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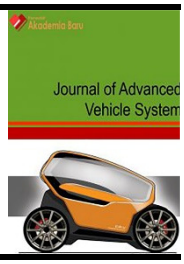

A study on Malaysian long-haul bus drivers' inappropriate driving behaviours and attitude towards traffic safety

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ABSTRACT

This study attempts to determine long-haul bus drivers' attitudes towards traffic safety and inappropriate driving behaviours (IDBs) while ferrying passengers. Using a quantitative method, a total of 184 long-haul bus drivers were involved in the survey. The findings reveal that there was a relatively positive relationship between long-haul bus drivers' IDBs and attitude towards traffic safety. However, the relationship was weak as other factors that were excluded might have a contribution to it. Bus drivers' experience of being ticketed has been shown to have significant influence on inappropriate behaviours and attitude towards safety. However, for experience of road accidents, significant difference was only seen in inappropriate behaviours and was not evidenced in attitude towards safety.

1. Introduction

The government of Malaysia is determined to improve the country's public transport (PT) services. Its long-term target is to achieve 40% PT modal share in urban areas by 2030 [1]. Therefore, various developments in PT services are taking place such as introduction of Bus Rapid Transit (BRT), integrated terminals including the one in Bandar Tasik Selatan (TBS), and the development of Klang Valley Mass Rapid Transit (KVMRT) [2,3]. Nevertheless, public bus service remains as the most popular choice among commuters by virtue of having cheaper fare and better network coverage compared to rail and air travel.

The types and features of bus operations in Malaysia are designed according to various needs and functions. There are seven types of bus classes, namely 'express' bus (referring to long-haul bus

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services), stage bus, charter bus, mini bus, feeder bus, worker bus and school bus. Long-haul or express bus services are preferred for personal reasons as well as for '*balik kampung*' exodus particularly during Eid and Chinese New Year public holidays [4]. Though their operational safety during wee hours was once hotly debated, long-haul buses in Malaysia are basically available on a 24-hour basis [5].

The status quo of bus service operational safety in Malaysia especially long-haul buses can be explained in two ways. First, the number of bus-related casualties is not as high as road traffic casualties among motorcycle and car users, as well as pedestrians [6]; and secondly, bus services need improvements to become as attractive as possible in order to garner and maintain public confidence especially in matters relating to road accidents [7,8]. The latter is a rather complex issue since bus-related accidents will easily turn into media frenzy. In fact, major road accidents in Malaysia have often involved long-haul buses which include the 'Genting Highland' case (with an all-time record high of 37 fatalities; bus in a Single Vehicle Accident (SVA) in 2013), the 'Simpang Pulai' case (28 fatalities; bus in SVA in 2010), and the 'Bukit Gantang' case (22 fatalities; bus in SVA in 2007) – identified according to the accident locations [9].

In Malaysia, the recent increase to the number of bus-related road traffic accidents can be associated with bus drivers' behaviours and attitudes. Many reports mention that attitude has been identified to directly and indirectly cause road traffic accidents, even in developed countries [10-12]. Attitude through its influence on the formation of intention, has been theoretically and empirically linked to behaviour outcomes [13,14]. For example, a Belgian study revealed an affectively positive attitude towards speed limits has a positive impact on self-reported behaviour. Moreover, attitude appears to have both a cognitive and an affective component, in which each plays a role in the formation of behavioural intention [15].

Previous studies perceived attitudes as learned predispositions to respond to a specific target, in either a positive or negative manner [16,17]. Attitudes are assumed to provide a means of understanding behaviour [18], and the behavioural component is related to expressions of behavioural intention or action [19]. Due to stressors that exist in a bus driver's work environment such as heavy traffic conditions, inflexible time schedules, interaction with passengers and crowdedness etc., both cognitive and physical workloads dramatically increase [20]. In order to reduce the impact of these stressors, apart from organisational improvements, workspace of the bus driver must be properly designed [21].

Moreover, the relationship between attitude and behaviour has been considerably debated. A meta-analysis by Kraus showed that attitudes can generally predict self-reported behaviour [22]. This is also true in the area of road safety, where some studies have identified a relationship between attitudes and self-reported driving behaviour [10,14,23,24]. A study conducted by Asiamah et al. showed that a majority of bus drivers expressed understanding of drunk driving as being a significant risk factor for accidents even though drinking alcohol before working has been their general practice [25]. They unanimously stated that drinking contributed to relaxation, release their inhibitions, and increase their confidence on the road. It also helped them to socialise and they enjoyed the taste. However, they reported more problems associated with alcohol with key words such as "hangovers", "addiction", "accidents", and "deaths".

Another study conducted by Ma et al. stated that risk-taking attitudes were found to have significant effects on inappropriate driving behaviour [26]. Results indicated that drivers lacking concern about traffic risks and with a positive attitude towards rule violation and speeding tend to be more prone to road crashes. In a survey involving Norwegian drivers on attitude towards traffic safety, an ideal attitude is an attitude contributing to safe behaviour. The results revealed that

despite positive attitudes toward traffic safety issues, there were potentials for improvement, especially related to rules and speeding violations [11].

In Malaysia's context, a study was conducted by Mohd Rasid et al. to evaluate the Safety, Health and Environment Code of Practice (SHE COP) of a bus company practising one-driver trips [27]. The study revealed that 46% of the company's buses were driven beyond the permissible speed on the highway – all the recorded maximum speeds exceeded the buses' highway speed limit of 90 km/h. Additionally, the most common inappropriate driving behaviours (IDBs) observed during the study were 'picking and dropping passengers outside of assigned terminals', 'sudden braking', 'overtaking in prohibited areas', 'tailgating', 'use of mobile phone', 'changing lanes without signal', and 'dangerous overtaking'.

Nevertheless, the number of local research with regard to behaviour and attitude among long-haul bus drivers is still low. This eventually leads to little understanding of bus drivers' attitudes and behaviour towards traffic safety in Malaysia. Meanwhile, current intervention programmes specifically focusing on long-haul bus drivers have not utilized psychological principles and often failed to address the specific attitudes that contribute to traffic accidents. As a result, tragic accidents caused by irresponsible drivers and unethical bus operators will recur. In response to this gap, this research which involves long-haul bus drivers as its samples aims to fulfill five main objectives, namely:

i. To determine long-haul bus drivers' inappropriate driving behaviours (IDBs);
ii. To determine long-haul bus drivers' attitudes towards traffic safety;
iii. To determine the relationship between long-haul bus driver's attitudes towards traffic safety and inappropriate driving behaviours (IDBs);
iv. To evaluate the impact of long-haul bus driver's experience in being involved in road accidents and experience of being ticketed on attitude-related traffic violations; and
v. To evaluate the impact of long-haul bus driver's experience in being involved in road accidents and experience of being ticketed on IDBs-related traffic violations.

2. Methodology

This study was based on face-to-face interview surveys carried out at designated main bus terminals. The chosen locations were within the Kuala Lumpur conurbation, or typically referred to as *Klang Valley*. The sites included Klang Sentral, Terminal Bersepadu Selatan (TBS) and Hentian Duta. These terminals were chosen as they are the main starting points for bus service network connecting regions in West Malaysia. Respondents of the study comprised long-haul bus drivers, with their driving license validity checked during the survey. Samples were drawn from long-haul buses making a stop at the terminals by means of purposive sampling. Purposive sampling is a technique in which the study sample is selected based on some appropriate characteristics of the sample members [28]. The study targeted 400 respondents representing the sample size. However, the response rate was only 46%, which means only 184 respondents were successfully interviewed.

The survey considered several items for measuring attitudes towards traffic safety and IDBs. The questionnaire included the following components: (i) demographic information; (ii) driving attitudes; and (iii) IDBs. The demographic part included respondents' age, education, marital status, total driving experience (in years), driving experience in the bus company as a bus driver (years), weekly driving time (hour), annual mileage (kilometre/hour), number of crashes and traffic offences (financial penalties due to violation of traffic rules) in the past three years.

Table 1
Long-haul bus drivers' attributes and driver-related information

Item	n (%)
Gender	
Male	184 (100.0)
Female	0 (0.0)
Age (years old)	
16 – 25	1 (0.5)
26 – 35	42 (22.8)
36 – 45	58 (31.5)
46 – 55	63 (34.2)
56 and above	20 (10.9)
Marital status	
Single	21 (11.4)
Married	160 (87.0)
Divorced	3 (1.6)
Race	
Malay	163 (88.6)
Chinese	2 (1.1)
Indian	19 (10.3)
Others	0 (0.0)
Education level	
No formal education	4 (2.2)
Primary	40 (21.7)
Secondary	132 (71.7)
Tertiary	8 (4.3)
Driving experience (years)	
5 years and below	57 (31.3)
6 - 10	29 (15.9)
11 – 15	17 (9.3)
16 – 20	36 (19.8)
More than 20	43 (623.6)
Estimated working days/schedule	
1 – 3 days	3 (1.7)
4 – 6 days	150 (81.5)
7 – 10 days	31 (16.8)
Estimated hours of driving/day	
8 hours and below	157 (85.3)
9 -16 hours	27 (14.7)
More than 16 hours	0 (0.0)
Experienced of being ticketed	
Yes	50 (27.2)
No	134 (72.8)
Number of tickets received within the previous 3 years on traffic charges when on duty	
5 tickets and below	45 (95.7)
6 tickets and above	2 (4.3)

Next, driver attitudes were measured using the level of agreement associated with 30 road safety issues as well as existing or new impaired driving countermeasures [29]. Respondents were specifically asked by the interviewer: "Tell me whether you agree with each of the following road safety issues using a 5-point scale, with 1 indicating you strongly disagree and 5 indicating you strongly agree". Meanwhile, drivers' behaviour was assessed based on Mohd Rasid et al. (2013) study, as these unsafe or inappropriate behaviours can lead to road accidents [27]. The subscale

consisted of 16 items which were given a score from 1 (never) to 5 (very often) depending on how frequent each respondent had demonstrated such behaviours while on duty.

Statistical Package for Social Sciences (SPSS) version 20.0 was used to analyse the data to correlate the long-haul bus drivers' attitude towards traffic safety and IDBs. Bivariate correlation was applied to test whether there was significant relationship in the attitudes and behaviours measured.

3. Results and discussions

All the 184 respondents were male with an average age of 44 (SD = 9.731), as shown in Table 1. Most of them obtained secondary education (71.7%), followed by 21.7% with primary education while the other respondents had tertiary education. On average, the respondents have had their driver's license for 13.75 years (SD = 9.824). Most of the drivers worked on 4- to 6-day schedule, and drove less than 8 hours a day. A majority of them claimed that they have never been ticketed for traffic offences (72.8%), while most who had committed traffic violations said they received less than 5 tickets in the past three years while at work.

3.1. Long-haul bus drivers' inappropriate driving behaviours

Table 2 shows the categories of IDBs as reported by the long-haul bus drivers interviewed. A majority of them admitted that they had not demonstrated any of the inappropriate behaviours during their weekly duty. However, there were five styles of driving nearing the score of 2 (which means the drivers infrequently displayed certain behaviours). The behaviours included: (i) weaving; (ii) harsh braking; (iii) using a mobile phone; (iv) pick-and-drop passengers outside the designated areas/terminals; and (v) smoking while driving. These unsafe behaviours could lead to road accidents.

Table 2
Inappropriate driving behaviours while on duty on a weekly basis (1 for never to 5 for very often) (n=184)

Driving behaviours	Mean
Weaving	1.71
Harsh braking	1.65
Using hand phone while driving	1.61
Picking/dropping passengers outside assigned terminal	1.59
Smoking while driving	1.53
Overtaking in prohibited areas	1.38
Tailgating	1.29
Sleepy	1.24
Queue jumping	1.17
Changing lanes without signal	1.16
Red-light running	1.11
Overtaking at double line	1.11
Use of emergency lane	1.08
Overtaking dangerously	1.04
Driving under influence alcohol	1.01
Taking nonprescription drugs	1.01

3.2. Long-haul bus drivers' attitudes towards traffic safety

The 30 items measured for drivers' attitudes towards traffic safety were grouped into 6 cluster of violations, namely (1) attitude towards rules violation; (2) attitude towards speeding; (3) attitude towards SHE COP practice; (4) attitude towards driving under influence (DUI); (5) attitude towards

tailgating; and (6) attitude towards overtaking in prohibited areas. The drivers interviewed were required to answer based on their level of agreement from 1 (indicating strongly disagree) to 5 (strongly agree).

Table 3 shows the mean score of the long-haul bus drivers' attitude towards traffic safety. The results suggest that most of their attitudes were positive, which were attitude towards tailgating *(Mean, SD:* 2.09, 0.520*),* attitude towards SHE COP *(Mean, SD:* 2.20, 0.531*),* attitude towards driving under influence (DUI) *(Mean, SD:* 2.25, 0.426*)* and attitude towards rule violation *(Mean, SD:* 2.38, 0.662*).* In contrast, attitude towards overtaking in prohibited areas *(Mean, SD:* 2.51, 0.846*)* and attitude towards speeding *(Mean, SD*: 2.99, 0.735) indicated a negative attitude among the bus drivers.

Descriptive statistics showed that attitude of speeding has the highest mean of agreement (*Mean, SD:* 2.99≈3, *0.735*). This indicates that long-haul bus drivers were more prone to speeding, which is a negative attitude. Such an attitude was reflected in the level of agreement in the following items: "it is acceptable for a long-haul bus driver to drive a little faster than the given speed limit" (50.0%); "when road conditions are good and nobody is around, driving 100 km/h is ok" (71.7%); and "the given speed limit is too low, thus leading to speed limit violations among long-haul bus drivers" (56.5%).

Meanwhile, the lowest mean of agreement was for attitude towards tailgating *(Mean, SD: 2.09, 0.520)*. This illustrated that the overall response to this question was positive. This was shown in the percentage of disagreement to the following items: "it is acceptable for a long-haul bus driver to tailgate another vehicle closely as long as it does not pose danger" (84.8%); "tailgating other vehicles is not a serious offense among long-haul bus drivers" (72.3%); "long-haul bus drivers who are skilled can tailgate other vehicles closely as long as it does not lead to accident" (92.4%); and "long-haul bus drivers who are getting fined by authorities due to tailgating other vehicles are considered unlucky" (64.7%).

Table 3
Long-haul bus drivers' attitude towards traffic safety

No.	Item	Disagree	Agree	Neither
Attitude towards rules violation (Mean, SD: 2.38, 0.662)				
1	Many traffic rules must be ignored to ensure traffic flow	72.9	22.2	4.9
2	Traffic rules must be respected regardless of road and weather conditions	16.9	78.3	4.9
3	It is acceptable to drive when traffic lights shifts from yellow to red	63.6	30.9	5.5
4	Taking chances and breaking a few rules does not necessarily make bad drivers	56.6	35.9	7.6
5	It is acceptable to take chances when no other people are involved	65.3	27.1	7.6
6	Traffic rules are often too complicated to be carried out in practice	61.4	29.4	9.2
Attitude towards speeding (Mean, SD: 2.99, 0.735)				
7	It is acceptable for a long-haul bus driver to drive a little faster than the given speed limit	44.0	50.0	6.0
8	When road conditions are good and nobody is around driving 100 mph is ok	25.6	71.7	2.7
9	Punishments for speeding should be more restrictive	44.0	50.0	6.0
10	Given speed limit is too low, thus leading to violation of the speed limit among long-haul bus drivers	34.2	56.5	9.2
14	It is reasonable to drive faster than the given speed limit	58.7	29.9	11.4

Attitude towards SHE Code practice (Mean, SD: 2.20, 0.531)				
11	It is acceptable if I drive a bus for more than 8 hours a day	56.0	33.1	10.9
12	I have to ensure that I get some rest after driving for 4 hours continuously	7.6	90.2	2.2
13	I have to ensure that there is rotation of drivers during my trips depending on the determined destinations	9.7	87.5	2.7
15	It is not an offence for n long-haul bus driver to use a mobile phone while driving the bus	77.8	22.2	0.0
Attitude towards DUI (Mean, SD: 2.25, 0.426)				
16	I would not drive a bus after taking alcoholic drinks	16.9	82.0	1.1
17	It is acceptable for a long-haul bus driver after taking one or two glasses of alcohol	95.1	3.3	1.6
18	It is acceptable for a long-haul bus driver to take medicinal supplements to increase stamina or to reduce sleepiness	86.4	8.3	5.4
19	Consumption of alcohol while driving is not wrong provided it does not lead to the level of being drunk	96.7	3.3	0.0
20	I am aware of the amount of alcohol I take and stays below the legally approved maximum alcohol level in blood (BAC 80mg)	78.3	9.2	12.5
Attitude towards tailgating (Mean, SD: 2.09, 0.520)				
21	I am aware that tailing a vehicle too close can increase the chances of being involved in an accident	10.3	85.8	3.8
22	It is acceptable for a long-haul bus driver to tailgate another vehicle closely as long as it does not pose danger	84.8	12.0	3.3
23	Tailgating other vehicles is not a serious offense among long-haul bus drivers	72.3	22.8	4.9
24	Long-haul bus drivers who are skilled can tailgate other vehicles closely as along as it does not lead to accident	92.4	4.9	2.7
25	Long-haul bus drivers who are ticketed / fined by authorities due to tailgating other vehicles are considered unlucky	64.7	27.2	8.2
Attitude towards overtaking in prohibited area (Mean, SD: 2.51, 0.846)				
26	It is acceptable for bus drivers to take some risks to overtake in prohibited areas	71.7	19.6	8.7
27	Overtaking in prohibited area is not a serious offence among long-haul bus drivers	64.1	30.4	5.5
28	I am a skilled driver and am aware that it is safe for me to overtake in prohibited area	48.9	39.7	11.4
29	Long-haul bus drivers who are ticketed / fined by authorities due to overtaking in prohibited area are considered unlucky	55.4	38.6	6.0
30	Overtaking in prohibited areas is acceptable as long as it does not endanger other drivers	65.8	27.2	7.0

3.3. Relationship between long-haul bus drivers' attitudes towards traffic safety and IDBs

The assumption of normality was tested for attitudes and behaviour variable via Kalmogorov-Smirnov Test with the result indicating that normality assumptions were violated (*p-value < 0.05*). A Kendall's tau-b correlation was run to determine the relationship between IDBs and attitude towards traffic safety amongst 184 long-haul bus drivers. There was a positive correlation between long-haul bus drivers IDBs and attitude towards traffic safety, which was statistically significant (τb = .240, p = .0001). However, the relationship was relatively weak (Table 4).

Table 4
Correlation table between behavior and attitude

Kendall's tau		Mean behaviour	Mean attitude
Mean behaviour	Correlation coefficient	1.000	.240**
	Sig. (2-tailed)		.0001
	N	184	184
Mean attitude	Correlation coefficient	.240**	1.000
	Sig. (2-tailed)	.0001	
	N	184	184

3.4. Impact of long-haul bus drivers' experience in being involved in road accidents and experience of being ticketed on attitudes towards traffic safety

Since the assumption of normality was violated for related variables, a Mann-Whitney U-test (non-parametric test) was conducted to determine whether there was a difference in the experience of being ticketed in the past 3 years to the drivers' attitudes towards traffic safety. Results of such an analysis indicated that there was a difference, z = -2.313, *p-value* < .05 with long-haul bus drivers who have been ticketed while on duty having more positive attitude towards traffic safety than those who have not (Table 5). As regards involvement in road accidents, there was no significant difference in this type of group, thus indicating that road accidents involvement was not associated with bus drivers' attitudes.

Table 5
Impact of long-haul bus drivers' experience in being involved in road accidents and experience of being ticketed on attitudes towards traffic safety

Mean attitude		N	Mean rank	Mann-Whitney, U	Z	Sig. (2-tailed)
Involved in accidents for the past 3 years (while on duty)	Yes	24	104.28	1580.50	-1.135	0.256
	No	160	90.82			
Have been ticketed for the past 3 years (while on duty)	Yes	51	107.36	2607.00	-2.313	0.021
	No	133	86.96			

3.5. Impact of long-haul bus driver's experience in being involved in road accidents and experience of being ticketed on IDBS-related traffic violations

The Mann-Whitney U-test was repeated to determine whether there was a difference in accident involvement in the past 3 years to the drivers' inappropriate behaviours. Results of the analysis indicated that there was a difference, z = -2.064, p < .05 with long-haul bus drivers involved in accidents while on duty having greater IDBs reported than those who never met with an accident (Table 6). The same results were obtained for those who had been ticketed for traffic violations. They showed that long-haul bus drivers who have been ticketed while on duty have greater IDBs reported than those who never been ticketed.

Table 6
Impact of long-haul bus driver's experience in being involved in road accidents and experience of being ticketed on IDBs-related traffic violations

Inappropriate driving behaviours		N	Mean rank	Mann-Whitney, U	Z	Sig. (2-tailed)
Have been ticketed for the past 3 years (while on duty)	Yes	50	112.99	2325.50	-3.204	0.001
	No	134	84.85			
Involved in accidents for the past 3 years (while on duty)	Yes	24	113.83	1361.00	-2.064	0.039
	No	160	89.45			

4. Conclusion

This study provided evidence of a relatively positive relationship between IDBs and attitude towards traffic safety which is in line with previous research. However, the relationship was weak as several other factors which were excluded might have contributed to the relationship. Long-haul bus drivers' experience of being ticketed has shown significant difference in IDBs and attitude towards traffic safety. However, their accident involvement appears to only have a significant difference in IDBs which means experience of being involved in accidents has no influence on their attitude towards traffic safety.

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