# RTCEBE

# Driver Behaviour Intention to Speeding at School Zone Based on Theory of Planned Behaviour

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**Abstract**: Road safety is an important issue that should be emphasized especially when in the school district as it has a high risk of being involved in serious injuries and fatalities during public conflicts in school and car drivers. This study analyzes the relationship between the variables of the Theory of Planned Behavior (TPB) and the tendency of car drivers to speed in school zone. A total of 200 questionnaires were distributed randomly to respondents in the study area and observations are conducted to collect were on driver characteristics in the school district at Batu Pahat area but due to pandemic of Covid-19 the observation was conduct by analyse the respondent data given via Online (Google form). The questionnaire consisted of three sections and is based on the TPB model and data was analysed using descriptive, correlation, and regression analysis. From the observation carried out, the majority of drivers who comply with the speed limit drive have any conflicts with other road users, but there are a few near-miss accidents observed involving people under 30 years of age. Beside, data analysis shows that the perceived behavioural control was influence the intention of driver to speed at school zone. Finally, some recommendation suggested to reduce the speeding intention at school zone such as add humps in school areas.

**Keywords**: Drivers, School zone, Speeding, Theory of Planned Behavior

## 1. Introduction

Child pedestrian traffic injuries are also on the rise worldwide. It is considered a major safety issue around the world. In Malaysia, Royal Malaysia Police (RMP) showed that in 2013, out of 455 pedestrian fatalities, 65 of them were child pedestrians. Among other areas, most of the children's pedestrian accidents happened in school zones. In 2013, 399 crashes occurred in school zones around

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Malaysia with a total of 243 school children aged 6 to 20 years are injured and 60 children died in the road crashes in the this areas. While, previous study have tended to focus on child behaviour, epidemiology of the child pedestrian crashes, and more upon engineering aspects of school zone areas, such as the built environment of a school zone [1], seldom do researchers examine psychosocial factors that affect road user actions other than child activity in school areas , specifically motorcyclists and drivers.

## 1.1 School Zone Speed Limit

The 15th percentile and 85th percentile speeds are widely used as a cut-off point for traffic speed limits. The 15th percentile and 85th percentile of the over served speed distribution are the most common approach used to calculate the operating speed which in turn is used as a guide to set the speed limit. In situations where 85th percentile speed is too high for the prevailing conditions, engineering techniques or traffic calming measure could be used to lower vehicle speeds [2]. School areas have high levels of pedestrian activity that are particularly vulnerable in the event of a crash. In many cases, child pedestrian crashes are often the result of child behaviour, the road environments and driver behaviour [1]. However, current evidence suggested that, somewhat surprisingly, non-compliance with the school zone speed limit (SZSL) is a dominant behaviour among vehicle user [3]. This finding cause concern as evidence suggests that a driver who drives more than 25km/hr is more likely to cause severe injury to a pedestrian especially child [4]. Furthermore, young child pedestrians are known to have a lack of skills in dealing with traffic situations compared with the older children and adult pedestrians [5]. Consequently, they may act unsafely when using the road as a pedestrian.

## 1.2 Situational Factors

Behaviour itself is a dynamic analysis construct. In accordance to Forward [6], the level of behaviour control may well be affected by both external and internal factors. Internal factors relate to the individual's attitude and temperament, whereas external factors relate to the capacity of other people or circumstances to affect power, such as time, motivation, reliance on other people's cooperation, etc., which contributes to behavioural purpose and actual behaviour. Further, in study by Forward [6] indicated that driver belief they are safer driver if they followed the flow of the traffic. With concern of pedestrian, previous studies have found that the presence of pedestrian affects the driver speed choice when approaching zebra crossing [7]. A study by N. Hidayati [8] on the speed behaviour on school zone concluded that the implementation of safety management scheme at school zone is neglected by the road users. In fact, people are unable to reach the speed limit, combined with a lack of public knowledge, which is the explanation for the failure of implementation.

## 1.3 Theory of Planned Behaviour (TPB)

Explaining human volitional behaviour is a challenging task due to its ambiguity, since the action is not defined. The theory of planned behaviour (TPB) [9] is the most influence and useful model in predicting the social intentional behaviours [10]. Many problems and issues regarding to the societies behaviour have been analyse using theory of planned behaviour as it is widely cited by the researchers [11].

## 2. Materials and Methods

The study focuses on the driver behavior intention to speed at school zone based on the Theory of Planned Behaviour (TPB).

## 2.1 Materials

This study uses a questionnaire as a research tool to collect data. The survey form used was designed and formed based on TPB components. This questionnaire has been divided into 3 parts. Likert scale was used for respondents to answer the survey questions. Scale 1 to 5 is a measurement scale for respondents to the questions posed. The format, wording and structure of the questions in the questionnaire should be considered before the questionnaire is distributed to ensure the reliability and sustained engagement of the respondents [12]. Part of the questionnaire are following as:

• Part 1: Demographic information
• Part 2: Respondent's experience
• Part 3: Respondent's opinion of quality safety at school area

## 2.2 Methods

Before the questionnaire was distributed randomly to the respondents, the validity, reliability and acceptability of the question in the questionnaire should be measured and checked before the questionnaire is distributed at random to the respondents. Pilot research also named in preparation for full-scale analysis as feasibility studies in small-scale version. The pilot study will allow the researchers to recognize the questionnaires' weakness and can remove questions that are misleading to the study target. For this pilot study the coefficients of Cronbach's Alpha were used to determine the internal accuracy of the queries. The alpha coefficients can be 0-1. The alpha coefficients that exceed 0.7 considered acceptable [13].

There were samples of 30 questionnaires distributed through google form to the respondents for performing pilot test. Any ambiguities from the questionnaires asked by the respondents jotted down for the purpose being redesigned. The questionnaires improvised to make it clearer and easier for the respondents to understand. From the questionnaires answered by 30 respondents, the data analysed and the result for the items in Section A and B obtained. The Alpha Cronbach coefficient for Section B is 0.920 and is considered good internal consistency. For Section C, the Alpha Cronbach coefficient is 0.830, considered acceptable. All the items in Section B and C are suitable for this study. Next, the actual study was done by distributing 200 questionnaires in the study area.

## 2.3 Equations

Below is the equation used to determine the relationship between TPB components:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \qquad Eq. 1$$

Where;

| | |
|---|---|
| $Y$ | = Dependent variable (Intention and Behaviour) |
| $X_1, X_2 \dots X_n$ | = Independent variable (Attitude, Subjective Norm, Perceived Behavioural Control) |
| $\beta_0, \beta_1, \beta_2 \dots \beta_n$ | = coefficients or regression of independent variables in the study |

## 3. Results and Discussion

### 3.1 Descriptive Analysis

Based on the study data obtained through 200 respondents, 65.5 % of the respondent were female and another 34.5% of the respondent were male. The highest average age of respondents is between 21 to 25 years with 49.5% (99 respondents) compared to other ages. As for the level of education, it is 50.5%, which is 101 respondents with Degree holders and followed by diploma holders of 50

respondents (25%). The results of the study also show 49.5% (99 respondents) are student category is a higher percentage, 19.5% (39 respondents) are government sector, and 17.5% (35 respondent) are in private sector. More than half of the respondents are from other district that is, 127 respondents (63.5%) and only 36% (73 respondents) are from Johor district. About 57.5% of respondents have a car and 42% of respondents don't have their own car. The highest license type is D license with 78.5% (157 respondents) compare to P license with 10.5% (21 respondents). About 22 respondents are no license which gave a percentage of 11.0%. The highest driving experience is 2-5 years with 34% (68 respondents).

**Table 1: Respondent demographic**

| Item | Frequency (n) | Percentage (%) |
|---|---|---|
| **Gender** | | |
| Male | 69 | 34.5 |
| Female | 131 | 65.5 |
| **Age** | | |
| 20 years old and below | 28 | 14 |
| 21-25 years old | 99 | 49.5 |
| 26-30 years old | 15 | 7.5 |
| 31 to 40 years old | 25 | 12.5 |
| 41 years old and above | 33 | 16.5 |
| **Education Level** | | |
| Primary School | 1 | 0.5 |
| Secondary School | 19 | 9.5 |
| STPM/Sijil/Diploma | 50 | 25 |
| Degree | 101 | 50.5 |
| Master/PHD | 29 | 14.5 |
| **Occupation** | | |
| Government | 39 | 19.5 |
| Private | 35 | 17.5 |
| Self-Employed | 11 | 5.5 |
| Student | 99 | 49.5 |
| Unemployed | 16 | 8.0 |
| **Living Place** | | |
| Johor District | 73 | 36.5 |
| Others District | 127 | 63.5 |
| **Car Status** | | |
| Yes | 115 | 57.5 |
| No | 85 | 42.5 |
| **License Type** | | |
| D | 157 | 78.5 |
| P | 21 | 10.5 |
| No License | 22 | 11.0 |

Demographic Analysis shows that the percentage of female respondents is higher than that of male respondents and students are the majority of respondents. Students can be made up of primary, secondary, college and university students.

Table 2 shows driving experience period below 2 years and 6-10years which are 29.5% (59 respondents) and 23.5% (47 respondents). The least driving experience is 10 years and above with 26 respondents that gave percentage of 13%. Based on data collection total 65.5% (131 respondents)

have experience or almost experience accidents during driving. Besides, there are 75 respondents never have experience or almost experience accidents during driving that gave percentage of 34.5%.. Next, 1.5% (3 respondents) never heard/ seen news of road accidents caused by driver. Meanwhile most of the respondents have heard/ seen news of road accidents caused by driver by 98.5% (197 respondents).

**Table 2: Respondent experience**

| Item | Frequency (n) | Percentage (%) |
|---|---|---|
| **Driving Experience Period** | | |
| Below 2 Years | 59 | 29.5 |
| 2-5 Years | 68 | 34.0 |
| 6-10 Years | 47 | 23.5 |
| 10 Years and above | 26 | 13.0 |
| **Accidents while Driving** | | |
| Yes | 131 | 65.5 |
| No | 69 | 34.5 |
| **Heard/ Seen News of Road Accidents cause by Driver** | | |
| Yes | 97 | 98.5 |
| No | 3 | 1.5 |

Based on the respondent's experience, most of the respondents have involved or almost involved in any accidents while driving. The school zone safety provided in Batu Pahat areas are not below the standard of satisfaction of the driver that driving at school area.

Figure 1 shows the whole relationship of Theory of Planned Behaviour. Percieved Behavioral Control influence the behavior of driver to speeding at school zone.
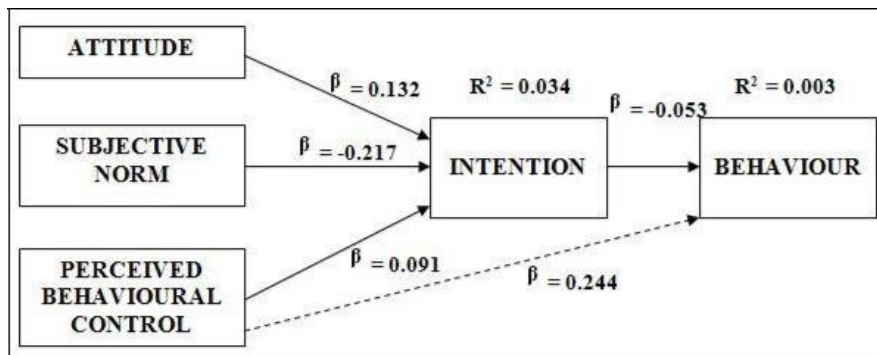


**Figure 1: Structural model of tpb for driver behaviour intention to speed at school zone based on theory of planned behaviour**

Previous study by Patrick De Pelsmacker [14] shows the impact of PBC will probably be more important if the behavior is not 'new', but based on experience. driver's speed selection behaviors are related to perceived control and intention towards the use of advanced vehicle safety systems.

## 4. Conclusion

Most of the drivers who comply with the speed limit drive with any conflicts with other road user, but there are a few near miss accidents observed involving the people age below 30 years old. From

the analysis, the factor that influenced driver to perform behaviour (Intention) is Perceived Behavioural Control (PBC). The Intention gives impact and factor towards observable response by the individual (Behaviour). In conclusion, the entire objectives of the study are achieved and discussed in previous chapter. The findings from this study may be used for further study and the appropriate steps should be taken by any of the relevant parties to improve the deficiencies identified regarding the speeding behaviour in this study.

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