

# The Effect of Accident History and Socio-Economic Groups on Indonesian Motorcycle Rider Behaviour

Leksmono Suryo PUTRANTO <sup>a</sup>, Rostiana ROSTIANA <sup>b</sup>

<sup>a</sup> *Civil Engineering Department, Tarumanagara University, Jakarta, 11440, Indonesia*

<sup>a</sup> *E-mail: ls.putranto@ftuntar-id.com*

<sup>b</sup> *Faculty of Psychology, Tarumanagara University, Jakarta, 11440, Indonesia*

<sup>b</sup> *E-mail: dutaindah03@yahoo.com*

**Abstract:** This paper was based on research using Indonesian motorcycle rider behaviour questionnaires. 604 respondents from three cities (Pangkalpinang, Pontianak, Manado) were interviewed. The instrument consists of 38 statement items within nine factors, i.e. speed violations, safety violations, control errors, traffic errors, stunts, traffic violations, high speed violations, stopping errors/ violations and motorcycle carrying capacity violations. Likert scale was used from 1 (almost never) to 5 (nearly always). Generally the respondents were low risk riders. All of the composite mean values of items within each factors were less than three (a threshold between low and high risk behaviour). Respondents with accident involvement in the previous year were more frequent to conduct speed violations and stunts. Younger respondents were more frequent to conduct speed violations. Unmarried respondents were more frequent to conduct traffic errors, speed violations and stunts. Less wealthy respondents were more frequent to conduct stunts.

*Keywords:* Indonesian, motorcycle rider behaviour, questionnaire, errors, violations, stunts

## 1. INTRODUCTION

In Indonesian cities, there was increasing trend of motorcycle ownership and use to avoid congestion in the last decades. The severe congestion was due to uncontrolled land use development and unsatisfactory public transport system. Large number of motorcycle in the general traffic triggers other problems related to motorcycle rider behaviour such as unskilled rider, traffic violation, aggressive behaviour, etc. Driver behaviour questionnaire has been developed in western countries for a long period as logical consequences for car dominated countries. Such instrument can not directly be used to assess motorcycle rider behaviour. Therefore some research in England (Elliott et al, 2007), Iran (Ali et al, 2011 and Motevalian et al 2011), , Australia (Sakashita et al, 2014) and Turkey (Ozkan et al, 2012) have been done to develop motorcycle rider behaviour questionnaire (MRBQ). Slightly different approach was done In Hong Kong (Cheng and Ng, 2010). They developed specific instrument to measure violation behaviour, i.e. Chinese Motorcycle Rider Driving Violation (CMRDV).

Putranto and Anjaya (2014) propose Indonesian MRBQ. However, the items in this instrument were developed without robust theoretical basis. It was based on adaptation on theory for development of driver behaviour questionnaire, DBQ (Reason et al, 1990) research on effect of external disturbance to car driver and motorcycle rider behaviours (Putranto and Kurniawan, 2013). Elliot et al (2007) stated the difference between DBQ and MRBQ, i.e. in the context of motorcyclists' behaviour, it could be hypothesised that a type of behaviour relating to control of the vehicle is likely to be more important than it is for car driving. This

is because motorcycling is inherently much more demanding on control skills than car driving (Elliot et al, 2007).

Furthermore, MRBQ is sensitive to local customs. Items about protective clothing in England (Elliot et al, 2007) were not relevant in developing countries such as Iran (Motevalian et al, 2011) and Indonesia. In Iran, “carry passengers for money” seems to be illegal (Motevalian et al, 2011), whilst in Indonesia “motorcycle taxi” (called as “ojek” in local term) is a common “public transport” although not formally mentioned in Indonesian Traffic and Land Transport Law No. 22/ 2009. Therefore the needs to develop Indonesian MRBQ is justified. The Indonesian MRBQ (Putranto and Rostiana, 2014a) was used in three cities in Indonesia (Pangkalpinang, Pontianak and Manado). Originally, 38 statement items in Indonesian MRBQ were grouped into six subscales (factors), i.e. speed violations (SV), safety violations (SAV), control errors (CE), traffic errors (TE), stunts (S) and traffic violations (TV) as used in Persian MRBQ (Motevalian et al, 2011). Effects of accident history and socio economic factors to these six factors were reported in Putranto and Rostiana (2014b). However, based on factor analysis conducted by Putranto and Rostiana (2015), nine factors were extracted. This paper is intended to evaluate effects of accident history and socio economic factors to these nine factors.

## 2. LITERATURE REVIEW

There were several driver behaviour questionnaire (DBQ) in some countries. One of them was Manchester DBQ (Lawton et al, 1997). Respondents were asked to rate using Likert scale from 1 (never) to 6 (almost always) their frequency to conduct aggressive, violation, error and lapse behaviours.

Earlier, Furnham and Saipie (1993) developed specific DBQ for driver with no previous involvement in traffic violations. Horwood and Fergusson (2000) in a study on relationship between drink driving and traffic accident within young drivers group in New Zealand used DBQ developed by Reason et al (1991) in England with necessary adjustment for New Zealand condition. Xie and Parker (2002) considered Chinese culture to modify Manchester DBQ. As a result accuracy of Chinese DBQ to predict traffic violations was improved. An example of specific Chinese culture was identifying him/ her self as a colleague of police officers. Cultural factors were also considered by Lajunen et al (2004) when using Manchester DBQ in a research in Netherland and Finland. Sullman et al (2002) found that DBQ for four wheeler drivers can be used for truck drivers in New Zealand.

Reason et al (1990) defined violation as deliberate (though not necessarily reprehensible) deviations from those practices believed necessary to maintain the safe operation of a potentially hazardous system. Reason et al (1990) defined errors as the failure of planned actions to achieve their intended consequence. Errors can involve two psychologically distinct kinds of 'straying': the unwitting deviation of action from intention (*slips* and *lapses*); and the departure of planned actions from some satisfactory path towards a desired goal (*mistakes*).

As mentioned before, motorcycling is inherently much more demanding on control skills than car driving (Elliot et al, 2007). Therefore they developed motorcycle rider behaviour questionnaire (MRBQ). They extracted 43 indicators in five factors, i.e. traffic violations, speed violations, stunts, traffic errors and safety equipments. In Persian MRBQ (Motevalian et al, 2011), the first four factors were the same with MRBQ developed by Elliot et al (2007), i.e. traffic violations, speed violations, stunts and traffic errors. However, safety equipments factor was not in Persian MRBQ as the use of motorcycle rider protective clothings was not common

in Iran. As substitutes, Persian MRBQ added two other factors, i.e. safety violations and traffic violations. In Australian MRBQ (Sakashita et al, 2014), there were four factors, i.e. errors (without distinction between traffic errors and control errors), speed violations, stunts and protective clothings (similar with safety equipments).

Instead of developing Chinese MRBQ Tiongkok, Cheng and Ng (2010) developed CMRDV (Chinese Motorcycle Rider Driving Violation). This questionnaire only consists of two factors, i.e. aggressive violations and ordinary violations.

As stated in the introduction, Putranto and Rostiana (2014a) developed Indonesian MRBQ with 38 item statements. Respondents were asked to rate using Likert scale from 1 (never) to 5 (almost always) their frequency to conduct each item statement. Table 1 list of 38 statement items.

Table 1. MRBQ Statemen Items

Factor	Item No.	Description
TE	1	Fail to notice that pedestrians are crossing when turning into a side street from a main road
	2	Not notice someone stepping out from behind a parked vehicle until it is nearly too late
	3	Pull out on to a main road in front of a vehicle that you had not noticed, or whose speed you have misjudged
	4	Fail to notice or anticipate that another vehicle might pull out in front of you and have difficulty stopping
	5	Queuing to turn left on a main road, you pay such close attention to the main traffic that you nearly hit the vehicle in front
	6	Distracted or pre-occupied, you belatedly realise that the vehicle in front has slowed and you have to brake hard to avoid a collision
	7	Attempt to overtake someone that you had not noticed to be signalling a left turn
	8	When riding at the same speed as other traffic, you find it difficult to stop in time when a traffic light has turned against you
	9	Ride so close to the vehicle in front that it would be difficult to stop in an emergency
	10	Run wide when going round a corner
SV	11	
	12	
	13	
	14	
	15	
	16	
	17	
	18	
	19	

- TE4-
- 
- TE6-
- TE7-
- TE8-
- TE9- ncy
- TE10-
- SV11-Ride so fast into a corner that you feel like you might lose control
- SV12-Exceed the speed limit on a country/rural road
- SV13-Disregard the speed limit late at night or in the early hours of the morning
- SV14-Exceed the speed limit on a motorway
- SV15-Exceed the speed limit on a residential road
- SV16-Race away from traffic lights with the intention of beating the driver/rider next to you
- SV17-Ride between two lanes of fast moving traffic

- SV18-Get involved in unofficial ‘races’ with other riders or drivers
- SV19-Ride so fast into a corner that you scare yourself
- S20-Attempt to do, or actually do, a wheelie
- S21-Intentionally do a wheel spin
- CE22-Find that you have difficulty controlling the bike when riding at speed
- CE23-Skid on a wet road or manhole cover
- CE24-Driver deliberately annoys you or puts you at risk
- SV25-Ride when taking drugs or medications which might have effects on your riding
- TV26-Cross junction when traffic light is red
- TV27-Riding in opposite direction of road way
- TV28-Riding in sidewalk
- TV29-Call with mobile phone while riding
- TV30-Smoking while riding
- SAV31-Using helmet without chin straps or not fastening it.
- CE32-Carry a large carriage with motorcycle
- SAV33-Carry more than one passenger with your motorcycle
- S34-Have a crash with a parked vehicle and make damage to it, but escape from crash scene
- SAV35-Riding with an impaired motorcycle
- SAV36-Riding without helmet
- SAV37-Carry a passenger who have not worn helmet
- CE38-Delay in noticing the car in front of you when opening door suddenly and control your motorcycle difficulty

The instrument was then used to evaluate effects of accident history and socio economic factors to motorcycle rider behaviours in three cities (Pangkal Pianang, Pontianak and Manado). The works reported in Putranto and Rostiana (2014b) were using six factors in Persian MRBQ to group the item statements. Mean of composite factor scores (from item statements within each factor) were calculated to represent each factor. The followings were the summary of the findings:

- The respondents were relatively low risk riders as the mean of composite factor scores were less than three which is a marginal score between safe and risky behaviours.
- Stunts were consistently least frequent behaviours within all groups of respondents with mean of composite factor scores less than 1.4.
- Respondents involve in at least an accident within last one year tend to conduct all factors more frequently compare to respondents with no accident history within last one year.
- Male respondents tend to conduct speed violations and stunts compare to female respondents.
- Younger respondents from young adult age group (18-39 years old) tend to conduct more frequent speed violations compare to respondents from older age group.
- Unmarried respondents tend to conduct more frequent traffic errors, speed violations and stunts compare to married respondents.
- Unexpectedly, wealthier (identified from higher monthly expenditure as a proxy) respondents tend to conduct more frequent stunts compare to less wealthy respondents.

Instead of only six factors as in Persian MRBQ, Putranto and Rostiana (2015) found nine factors as follows:

- SV\*-Speed violations (SV11, SV12, SV15, SV16, SV17, SV19, TE6, TE10)
- SAV\*-Safety violations (SAV31, SAV36, SAV37)
- TE\*-Traffic errors (TE1, TE2, TE3, CE22)
- HSV\*-High speed violations (SV13, SV14)
- S\*-Stunts (S20, S21, SV25)
- CE\*-Control errors (CE23, CE24, CE38)
- SEV\*-Stopping errors/ violations (TE8, TE9, TV26, S34)

- TV\*-Traffic violations (TV27, TV28)
- MCCV\*-Motorcycle carrying capacity violations (CE32, SAV33, SAV35)

It can be seen that some factors were combination of statement items from more than one factor in Persian MRBQ. However these new factor membership were not only statistically justified but also logic. On the other hand there were additional three factors. One of them was high speed violations containing statement items related to speed violations in high speed situation (off peak hours and motorway) apart from the original factor in Persian MRBQ, i.e. speed violation. This paper is intended to evaluate effects of accident history and socio economic factors to nine factors found in Putranto and Rostiana (2015). The reader are asked to aware that in Putranto and Rostiana (2014b) only six factors from Persian MRBQ were used for analysis.

### 3. METHODOLOGY

Data collection was conducted in three of five original cities in the research proposal. As the funding granted by the Directorate General of Higher Education was only about 65% of the proposed budget, some modification was made as indicated in Table 2.

Tabel 2. Modification of number of cities and number of respondents

Research Proposal		Research Implementation	
Cities	Number of Respondents	Cities	Number of Respondents
Pontianak	120	Pontianak	203
Manado	120	Manado	200
Medan	120	Pangkalpinang	201
Surabaya	120		
Ambon	120		
Total	600		604

It can be seen that although number of cities were decrease but number of total resepondents were still above 600. Finally 604 questionnaires were completely filled. Survey in Pontianak (representing Kalimantan/ Borneo island) and Manado (representing Sulawesi island) were conducted as proposed (although number of respondents was increased). In these cities research counter parts supported by local students were available. Medan (representing Sumatra island) was removed due to inavailability of research counterpart and replaced with Pangkalpinang. The replacement city had a unique characteristics regarding motorcycle riders, i.e. balance gender ratio between male and female riders and high proportion of very young riders (younger than licensing age). Knowledge on riders in Java island can be represented by two preliminary surveys by the research team in Jakarta (Putranto and Anjaya, 2014) and (Putranto et al, 2014). Even the questionnaires used in Pontianak, Pangkalpinang and Manado was based on questionnaire improvement process after surveys in Jakarta. One of the feature of improvements was combination of *favourable* and *unfavourable* statements in the questionnaire to avoid social desirability.

Each factor then represented by the mean score of items within the factor. The mean of this composite factor scores were compared between pairs of groups of respondents based on:

- Monthly expenditure ( $\geq 3$  million IDR or  $< 3$ million IDR) as a proxy of wealth level
- Gender
- Marital status (married or unmarried)

- Age (40-60 years old representing middle adulthood or 18-39 years old representing young adulthood in Erikson's stages of development)
- Accident history in the last one year (at least involve in one accident or not)
  - Blamed in the accident (blamed or not blamed)

Means of nine composite factors (Putranto and Rostiana, 2015) were compared between groups. A 0.05 significant level was used. IBM SPSS Statistics 22 was used to help analysis.

#### 4. CHARACTERISTICS OF RESPONDENTS

According to prediction of local expert, gender ratio between male and female motorcycle riders in Pangkalpinang is about 1:1. This was not the case for other cities, i.e. about 2:1 in Pontianak and about 3:1 in Manado. The final gender ratio the sample in each city was about 55:45 in Pangkalpinang, 65:35 in Pontianak and 73:27 in Manado respectively. The overall gender ratio in three cities was 64:36.

Respondents in Pangkalpinang were between 14 and 60 years old (mean 23.1 years old). Although respondents under licensing age (younger than 17 years old) were only five persons, in real life there was social pressure to ride motorcycle in very early age. Respondents in Pontianak were between 18 and 55 years old (mean 24.7 years old). Respondents in Manado were between 16 and 67 years old (mean 26.6 years old). Respondents under licensing age were 3 persons. The overall respondents mean age in 3 cities was 24.8 years old. The other characteristics of 604 respondents filling the Indonesian MRBQ were as presented in Table 2.

Table 2. Characteristics of respondents

Characteristics	Percentage of respondents			
	Pangkal Pinang	Pontianak	Manado	Three Cities
Married	18	23	35	25
From outside the province	4	5	21	10
Live in the capital of province	73	3	27	34
Monthly expenditure less than USD 80	69	73	56	65
Involve in at least an accident in last one year	83	83	62	75

#### 5. SUMMARY OF THE COLLECTED DATA

Table 3 shows the summary of the collected data. It describes mean scores of each 38 item statement for each city and for three cities.

The respondents in three cities were relatively low risk riders because none of the mean scores were above three. The highest mean score was 2.99 (TV30-smoking while riding in Manado).

Stunts were clearly less frequent conducted. All mean scores of statement items on stunts were less than 1.35. The lowest mean score was 1.04 (S34- have a crash with a parked vehicle and make damage to it, but escape from crash scene) in Pontianak.

If factors in Persian MRBQ were used in three cities, the highest mean of composite factor scores was from control error factor (2.02). This was followed by traffic error (1.98), speed violation (1.93), safety violation (1.85), traffic violation (1.77) and stunt (1.19) respectively. The fact that the mean of composite factor scores from two error related factors

were the highest suggested that there were problems with riding skills of respondents from three cities. Among three violation factors, the highest mean of composite factor scores was from speed violation factor, suggesting that speed related violations were dominant in three cities. Stunts involve acrobatic movements of motorcycles. Such behaviours require very high riding skills and therefore had scores far below other behaviours.

Table 3. Summary of the collected data

Statement Item	Mean Score			
	Pangkal Pinang	Pontianak	Manado	Three Cities
TE1	1.81	1.80	1.72	1.78
TE2	2.00	1.96	1.91	1.96
TE3	2.07	1.92	2.30	2.10
TE4	2.34	2.80	2.03	2.39
TE5	1.82	1.70	1.74	1.75
TE6	2.53	2.07	2.35	2.31
TE7	1.89	1.72	1.91	1.84
TE8	1.86	1.90	1.60	1.79
TE9	1.85	1.90	1.87	1.87
TE10	2.15	1.74	2.18	2.02
SV11	1.73	1.43	1.65	1.60
SV12	2.04	1.63	1.95	1.87
SV13	2.51	2.09	2.35	2.32
SV14	2.41	1.92	2.23	2.19
SV15	1.92	1.63	1.85	1.79
SV16	1.62	1.51	1.60	1.58
SV17	1.75	1.62	1.76	1.71
SV18	2.72	1.68	2.54	2.31
SV19	2.13	1.57	2.30	2.00
S20	1.33	1.08	1.30	1.24
S21	1.34	1.14	1.32	1.26
CE22	2.26	1.99	2.15	2.13
CE23	2.38	1.90	2.42	2.23
CE24	2.44	1.67	2.42	2.18
SAV25	1.31	1.24	1.24	1.26
TV26	1.59	1.63	1.61	1.61
TV27	1.53	1.36	1.70	1.53
TV28	1.23	1.16	1.46	1.28
TV29	2.06	2.06	1.89	2.00
TV30	2.62	1.68	2.99	2.43
SAV31	1.90	1.57	2.36	1.94
CE32	1.87	1.63	1.98	1.83
SAV33	2.19	1.68	2.37	2.08
S34	1.09	1.04	1.08	1.07
SAV35	1.53	1.16	1.36	1.35

SAV36	2.07	1.81	2.33	2.07
SAV37	2.58	2.00	2.63	2.40
CE38	1.87	1.47	1.79	1.71

## 6. EFFECTS OF ACCIDENT HISTORY AND SOCIO ECONOMIC GROUPS

Tables 4 to 9 show the results of mean difference t-test of factors composite scores between different accident history in the last one year and different socio economic groups. Table 4 shows that respondents involved in at least an accident in the last one year were more frequently conduct speed violations, safety violations, high speed violations, stunts, control errors and traffic violations. Table 5 shows that there were no significant difference of motorcycle rider behaviours in three cities between blame/ not blamed respondents as guilty rider in the accident.

Table 4. Factors Composite Scores from Different Accident History Group Mean Difference

Factors	Mean Composite Scores				
	Have Accident History# (N=146)	No Accident History# (N=458)	Mean Difference	Significant Level	Significant? (Yes/No)
SV*	2.145	1.780	0.365	<0.001	Yes
SAV*	2.303	2.084	0.219	0.004	Yes
TE*	1.968	1.935	0.033	0.575	No
HSV*	2.613	2.136	0.477	<0.001	Yes
S*	1.397	1.210	0.187	0.002	Yes
CE*	2.246	1.971	0.275	<0.001	Yes
SEV*	1.678	1.556	0.122	0.058	No
TV*	1.579	1.353	0.226	0.003	Yes
MCV*	1.824	1.728	0.096	0.141	No

# accident history in the last one year

Table 5. Factors Composite Scores from Different Blamed Group Mean Difference

Factors	Mean Composite Scores				
	Not Blamed## (N=90)	Blamed## (N=51)	Mean Difference	Significant Level	Significant? (Yes/No)
SV*	2.131	2.139	-0.009	0.948	No
SAV*	2.311	2.261	0.050	0.741	No
TE*	1.971	1.984	-0.013	0.903	No
HSV*	2.461	2.755	-0.294	0.172	No
S*	1.363	1.431	-0.069	0.533	No
CE*	2.274	2.143	0.131	0.353	No
SEV*	1.589	1.779	-0.191	0.110	No

TV*	1.589	1.598	-0.009	0.951	No
MCV*	1.789	1.876	-0.087	0.527	No

## blamed as the guilty rider in the accident

Surprisingly, wealthier respondents tend to conduct motorcycle carrying capacity violations compare to less wealthier respondents (Table 6). Compare to female respondents, male respondents were more frequently conduct speed violations, high speed violations, stunts, stopping errors/ violations and motorcycle carrying capacity violations (Table 7).

Table 6. Factors Composite Scores from Different Monthly Expenditure Group Mean Difference

Factors	Mean Composite Scores				
	<3 Millions IDR (N= 556)	≥3 Millions IDR (N= 48)	Mean Difference	Significant Level	Significant? (Yes/No)
SV*	1.865	1.906	-0.042	0.668	No
SAV*	2.138	2.124	0.014	0.908	No
TE*	1.932	2.075	-0.143	0.125	No
HSV*	2.249	2.281	-0.032	0.852	No
S*	1.243	1.396	-0.153	0.106	No
CE*	2.027	2.160	-0.132	0.233	No
SEV*	1.569	1.781	-0.212	0.086	No
TV*	1.393	1.573	-0.180	0.071	No
MCV*	1.723	2.077	-0.354	0.005	Yes

Table 7. Factors Composite Scores from Different Gender Group Mean Difference

Factors	Mean Composite Scores				
	Male (N= 389)	Female (N= 215)	Mean Difference	Significant Level	Significant? (Yes/No)
SV*	1.921	1.772	0.149	0.005	Yes
SAV*	2.150	2.114	0.035	0.609	No
TE*	1.919	1.988	-0.069	0.190	No
HSV*	2.346	2.081	0.264	0.007	Yes
S*	1.312	1.152	0.160	<0.001	Yes
CE*	2.063	1.992	0.071	0.256	No
SEV*	1.623	1.519	0.104	0.039	Yes
TV*	1.422	1.381	0.040	0.475	No
MCV*	1.809	1.647	0.162	0.003	Yes

Table 8 shows that compare to married respondents, unmarried respondents tend to conduct speed violations, high speed violations and stunts more frequently. Table 9 shows that younger respondents (<40 years old) tend to conduct speed violations and high speed

violations more frequently.

Table 10 shows the comparison results of mean difference analysis between Putranto and Rostiana (2014b) and this present paper. It can be seen that the only clear distinction was the effect of wealth level and gender. It should be noted that SV\* and HSV\* were originally split from SV.

Table 8. Factors Composite Scores from Different Marital Status Group Mean Difference

Factors	Mean Composite Scores				
	Single/ Widower (N= 451)	Married (N= 153)	Mean Difference	Significant Level	Significant? (Yes/No)
SV*	1.923	1.706	0.217	<0.001	Yes
SAV*	2.123	2.181	-0.058	0.445	No
TE*	1.954	1.912	0.041	0.469	No
HSV*	2.338	1.997	0.341	0.001	Yes
S*	1.284	1.170	0.114	0.010	Yes
CE*	2.065	1.958	0.107	0.101	No
SEV*	1.590	1.572	0.018	0.751	No
TV*	1.385	1.474	-0.089	0.150	No
MCV*	1.730	1.815	-0.085	0.184	No

Table 9. Factors Composite Scores from Different Age Group Mean Difference

Factors	Mean Composite Scores				
	≥ 40Years Old (N= 62)	< 40 Years Old (N= 542)	Mean Difference	Significant Level	Significant? (Yes/No)
SV*	1.638	1.894	-0.256	<0.001	Yes
SAV*	2.070	2.145	-0.075	0.488	No
TE*	1.881	1.951	-0.070	0.401	No
HSV*	1.887	2.293	-0.406	0.008	Yes
S*	1.177	1.264	-0.086	0.161	No
CE*	1.876	2.056	-0.180	0.067	No
SEV*	1.669	1.576	0.093	0.262	No
TV*	1.395	1.409	-0.014	0.879	No
MCV*	1.753	1.751	0.002	0.984	No

Table 10. Difference between results from Putranto and Rostiana (2014b) and present paper

Basis of Grouping	Factors with Statistically Significant Mean Composite Scores Difference	
	Putranto and Rostiana (2014b)	Present Paper
Accident history	TE, SV, S, CE, SAV, TV	SV*, HSV*, CE*, SAV*, TV*

Wealth level	S	MCV*
Gender	SV	SV*, HSV*, S*, SEV*, MCV*
Marital status	TE, SV, S	SV*, HSV*, S
Age	SV	SV*, HSV*

## 7. CONCLUSIONS AND RECCOMENDATIONS

The following conclusions can be made from the analysis that have been carried out in this paper, i.e.:

- Respondents were relatively low skill but low risk riders.
- Stunts were less frequently conducted by respondents.
- Speed violations were dominant within violation behavioru of the respondents.
- Respondents involved in at least an accident in the last one year were more frequently conduct speed violations, safety violations, high speed violations, stunts, control errors and traffic violations.
- Surprisingly, whealtier respondents tend to conduct motorcycle carrying capacity violations compare to less whealtier respondents.
- Compare to female respondents, male respondents were more frequently conduct speed violations, high speed violations, stunts, stopping errors/ violations and motorcycle carrying capacity violations.
- Compare to married respondents, unmarried respondents tend to conduct speed violations, high speed violations and stunts more frequently.
- Younger respondents (<40 years old) tend to conduct speed violations and high speed violations more frequently.

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