THE PREDICTIVE INFLUENCE OF DEMOGRAPHIC AND PERSONALITY TRAITS ON RISKY DRIVING BEHAVIOUR AMONG TRAFFIC OFFENDERS IN OSUN STATE, NIGERIA

ABSTRACT

Aim: Accidents are a common phenomenon on Nigerian roads and are attributed to individual, environmental and contextual factors such as excessive speeding, disobeying traffic laws, aggressive driving among others. This study investigated the predictive influence of demographic and personality traits on risky driving behaviour among traffic offenders in Osun state, Nigeria.

Study design: cross-sectional survey design

Place and Duration of Study: Federal Road Safety Commission office and Redeemer's University Osun State, South western Nigeria.

Methodology: Two hundred and seventy-seven (277) traffic offenders were selected through systematic sampling technique from the population of traffic offenders docked by Traffic offenders Tribunal and formally screened using Driving Behaviour Survey (DBS) and Big-five Personality Inventory (BFI). Descriptive and inferential statistics was used for data analysis.

Results: Personality traits jointly predicted risky driving behaviour (R^2 = .612; p =.0050. Extraversion (β=-.45; t= -6.99), agreeableness (β= 41; t = 3.98), conscientiousness (β=.17; t = 3.68), and openness to experience (β=-.27; t= -4.20) significantly independently predicted driving. Extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences jointly predicted anxiety based performance (R^2 = .22, *p*= .000), exaggerated safety caution behaviour (R^2 = .76, *p*= .000), and hostile aggressive behaviour (R^2 = .67, *p*= .000). Demographics variable were observed to be weak predictors of risky driving behaviour (R^2 = .028; p= .399) among the traffic offenders.

Conclusion: There was high incidence of risky driving behavior among traffic offenders; extraversion, agreeableness conscientiousness and open to experience were factors predicting risky driving behavior. The study recommends psychological assessment for traffic offenders.

Key words: Personality traits, traffic offenders, risky driving behaviour.

1. INTRODUCTION

Risky driving refers to the use of a vehicle in a way which makes people vulnerable to harm or injury .This phenomenon has reached a pandemic height and has become one of the most precarious daily challenges in Nigeria. This aberrant behaviour establishes dangerous or risky driving behaviour. This

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behaviour consequently puts the life of the driver and the lives of other road users in danger [1] The Federal Road Safety Commission (FRSC) (Establishment) Act in its interpretation part (i.e. section 30) characterizes risky driving as "driving in a way that is risky, unsafe, hazardous, careless, reckless and perilous in any conditions of the case" [2]. Risky driving comprises both careless and reckless driving practices.

Ben-Ari, Mikulincer and Gillath [3], distinguished between four major driving styles: (a) reckless and careless driving, (b) anxious driving, (c) angry and hostile driving, and (d) patient and careful driving.

All over the world, about 1.2 million people are killed and 20 to 50 million more are injured or disabled annually due to road traffic crashes [4]. According to Roberts, Mohan and Abbasi [5] the losses account for 2.1% of global mortality and 23% of deaths due to injury. Road traffic accidents impose substantial psychological distress and economic costs both in micro and macro scales. Factors that cause road crashes fall into three categories: environmental (e.g. undivided, curved, or inclined and accident-prone roads; lighting, weather conditions and visibility of objects), vehicle (e.g. security equipment, safety maintenance), and human factor (driver's mental and physical capacity, driving style, violations and errors) [6].

The traffic studies have copious evidences that indicate diverted attention or distracting activities which could lead to poor judgment, aggressive driving and hazardous drunk-driving habit [7, 8]. Any driving behaviour performed purposely and with the goal of harming such as road rage, disobeying signals, tossing objects, mirror smashing, side-swiping and constraining a driver off the road are referred to as risky driving behaviour.

The factors as predictors of risky driving behaviours and harmful driving outcomes range from psychological, social, environmental to contextual factors. In all, human factors are associated with road accidents and the primary factor leading to road crashes. Thus, there is need to understand the underlying behavioural and cognitive mechanisms of such behaviours. Driving is a complex and goal-directed behaviour that relies on various higher-orders cognitive processes which encompass executive functions. The list of risk factors is endless, however, this study attempts a serious scrutiny of identified demographic and personality traits as predictors of risky and dangerous driving behaviour. The analysis of psychological variables by which the risky driving and road traffic rules violations could be explained still remains significant.

Scientists agree that personality can influence how individuals approach and behave in certain driving situations [9]. It is believed that certain personality traits determine driver's specific attitudes in risky driving. Personality is a vital part of psychological variables influencing human behavior [8]. This behaviour may likewise incorporate driving behaviour. The big five traits include openness, conscientiousness, extraversion, agreeableness and neuroticism [10]. Openness reflects the level of intellectual interest, resourcefulness and an inclination for curiosity. Conscientiousness describes the predisposition to be reliability, orderliness and the feeling of obligation. Extraversion attribute is represented by vitality, positive feelings, friendliness and the tendency to look for incitement in the organization of others. Agreeableness involves the propensity to be caring and helpful as opposed to being suspicious or adversarial towards others. For a neurotic personality it involves exhibiting undesirable feelings effortlessly such as outrage, nervousness among others. Personality traits have

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been accounted for as one of the factors influencing intentional road conducts among drivers [8]. Also, studies have shown that drivers with low agreeableness and conscientiousness but high neuroticism tend to violate road traffic rules and drive under the influence of alcohol [11].

High fatality rate as a result of road accidents is now acknowledged to be a global phenomenon. The road accidents have been identified as a major cause of global mortality as well as physical disability Reduction of road accidents is of a concern for everyone as well as cardinal goal of Decade of Action for Road Safety (2011-2020).

Many studies have addressed the causes and controls of motor vehicle accidents on the highways. The constant need for shift or transportation globally today makes road accident an inevitable but preventable phenomenon. Road traffic injuries and accidents still pose a major public health challenges that require concerted efforts to reduce through effective and sustainable method of preventions. Despite the growing burden of road traffic injuries, the road safety officials have received insufficient attention at both the international and national levels. This study investigated predictive influence of personality traits and demographic factors on risky driving behaviour among traffic offenders in Osun State southwestern Nigeria.

1.1 Research Hypotheses

1. Personality traits (OCEAN) will jointly significantly predict risky driving behaviour among the participants.
2. Demographic factors –age, marital status, and education will jointly significantly predict risky driving behaviour among the participants.

2. MATERIAL AND METHODS

2.1 Research Design

The study was an ex post-facto which utilized the cross-sectional survey method to gather data. The independent variable was personality-traits while the dependent variable was driving behaviour. In addition, the socio-demographic factors were used as secondary variables. They included: age, gender, participant's level of education, position in the family and family type.

2.2 Research Setting

The setting was the FRSC offices located in Osogbo, Ile-Ife and Gbongan in Osun state, southwestern Nigeria.

2.3 Participants

The participants were individuals apprehended and convicted for traffic offenses by the Federal Road Safety Commission (FRSC) officers. A total of two hundred and eighty -three (283) male and female participants (mean age = 34.34 years) took part in the study. The Participants were recruited from February 2018 to April 2018 in the FRSC offices. Participants were fully informed about the aims and scope of the study and they were assured that all information would be kept anonymous in the analyses and in the report of the study.

2.4 Sampling Technique

A multi-stage sampling technique was employed in the selection of the offenders. The first three clusters out of six were selected through balloting. These centres includes: Oshogbo, Ife and

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Gbongan. At these centres, two hundred and eighty -three were sampled through systematic sampling technique. Every third offender, arraigned by FRSC officers sitting for a period of hours was interviewed and questionnaires were administered to them after their judgment had been delivered.

2.4.1 Sample Size Estimation

Using a sample size formula by Kish [12], the sample size formula for a single proportion is stated below:

$$N = \frac{\left(\frac{Za}{b}\right)^2 pq}{d^2}$$

Where:

N = required sample size

Za/b = Z-scores corresponding to a one sided test = 1.96

p = estimated population proportion (prevalence) of the delivery rates assuming 56% (0.56)

q = 1-p

d = acceptable margin of error at 5% (standard value of 0.05)

2.4.2 Calculations:

$N = (1.96)^2 \times 0.52 \times 0.48 / 0.05^2$.

$N = 3.8416 \times 0.2496 / 0.0025$

$N = 0.4978 / 0.0025$

$N = 383.545344$

$N = 384$

However, using the modified Kish [12] formula for available sample size

$= N [1 + (N -1)/K]$

K= available number of traffic offenders convicted (average of 4495 per annum in Osun State) [13]. However, due to constraints and logistics, permission was granted for only three centers which constituted 50% of the sample estimate. Hence the annual rate was estimated at 2248.

Hence $K = 384 [1 + (384 – 1)/2248] = 328.01 = 328$

After adjusting for 10% attrition rate, using

$F = n/1-nr = 328/1-10\%$

$= 328 /1-0.9 = 364$

The expected sample size for the study was 364. However due to the nature of the inclusion criteria for the study, only repeated traffic offenders were sampled for the study.

Only two hundred and eighty -three (283) were repeated offenders included in the study.

2.4.3 Inclusion criteria

All the traffic offenders were: 1) drivers; 2) non-accidental traffic violations taken to the FRSC office 3) all drivers willing and able to complete written questionnaires.

2.4.4 Exclusion criteria

The exclusion criteria for both groups are listed below

1) Drivers that were not willing or not able to complete written questionnaires;

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2) Drivers that had severe health issues such as psychiatric disorders or somatic disorders.

2.5 Measures

A battery of test was administered in form of questionnaire to collect data for the study. These are:

Driving Behavior Survey (DBS): The DBS [14] was used to measure anxious driving behaviour. This measure consists of 21 items that index the frequency of anxious driving behaviour across three domains: anxiety-based performance deficits: 1, 4, 5, 6, 9, 14, 21; exaggerated safety/caution behaviors: 3, 8, 11, 12, 13, 16, 19; hostile/aggressive behaviors: 2, 7, 10, 15, 17, 18, 20 (Note: DBS subscales scored as the mean of endorsed items). The items were rated on a 1 to 5 Likert-type scale with higher mean scores indicating greater frequency of anxious behaviour. As previously noted, the DBS sub-scales had shown strong internal validity and consistency as well as convergent associations in prior research with both college and treatment-seeking samples [15, 14, 16]. DBS sub-scales were calculated by finding the scores across the seven items in each behavioural dimension. In the current sample, all three scales showed good to excellent internal consistency (α = .85–.93) and good test– retest reliability between post-treatment assessments (r = .80–.85).

Big-five Inventory (BFI) by John, Donahue, & Kentle, [17].

The version of the five inventories includes 44 questions with short phrases that were graded on a five-degree scale from completely disagree=1 to completely agree=5. Cronbach's Alpha coefficients for the five factors of neuroticism, extraversion, conscientiousness, agreeableness and openness were 0.78, 0.61, 0.68, 0.74 and 0.75 respectively.

2.6 Procedure

Approval for this study was obtained from the FRSC sector commandant. The researcher was duly introduced to the offenders who were arrested. The researcher then educate the officers and offenders on the aim and objectives of the study, the inherent benefits, risks involved and the right to withdraw whenever they liked. Participants were randomly selected through the systematic sampling technique. Every third offender that appeared before the court was summarily examined and assessed with the questionnaire. They were screened for risky driving behaviour and personality traits. Those who met the inclusion criteria were considered suitable for inclusion in the study.

2.7 Data Analysis

The data was analyzed using the statistical package for social sciences SPSS 20.0 Software. Both the descriptive and inferential statistics were used for the analysis of data for this present study. The descriptive statistics such as percentage was used for analysis of the educational level, gender and age while the inferential statistics was used to test the hypothesis generated from this study.

3 RESULTS

Table 1 Average mean Scores on the Dimensions of Risky Driving Behaviour

			N=277
	Anxiety Based Performance	**Exaggerated Safety Caution Behaviour**	**Hostile Aggressive Behaviour**

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Mean	19.2014	25.3534	24.5901
Std. Deviation	5.79359	8.68043	5.28226

The pattern of average scores on risky driving behavior shows that the drivers have moderate high scores on anxiety based performance (19.20±5.79), exaggerated safety caution behavior (25.23±8.68) and hostile aggressive behavior (24.59±5.28).

3.1 Test of Hypotheses

The first Hypothesis states that personality traits (openness to experiences, consciousness, extroversion, agreeableness and neuroticism) will significantly jointly predict driving behavior. This was tested using multiple regression analysis for testing composite relationship of the independent variables and the result is shown on table 2.

The results indicated that there was significant joint influence of personality traits on risky driving behaviour: [$F(5,283) = 87.54$, $R^2 = .612$; $p = .005$] with the variables accounting for 61% of the variance in driving behavior. Further results show that extraversion (β=-.45; t= -6.99), agreeableness (β= 41; t = 3.98), conscientiousness (β=.17; t = 3.68), and openness to experience (β=-.27; t= -4.20) significantly predicted driving behavior while neuroticism (β=-.14 t= -1.49) does not significantly predict on driving behavior.

Table 2: Multiple Regression analysis of Joint Influence of Personality Traits on Driving Behavior.

						N=277	
Predictors	**B**	**T**	**P**	**R**	**R^2**	**F**	**p**
Extraversion	-.46	-6.99	< .05				
Agreeableness	.41	3.98	<.05				
Conscientiousness	.17	3.68	< .05	.783	.612	87.54	.005
Neuroticism	-.14	-1.49	>.05				
Openness to experience	-.27	-4.20	<.05				

Further analysis tested the prediction of risky driving behavior based on the three dimensions of risky driving behavior: anxiety based performance, exaggerated safety caution behavior and hostile aggressive behavior. The results are presented in Table 3:

Table 3: The Summary of Multiple Regression Analysis Showing the Influence of Personality Traits on Anxiety Based Performance, Exaggerated Safety Caution Behaviour and Hostile Aggressive Behaviour

							N = 277

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	Anxiety Based Performance			Exaggerated Safety Caution behaviour			Hostile Aggressive Behaviour		
Variables	**B**	**t**	**Sig.**	**B**	**T**	**Sig.**	**β**	**t**	**Sig.**
Extraversion	-.631	-6.784	.000	-.111	-2.182	.030	-.448	-7.396	.000
Agreeableness	.178	1.223	.222	.570	7.172	.000	.045	.475	.635
Conscientiousness	-.030	-.446	.656	.332	9.102	.000	-.015	-.335	.738
Neuroticism	.337	2.509	.013	-.188	-2.557	.011	-.468	-5.356	.000
Openness to experience	-.634	-6.993	.000	-.014	-.276	.782	-.057	-.958	.339
R		.47			.87			.82	
R^2		.22			.76			.67	
F –ratio		15.85			182.05			112.96	

The result of multiple regression analysis as presented in Table 3 shows that extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences jointly predicted anxiety based performance : (R^2 = .22, F (5, 277) = 15.85, *p*= .000; exaggerated safety caution behaviour(R^2 = .76, F (5, 277) = 182.054, *p*= .000; and hostile aggressive behaviour (R^2 = .67, F(5, 277) = 112.96, *p*= .000. The model reveals that 22%, 76% and 67% of variance observed in the dimensions of driving behaviour (anxiety based performance, exaggerated safety caution behaviour and hostile aggressive behavior respectively) among driving behaviour by personality factors (extraversion, agreeableness conscientiousness, neuroticism and openness to experiences).

The results further revealed that extraversion (β = -.63, t= -6.78, *p*=.000), neuroticism β = .34, t= 2.51, *p*= 013) and openness to experiences (β = -.63, t= -.7.00, *p* =.000) independently significantly predicted anxiety based performance. Extraversion (β = -.11, t= -.2.18, *p*= .030), agreeableness (β = .570, t= 7.17, *p*= .000), conscientiousness, (β = .333, t= 9.10, *p*<.000) and neuroticism (β = -.188, t= -2.56, *p*=.011) independently significantly predicted exaggerated safety caution behaviour while extraversion (β = -.45 t= -7.40, *p*=.000), and neuroticism (β = -.47, t= -5.36, *p*=.000) independently significantly predicted hostile aggressive behavior.

The second Hypothesis states that demographic variables (age, sex, marital status, education, religion and years of training) will significantly jointly predict risky driving behavior of the traffic offenders. This was tested using multiple regression analysis for testing composite relationship of the independent variables and the result is shown on Table 4:

The results indicated that there was no significant joint influence of the demographics variable on driving behaviour: [F(7,275) = 1.126, R^2 = .028; p= .399] with the variables accounting for 3% of the

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variance in driving behaviour. Further results show that 3.8% variation of driving behavior is accounted for by the demographic variables.

Table 4: The Summary of a Multiple Regression Table Showing Joint Influence of Demographic Variables on Driving Behavior.

						N=277	
Predictors	**β**	**T**	***p***	**R**	**R^2**	**F**	***p***
Age	.040	.489	> .05				
Sex	.018	.282	>.05				
Marital Status	-.079	-1.088	> .05	.167.	.028	1.126	.399
Religion	-.057	-.877	>.05				
Occupation	.018	.289	>.05				
Educational Level	-.050	-.811	>.05				
Years of Driving	-.141	-1.851	>.05				

4. DISCUSSIONS

The study assessed the role of personality traits and demographic factors in risky driving-behaviour among traffic offenders in Osun State southwestern Nigeria. The result of the first hypothesis was supported. It demonstrated that the dimensions to driving behaviour were predicted by personality traits (extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences). Extraversion, neuroticism and openness to experiences were significant independent predictors of anxiety based performance; extraversion, agreeableness, conscientiousness, and neuroticism predictors of exaggerated safety caution behaviour while extraversion and neuroticism predicted hostile aggressive behaviour. The findings supported the perspective of Alavi, Mohammadi, Souri, Kalhori, Jannatifard and Sepahbodi [18] that neuroticism alone can increase the odds of road accidents by 1.1-fold, but other personality traits did not have a significant effect on the equation.

The results further indicated that there was no significant joint influence of the demographics variable (age, sex, marital status, education, religion and years of training) on driving. This research finding is in contrast with several studies which demonstrated significant association with anger and risky driving behaviour. The reason for this difference could be resultant from the combination of the demographic variables used. Several studies have examined personality factors and situational correlates of driving anger and aggression. In reference to personality factors, younger age and male gender have been associated with greater likelihood of engaging in aggressive driving behavior [19, 20].

5. CONCLUSIONS AND RECOMMENDATIONS

The results indicated that there was significant joint influence of personality traits on risky driving behaviour. Extraversion, agreeableness, conscientiousness and openness to experience are

significant independent predictors of driving. Extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences are joint predictors of anxiety based performance, exaggerated safety caution behaviour and hostile aggressive behaviour.

Extraversion, neuroticism and openness to experiences are significant independent predictors of anxiety based performance. Extraversion, agreeableness, conscientiousness, and neuroticism are significant independent predictors of exaggerated safety caution behaviour while extraversion and neuroticism are significant independent predictors of hostile aggressive behavior. Finally the identified demographics variables failed to jointly predict driving behaviour among the participants.

There should be an enlightenment programs for road users in other not to drive or ride motorbikes in a reckless manner. Road users should also abide by the rules and regulations governing transportation. Psychological assessment of all applicants should be done by Federal Road Safety Corps (FRSC), before issuance of diving license.

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