

This research was initiated to identify the various characteristics of motorcyclists behavior while riding. Johor Bahru has been selected as a case study, based on the fact that the State of Johor ranks the highest in the number of registered motorcycles in this country. There were 2,837,741 registered motorcycles in Malaysia in 1989 and out of this, 469,101 (16.53 per cent) motorcycles have been registered in the State of Johor. In 1990 alone, a total of 498,310 (16.41 per cent) motorcycles have been registered in this state out of 3,035,930 for the whole country, as illustrated in Appendix A.

The current accident phenomena generates the necessary to address the relationships between accidents and everyday riding behavior particularly for formulation of preventive safety measures. Even though information on the behavior of motorcyclists and the errors made while riding their motorcycles during riding test is available at Road Transport Department, detailed study need to be carried out since the behavior of motorcyclists when riding under test conditions may not be typical as their behavior when riding normally.

This study concentrates particularly on the riding behavior of motorcyclists (from traffic planning and engineering point of view) to observe the interaction between the motorcyclists and other road users.

1.2 Research Questions

Since motorcyclists are associated with the high rate of accidents in this country, the study is designed to find out the reasons for this phenomena. The manner in which motorcyclists behave have also been a cause of complaint by other road users. In response to this, the study hoped to find out the answers for the following questions:

- a) How the motorcyclists interact or share the road space with other vehicles?
- b) What are the common errors made by the motorcyclists?
- c) How motorcyclists behave while riding?
- d) What are the weaknesses of the present road design particularly at the selected roadways?
- e) How do other motorists adapt their method of driving with the presence of motorcyclists in the traffic stream?

1.3 Research Objectives

Generally, the objective of this study is to identify the reasons for the high rate of accidents involving motorcycles in this country. Thus, the findings can be adopted to help reduce the road accidents particularly those involving motorcycles. In more specific the aims of the study are:

- a) To study the interaction between the motorcyclists and other road users. This interaction need to be studied due to the fact that collision with another motor vehicle is the predominant type of motorcycle accident.

Motorcyclists are also thought as 'invisible' and normally not treated as part of the road users by other motorists. Therefore, it is hoped that the result from the study will show the reality of the situation.

- b) To observe the typical riding behavior of motorcyclists under peak hour conditions as well as during off-peak hour conditions in circumstances where they will not be aware that they are being watched. The findings of the study can be used by Road Transport Department to highlight the importance of formal training before issuing license to the motorcyclists. Furthermore, the observed aspect should be considered in the formal training.
- c) To quantify the common errors made by motorcyclists on particular roadways that have been selected as a case study. This is done in order to determine whether the particular stretch of road is the cause that leads to the errors made by motorcyclists.
- d) It is hoped that by carrying out this study it will be possible to a certain extent, to identify the reasons for the high rate of accidents occurring in the city that involved motorcycles. Moreover, effective measures are hoped to be highlighted in recommendation to improve the situation.

1.4 Hypothesis

The study is conducted based on the following assumptions:

- a) Information on the riding behavior of motorcyclists and the factors that influence their actions are very important in road transport industry

especially for the relevant parties such as Road Safety Council, Road Transport Department and Police Department who are responsible in setting up strategies for road safety policy as well as in planning for better transportation system in future. Therefore, if the important information such as the common errors made by the motorcyclists can be gathered, more effective measures may be planned.

- b) Effective measures can help reduce road accidents. However, reliable data and a detailed study are required to ensure that the measures set up really meet and correlates with the basic aim of the parties such as Road Safety Council and the Police Department. The aims of these measures are to reduce accidents rate and plan for better road transport system for the future. It is also assumed that providing special lane for motorcyclists can help reduce accidents involving motorcycles.

1.5 Scope of The Study

The study only concentrates on the riding behavior and the interaction of motorcyclists and other road users on roadways.

The observations has been carried out during peak hour conditions, i.e. 7.00 a.m. to 9.00 a.m. in the morning and 4.00 p.m. to 6.00 p.m. in the afternoon however, only one hour data were collected to represent each condition. The observations were also carried out during off-peak period in order to determine whether the difference in traffic stream will influence the behavior of motorcyclists. All observations have been carried out during weekdays to get

the data during normal traffic stream even though the number of accidents normally increased during holidays, festival seasons and weekends.

Five locations have been categorized as the accident black spot around Johor Bahru. The locations are:

- Jalan Tebrau (Pandan, Majidi)
- Jalan Tun Razak (susur 6 & 5)
- Jalan Skudai
- Jalan Tampoi
- Jalan Datin Halimah

However, for the purpose of this study only three locations were selected due to the limitation of time, energy, equipment and financial. The routes selected were as follows:

- Jalan Tampoi
- Jalan Skudai
- Jalan Datin Halimah

Three aspects of traffic characteristics were addressed in this study i.e.

- Spot speed distributions
- Traffic volume
- Types of faults made by motorcyclists

A description of the categories of behavior listed in form as shown in Appendix B are as follows:

- a) Rear Observation - This category of behavior is associated with the failure to look over shoulder to check for following traffic before making any

maneuver. A look may be too late, or involve too little head movement for the motorcyclist to see properly what is behind him.

- b) Signal- The signal may not be turned on or may be given too late or may be not visible to other motorist, or may be given wrongly by the motorcyclists. (Appendix C)
- c) Lane swap - Moving from one lane of traffic to another without signaling to gain advantage in slow moving traffic streams - often involves 'cutting in' on other vehicles.
- d) Position - The position of motorcycle in the traffic stream such as 'sandwich' position which means that a motorcyclist tries to be in between other vehicles. If there are two lanes of roadways but three vehicles including motorcycle appear at the same time it is also considered as an error.
- e) Safety gap - Riding too close to the vehicle ahead, or passing too close when overtaking moving or stationary vehicles.
- f) Helmet - Motorcyclists are required to wear helmets while riding their motorcycles. (Appendix D)
- g) Headlight - In most cases, automobile drivers claim they do not see motorcyclist in time to avoid an accident. Therefore, in order to increase visibility, it is required by the law that motorcyclists should switch on the headlight when riding.

Since the study only concentrated on the traffic planning and engineering aspects, sociological aspects were not considered. That means questionnaires

would not be distributed and interview would not be carried out to the motorcyclists. This study tried as much as possible to look on the nature of this problem. Therefore, the opinion from the motorcyclists was not taken into account.

Detail information on the number of accidents involving motorcycles particularly in Johor Bahru were gathered from 24-hour accident record released by Traffic Police Department, Johor Bahru.

The common offenses made by the motorcyclists form valuable information that contributed in justifying the causes of high accident rates involving motorcycles. This type of information was released by Road Transport Department, Johor Bahru.

1.6 Importance of The Research

Basically, result of the findings is the most important part of the study. There are certain targets that are aimed to be achieved at the end of this study:

- a) Publication of articles to give information on the importance of road safety awareness among the road users. These articles can be published in the relevant journals or magazines.
- b) The publishing of technical report regarding the road accidents which is specifically addressed to the motorcyclists. This report will also determine the cause of accidents and suggest the measures to solve the problem.

In another aspect, the findings from the result indirectly can have the economic implication through the recommendation of more effective road safety

measures which will help reduce accident rate. In addition, from the academic point of view, findings from this study can be used as additional literature and references for students, engineers and planners from highway and traffic engineering department.

Other groups that may directly or indirectly benefit from the research findings are:

- **Road Transport Department**

The findings can be used in evaluating the method of issuing the driving license. Therefore, the existing method may be revised in future where further research is expected to be carried out.

- **Road Safety Council**

The findings can be used as a basic guideline in setting up the road safety strategy and policy.

- **The public in general and the motorcyclists in particular, are those who will benefit from this research by educating them on how to behave on road and giving them awareness about the errors that often lead to accidents.**

1.7 Conclusion

The accident rate in Malaysia is very alarming and becoming a major issue in this country. Accidents involving motorcycles are worrying and most of the time motorcyclists are blamed for the cause of accidents. They are also said to have acted dangerously while riding.

This study which was carried out in accident prone areas around Johor Bahru, has tried to identify the reasons for this phenomena. Within a short period of time available and with limited budget the study hoped to be able to recommend some measures that help reduce accidents particularly those involving motorcycles.

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