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## Driver behaviour and traffic issues

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### ABSTRACT

*The main investigation of this study is: to identify driver mistakes they make and driving behaviour which depends on a questionnaire, which may cause traffic fatalities and highlight their effect on traffic safety. Also, to develop traffic accidents regression prediction models. The purpose is to reduce the frequency and severity of traffic accidents. All the analysis depends on the questionnaire by using SPSS software to predict accident rates and compare the results with the model reports developed in Chichbhavan to Buttibori. The data for this study was collected from a survey questionnaire which was distributed to a sample of drivers in Chichbhavan to Buttibori. The data from the survey questionnaire were analyzed and used in forming the regression models. It was found that the driver's behavior is considered aggressive, in the first part of the study is to identify the behavior of the driver and the second part is to frequency and percentage of the coefficient of determination. In conclusion, aggressive behavior increases the chance of exposure to accidents.*

**Keywords**— Driver behaviour, Statistical Package for the Social Sciences

### 1. INTRODUCTION

India is a country which has the highest fatality rate which is caused due to accident. Most of the common reason of accident is driver behavior that includes different action of physically, psychologically and emotionally of driver behavior, development of behavior. The number of fatalities in the accidents has continued to rise despite the fewer accidents. It is every day experience that neither driving habits nor enforcement of traffic rules have improved to any extent. One the most world's largest injuries problems is road traffic crashes. The study of aggressive behavior of driver for the crashes or violation on the road at the time of driving is very important for the traffic safety. Most of the studies found the driving behavior and driver's attitude that include some factors like weather conditions, faulty vehicles and design errors. For our highway Aggressive driving becomes very norm in condition of surviving on road. The road rage incidents are traveling public frequently. According to the World Health Organization more than 1million people die every year and 50 million people injured in traffic crashes in the world. The death rate of South Africa is highest almost 60 million are suffer from the crashes or violations. And the lowest rate is found in Europe. According to the survey of government of India 382 people die every day in India. There are many reasons of happening the accidents. In 5 years the rate are increases as compare to last years because of ignoring the safety. National Crime Records Bureau (NCRB) reports every year that the more than 1, 40, 000 traffic related death causes in India.

### 2. PAPER REVIEWED

Catherine Gabande (2014) studies that to use d the drivers' behavior questionnaire survey. In that survey included the participated drivers for finding the relation between driver behavior questionnaire factor and exposure accidents. 1500 driver was participating for finding the behavior included only elder's driver and analyzed the variance between the age behaviors of driver. The 3 factor identified that are inattention error, dangerous error and dangerous violation. For that 3 factor using the 11.5 version of SPSS software for analyzing and correlate the behavior with driver behavior questionnaire.

Mamidi kiran kumar et al, was research and gave a new concept. In this paper Driver Behavior Analysis Model and Prediction Model in that collects various data about behavior of driver in driver classification model and different vehicles data which is based on the On Board Diagnostic. It creates by using the methods it would belong to save driving or not save driving which determines the current driving behavior. A number of sources of drivers current control actions which probably scanning of driver and surrounding of environment traffic which are using for analyzing the data about driver behavior in regression model of characterized as probabilistic model.

Danish Farooq et al, was research on Analysis of Young Driver Behavior created to road safety issue it wound founds that the behavior of young drivers. It would collect the data from driver questionnaire behavior method for comparing the two cities of

data about young driver. It survey of 70 students from each of the city. In driver questionnaire behavior includes the demographic characteristics of driver and experience of driving. Mostly participates are compared both male and female. Only young driver are participated in both the reasons by using the ANOVA method analysis the behavior.

Mohammed Najeeb was research on a study of psychological factors in this various dimensions is measuring by questionnaire in psychological factors. For the tendency to aggressive driver psychology and about the sensation seeking questionnaire are used. For the collection of data 500 drivers are participates about their age, experience and education level. By using ANOVA it came to knowing the frequency variance of the data and finding the variance. It would be identifying the driver aggression, hostility, external control towards the violation of behavior of traffic rules.

### 3. SITE SELECTION

The free flow road has the quality to driving at high speed but there is some site frictions which distracts the driver at the time of driving and affects the driver behavior. The site of free flow roadway of driver facing many problems in behavior of driving which includes the changes of driver behavior that gave the knowledge of the driver behavior. It would include the behavior of driver that contributed the traffic fatalities and violations. The data from site will give the real and actual information about the actual behavior of driver during the time of driving. The data is collected from the site by questionnaire method in two parts first is to driver behavior is aggressive or not and the second part is to represent the drivers mistakes. In questionnaire some questions are prepare. First part is represented the percentage of respondent participants. The study is depend on questionnaire of two parts, the first part is to explore the accidents and study on aggressive behavior of driver. The second part is to collection of data about the main causes of accident which relates the driver behavior. The data should be collected and used for the predicted regression model in programmer SPSS.

**Table 1: Data about participants in the questionnaire**

Gender	Participants	All	Male	Female
Age		312	256	56
	18-24	69	52	17
	25-31	90	69	21
	32-38	67	56	11
	39-45	45	42	3
	46-52	35	31	4
	53-59	6	6	0
Vehicle Ownership	Personal	211	170	41
	Family	101	79	22

The above table of data are represents the respondent of driver in different categories which shows the different age group and gender and the vehicle information.

#### 3.1 SPSS (Statistical Package for the Social Sciences)

- (a) SPSS is a widely used program for statistical analysis.
- (b) It is also used by market researchers, health researchers, survey companies, government, education researchers, marketing organizations and others.
- (c) It has been described to analysis and correlates the relationship between the dependent and independent variables.
- (d) Some are the features of the base software: Descriptive statistics, ratio statistics, frequency, mean, mode, t-test, ANOVA, correlation, linear regression are analyzed.

### 4. ANALYSIS AND RESULTS

This deals with the results and its discussion which was adopted in order to achieve the objective of the project. These results contain two separate analysis is follows:

Reliability analysis allows you to study the properties of measurement scale and the items that compose the scale. The Reliability Analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale. Internal consistency of scale is measured using Cronbach-alpha coefficient.

**Table 2: Reliability data of all Variables**

Case	N	%
Valid	312	93.1
Excluded	23	6.9
Total	335	100.0

**Table 3: Reliability Statistics**

Cronbach's alpha	N of items
0.048	24

Descriptive analysis was performed in order to perform overall satisfaction and specific service quality attribute. Mean, Standard Deviation and number of valid response were summarized in Table 7.3. The mean of overall satisfaction indicate that driver are not must satisfied their behavior (Mean=2.75, SD=1.4).

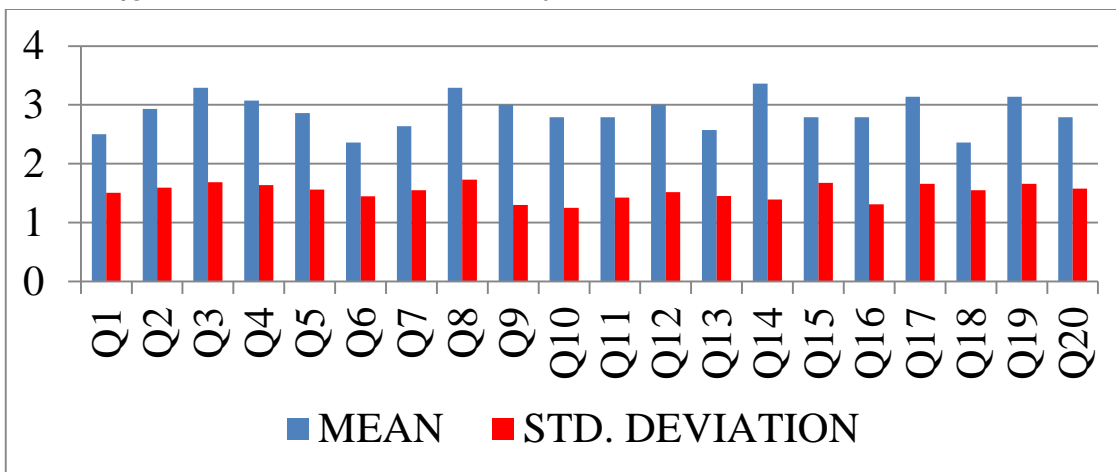


Fig. 1: Percentage of Mean and Std. Deviation

Frequency in SPSS would give a table telling how many samples and provide this by percentage different question have a different frequency. There are 20 questions according to the questionnaire each variable have 5 options never, seldom, sometimes, often and always are in every question. By the programming outcomes are follows.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	never	56	16.7	17.9	17.9
	seldom	62	18.5	19.9	37.8
	sometimes	27	8.1	8.7	46.5
	often	14	4.2	4.5	51.0
	always	153	45.7	49.0	100.0
	Total	312	93.1	100.0	
Missing	System	23	6.9		
Total		335	100.0		

Fig. 2: Sample frequency of question 1

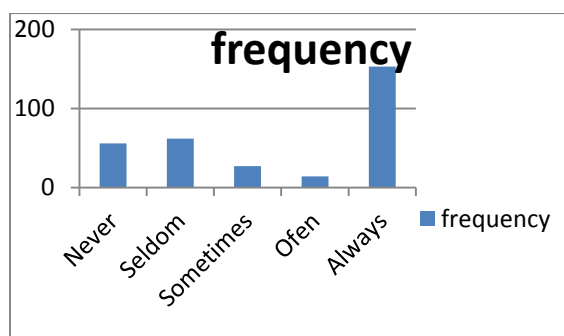


Fig. 3: Sample frequency graph of question 1

In the factor analysis found the descriptive analysis which are determining the independent variables and correlate all the variables. KMO and Bartlett's Test measure the simple adequacy where chi square (272.55) and the value of KMO test (.478). There are 10 variances of component transformation which is measure to extraction method and the component transformation.

Regression analysis is used to define importance of every factor for general level of satisfaction. Independent variables explain the variance of dependent variable. The coefficients that corresponds to significant connections between variables (sig. <0.05) are for the following dimensions Table below shows the coefficients resulting from regression analysis.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.596	.503		7.148	.000
	forcing a vehicle to the roadway	.029	.037	.046	.797	.426
	forcing a vehicle to pull over	-.011	.043	-.015	-.255	.799
	braking suddenly	-.032	.040	-.047	-.806	.421
	drive slow on the right of multilane roads	-.064	.040	-.091	-1.599	.111
	deliberately obstruct the road, such as preventing other drivers from passing	-.006	.041	-.008	-.137	.891
	excessive high speed	.015	.043	.020	.348	.728
	excessive low speed	-.070	.041	-.100	-1.709	.088
	unwillingness to extend corporation to others in sever traffic conditions	-.105	.040	-.151	-2.651	.008
	running red lights	.043	.044	.059	.993	.321
	running yellow lights	.061	.042	.087	1.468	.143
	flowing closely	-.025	.043	-.034	-.593	.554
	improper lane changes (without indicating)	.025	.043	.035	.593	.554
	weaving in and out of traffic	-.005	.042	-.007	-.124	.902

parking on traffic lanes	-.030	.042	-.043	-.719	.473
drive wrong side	.008	.042	.012	.201	.841
collective aggression	-.032	.042	-.044	-.762	.446
failure to yield the right of way others	.007	.041	.010	.177	.860
yelling	-.040	.041	-.057	-.989	.324
pursuing a vehicle	-.116	.043	-.164	-2.701	.007
regularly honking	.066	.040	.093	1.623	.106

a. Dependent Variable: faced accident

Fig. 4: Coefficient of Regression Analysis

Relationship between the dependent and the independent variables of the form:

$$\begin{aligned}
 \text{Faced accident} = & 3.596 + (.029 * q1) + (-.011 * q2) + (-.032 * q3) \\
 & + (-.064 * q4) + (-.006 * q5) + (.015 * q6) + (-.070 * q7) + (-.105 * q8) + (.043 * q9) \\
 & + (.061 * q10) + (-.025 * q11) + (.025 * q12) + (-.005 * q13) + (-.030 * q14) + (.008 * q15) \\
 & + (-.032 * q16) + (.007 * q17) + (-.040 * q18) + (-.116 * q19) + (.066 * q20)
 \end{aligned}$$

The method of least squares that leads to the best fitting line of a postulated form to a set of data is used to form Regression Models

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$$

- Y<sub>i</sub>= Dependent variable
- X<sub>i</sub>= Independent variable
- β<sub>0</sub>= Coefficient of constant

The sample is below of every variable for the coefficient determination. R is the coefficient determination

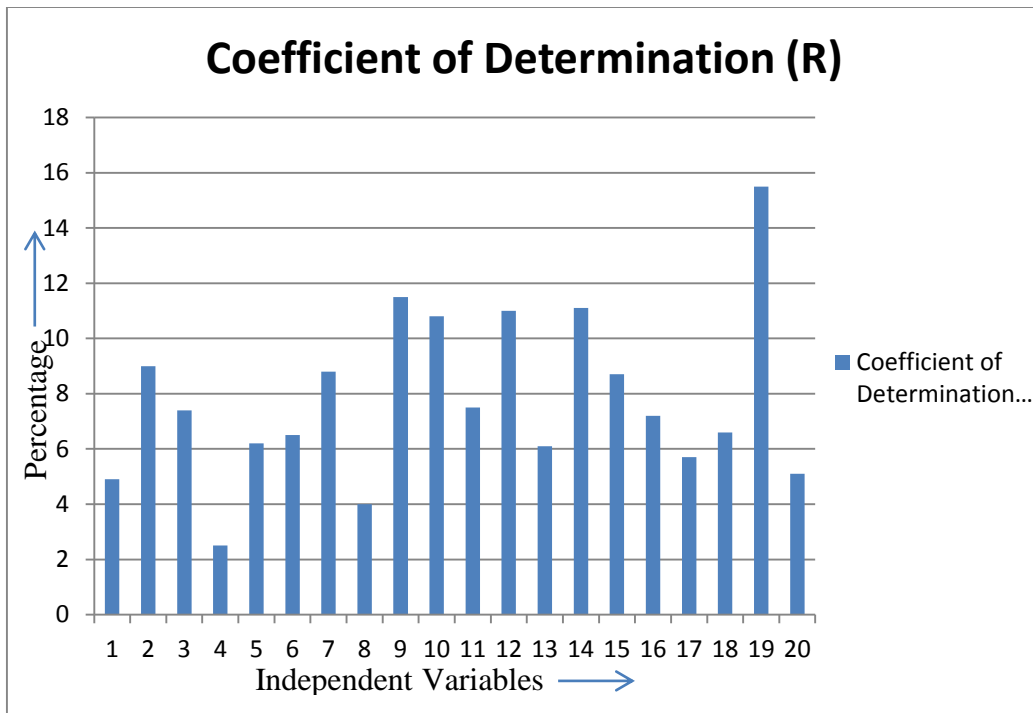
Table 4: Sample of Coefficient of Determination (R)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.521 <sup>a</sup>	.272	.229	.435	2.622

Table 5: Coefficient of Determination

Independent variables (Y1, Y2.... Yn)	Beta In (β1, β2..... βn)	Independent variables (X1, X2,.....Xn)	R <sup>2</sup> (Coefficient of Determination)	R (In %)
1	0.51	2.74	0.049	4.9
2	0.114	2.68	0.090	9.0
3	0.178	2.26	0.074	7.4
4	0.017	2.84	0.025	2.5
5	0.057	2.79	0.062	6.2
6	0.057	2.42	0.065	6.5
7	0.079	2.26	0.088	8.8
8	0.033	2.89	0.040	4.0
9	0.096	2.89	0.115	11.5
10	0.096	2.84	0.108	10.8
11	0.183	3.11	0.075	7.5
12	0.090	3.32	0.110	11.0
13	0.224	2.53	0.061	6.1
14	0.121	3.0	0.111	11.1
15	0.115	3.0	0.087	8.7
16	0.187	2.58	0.072	7.2
17	0.004	3.0	0.057	5.7
18	0.083	2.84	0.066	6.6
19	0.009	2.95	0.155	15.5
20	0.386	2.89	0.051	5.1

Table 5 shows the result of all the independent variables which compute the dependent variable that the value of R explains the behavior of the driver causes the accidents. Drive slow on the right on multilane roads is minimum of only 4% at that stretch and pursuing a vehicle is the maximum percentage of 15.5% of driver behavior that makes mistakes and causes of accidents.



**Fig. 4: Graph of Coefficient of determination**

There was a strong direct relationship between driver behaviors and their exposure to accidents. Coefficient of determination shows the percentage of the behavior of driver that highest aggressive behavior is pursuing a vehicle (15.5%), running red light (11.5%), parking on traffic lanes (11.1%), and improper lane changing (11%), running yellow light (10.8%), and forcing a vehicle pull over (9.0%).

## 5. CONCLUSION

The paper investigated the driver behavior id aggressive or not analysis the frequency of that particular behavior according to the questionnaire set of questions whose responses are in never, seldom, sometimes. Often, and always. In all that first part to represent the main causes of fatalities which relate to the accidents some main causes are:

- (a) Pursuing a vehicle or to close flowing the vehicle
- (b) Lane violation like zigzag passing or improper (suddenly) lane changing
- (c) Excessive high speed and ignoring the side friction
- (d) Running stop signs and signal violation

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