



SENZATION SEEKING AND VIOLATION OF TRAFFIC RULES PREDICTORS FOR DRIVING PERFORMANCE

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Abstract

The objectives and hypotheses are focused on evidencing how the sensation seeking factors and violation of traffic rules predict the driving performance. Method: The participants were 40 drivers aged between 25 and 50 years old, the driver license minimum 5 years from Bucharest. Instruments: The Arnett Inventory of Sensation Seeking (Arnett, 1994), the Manchester Driving Behavior Questionnaire (Reason, Manstead, Stradling, Baxter & Campbell, 1990) and the number of small accidents, traffic errors and warnings. Results and Conclusions: The assumptions of the present study have been partially confirmed. Hence, violation of rules predicts the traffic errors, the intensity as dimension of sensation seeking predicts small accidents in traffic and the violation of rules dimension predict the traffic warnings ($p < .05$). Further studies shall investigate the gender differences in sensation seeking novelty and intensity and violation of speed limits. Also, the driver population research sample should be enlarged.

Keywords: *sensation seeking, driving behavior, rule violation, traffic errors.*

1. INTRODUCTION

Jain, Kontogiannis, Kossiavelou & Marmaras (2002) conducted a study focused on evidencing the driving performance predicted by errors, speed convictions and violations. The authors were interested to analyze driving performance variables in the way of accidents predicted by aberrant driving behavior. Hence, they presented in their study the aberrant driving behavior from the perspective of errors, convictions and violations. Hence, they identified three types of violations: highway code, aggressive driving behavior and situational violations. They find out that tendency to commit highway-code violations predict accident liability and aggressive violations were statistically significant correlated with speed involvement convictions and law-breaking.

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Arnett (1994) page 291 presents a correlation table between novelty and intensity as scales of the sensation seeking scale and risky behavior in traffic with the dimensions: driving over the speed limit, car racing, vandalism and others. The internal consistency coefficients were between .81 and .87.

Zuckerman & Aluja (2014) were interested to investigate the measures of sensation seeking. In this book chapter, the authors cited previous studies of Zuckerman highlighting that the high and low scores of the sensation seeking scale depend on genetic, biochemical, physiological and neurological individual differences. In this way Zuckerman (2005, 2007, 2008a, 2008b, 2011) cited by Zuckerman & Aluja (2014) developed the biosocial theory of sensation seeking as part of the personality construct.

Either Arnett (1994) or Zuckerman & Aluja (2014) underline the importance of the Sensation Seeking Scale of Zuckerman (1964) and present references in their studies about this scale. The Sensation Seeking Scale developed by Zuckerman (1964) consists of 40 items and is structured on the following dimensions: Thrill and Adventure Seeking, Experience Seeking, Disinhibition and Boredom Susceptibility.

Amirfakhraei, Taghinejad & Sadeghifar (2013) were interested to investigate the relationship between risky driving behavior and sensation – seeking. The sample was a number of 200 students from Islamic Azad University. The authors applied the Manchester Driving Behaviour scale and the Zuckerman Sensation Seeking scale due to evidence the relationship between the variables. Hence, the findings highlighted that total score of sensation-seeking correlate statistically significant with the total score of the driving behavior scale. Also, the authors evidence that the sensation seeking factors correlate statistically significant with the driving behavior total score. Furthermore, the authors find out the significant correlations between the traffic violation and traffic speed.

Zahra, Neda, Mehran & Mohammad (2017) conducted a study focused on the relationship between the sensation-seeking and dangerous driving behaviors in Iran. The findings highlighted that the sensation seeking factors measure with the Sensation Seeking Scale developed by Zuckerman (1964) predicted dangerous driving behaviors measured with the Manchester Driver Behavior Questionnaire. Furthermore, the authors evidence a statistically significant correlation between the adventure-seeking, boredom susceptibility and dangerous driving behaviors.

Zhang, Fu & Guo (2011) were interested to evidence the relationship between the risk attitude, perception, behavior, personality and driving risk awareness in China. The participants were 196 drivers and completed paper pencil the Risk Attitude Scale (mixed item from research questionnaires), Risk Perception Scale (mixed item from research questionnaires), Risk Behavior Scale (mixed item from research questionnaires) and Sensation Seeking Scale - Chinese version translated by Chunxing (1994). The authors calculate all the psychometric indicators,

factorial analysis and provide a model of “Sensation seeking as an indicator of a driver’s risk awareness” (Zhang, Fu & Guo, 2011, page 10).

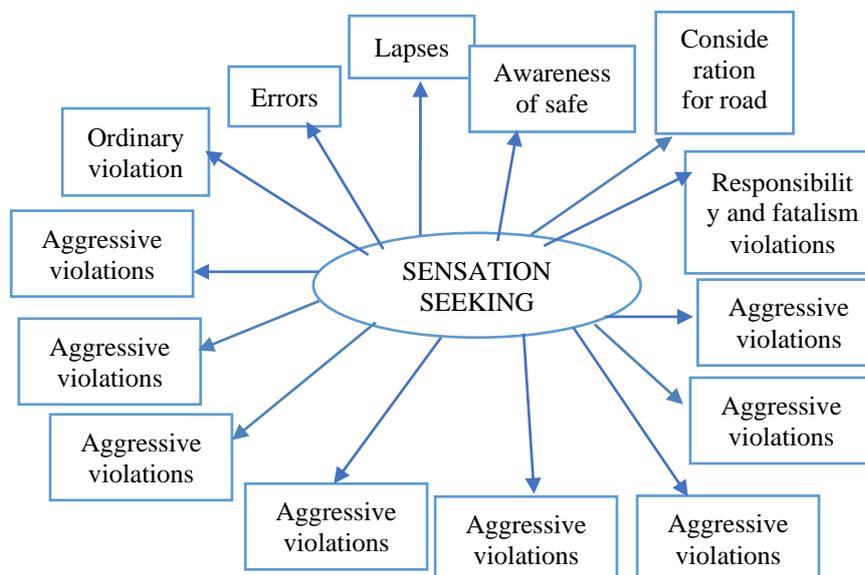


Figure 1 The model of “Sensation seeking as an indicator of a driver’s risk awareness” (Zhang, Fu & Guo, 2011, page 10).

Sârbescu (2013) conducted a study investigating the psychometric properties of the Manchester Driver Behaviour Questionnaire on 200 participants, Romanian sample.

Yilmaz & Celik (2006) investigated the risky driving attitudes and traffic violations on a sample of 600 individuals driving different types of vehicles in Eskişehir-Turkey. The authors selected risky driver attitudes in traffic: the recklessness attitudes towards traffic safety, and risk behavior questionnaire by Ulleberg & Rundmo (2003) and the driver’s behavior developed by Reason et al. (1990). The findings evidenced that the fourth hypotheses confirmed and using the factor analysis, the path model explained 82% of the total variation taking in analyze the risky driver attitudes variable. Hence, the risky driver attitude is related with the variables: obedience to speed rules, caring about traffic accidents, risk taking tendency and violations of rules.

Iversen (2004) conducted a study regarding the relationship between risk-taking attitudes and risky driving behavior. The sample consists in a number of 1604 of drivers. The findings confirmed the hypotheses and evidenced that the

assuming the risk variable is related with the accidents and crashes occurred while driving after risk assuming.

2. OBJECTIVE AND HYPOTHESES

2.1. OBJECTIVE

The general objective of the research is focused on highlighting the fact that violation of the rules and sensation seeking are predictors of the small accidents, traffic warnings and traffic errors.

2.2. HYPOTHESES

The hypotheses are testing the bivariate correlation and also the prediction.

The general hypothesis of the study evidence that sensation seeking and rule violation are predictors for small accidents, traffic errors and traffic warnings.

The hypotheses of the study are the followings:

1. We assume that there is a statistically significant correlation between the novelty as sensation seeking dimension and traffic errors.
2. We assume the novelty as dimension of sensation seeking is predictor for traffic warnings.
3. We assume the intensity as dimension of sensation seeking is predictor for the number of the small accidents in traffic.
4. We assume that the violation of the rules is predictor for the traffic errors.
5. We assume that the violation of the rules is predictor for small accidents.
6. We assume that violation of the rules is predictor for traffic warnings.

3. METHOD

3.1. THE PARTICIPANTS

The participants were a number of 40 drivers with minimum 5 years of experience, age between 25 and 50 years old, Bucharest Romania.

3.2. THE INSTRUMENTS

The Arnett Inventory of Sensation Seeking assesses the sensation seeking traits of personality (Arnett, 1994). The two dimensions of the inventory indicate the risk preferences highlighted by the 20 items. As the author evidenced in this inventory, sensation seeking is defined as a need for novel and intense stimulation

(Arnett, 1994). The AISS inventory is structured on items using a scale in four points from 1 to 4 and the internal consistency coefficients were between .81 and .87.

Manchester Driving Behavior Questionnaire (Reason, Manstead, Stradling, Baxter & Campbell, 1990) is designed on two dimensions: rule violation and errors from a point-scale from 1 to 6. In the present study the Canadian version was applied. Wählberg, Dorn & Kline (2011) highlighted in their study that the questionnaire has start point in the error theory of Reason (Reason, 1987; Reason, Manstead, Stradling, Baxter & Campbell, 1990) cited by Wählberg, Dorn & Kline (2011) and also the measures of the aberrant driving behaviours quantified as errors, lapses and rules violations). From MDBQ questionnaire was applied only the rule violation scale.

The driving performance questionnaire with 3 items: number of small accidents, traffic errors and warnings.

3.3. PROCEDURE

The instruments were applied paper and pencil respecting the anonymity, ethics in research and the GDPR legislation was respected. The instruments were applied between 14 and 18 PM in different location, most of the participants were undergraduate and master students.

3.4. THE DESIGN

Testing the hypothesis with the regression model the variables are:

1. Independent variables: novelty and intensity as dimension for the sensation seeking and the rule violation for the driving behaviour,
2. Dependent variables: number of small accidents, number of traffic warnings and number of traffic errors.

4. RESULTS

The first hypothesis of the study was tested using the Pearson bivariate correlation statistical test. Hence, there is a statistically significant bivariate correlation between the novelty as sensation seeking personality trait and traffic errors as measure of driving performance ($r = -.522$; $p < .01$).

Testing the second hypothesis regarding the novelty (dimension of sensation seeking) is predictor for traffic warnings, the simple regression model has been applied. According to the results, the hypothesis has not been confirmed.

The third hypothesis “We assume the intensity as dimension of sensation seeking is predictor for the number of the small accidents in traffic” has been tested and the results can be seen in table 1.

In the table 1 can be seen the Constant, the Unstandardized Coefficients and the Standardized Coefficients of the regression model.

Table 1 – Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	40.239	8.473		4.749	.000
	Intensity-sensation seeking	.486	.223	.334	2.182	.035

a. Dependent Variable: Small accidents

Small accidents =40.239+.486* Intensity-sensation seeking

Also, the values for R and R Squared are the followings: R= .334 and R Squared=.111.

The fourth hypothesis of the study “We assume that the violation of the rules is predictor for the traffic errors.” has been has been tested using the simple regression model. The results can be seen in the table 2.

Table 2– Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.728	.757		7.563	.000
	Violation of the rules	.330	.072	.597	4.585	.000

a. Dependent Variable: Traffic errors

The regression equation according table 2 is the following (confirmed hypothesis at threshold $p < .01$):

Traffic errors =5.728+.330* Violation of the rules

For testing the fifth hypothesis of the study “We assume that the violation of the rules is predictor for small accidents” the linear regression model has been applied.

In table 3 can be seen the Constant, the Unstandardized Coefficient and the Standardized Coefficients values.

Table 3– Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	53.201	1.752		30.368	.000
	Violation of the rules	.542	.166	.467	3.258	.002

a. Dependent Variable: Small accidents

According the table 3 the regression equation is the following confirmed hypothesis at threshold $p < .01$):

Small accidents = $53.201 + .542 * \text{Violation of the rules}$

The values for R and R Squared are the followings: $R = .467$ and $R \text{ Squared} = .467$.

Testing the sixth hypothesis with the simple linear regression model “We assume that violation of the rules is predictor for traffic warnings”, the results can be seen in the table 4.

Table 4– Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	56.839	1.713		33.180	.000
	Violation of the rules	.410	.163	.379	2.521	.016

a. Dependent Variable: Traffic warnings

According the table 4 the regression equation is the following:

Traffic warnings = $56.839 + .410 * \text{Violation of the rules}$

Hence, the hypothesis has been confirmed ($p < .05$).

5. CONCLUSIONS

The results evidenced that testing the first hypothesis the novelty as sensation seeking personality trait correlate statistically significant negative with the number of traffic errors as measure of driving performance ($r = -.522$; $p < .01$).

These findings explain that a high level of novelty as sensation seeking correlate with small number of traffic errors. Also, the novelty doesn't predict the number of traffic warnings (the second hypothesis was not confirmed). Regarding the intensity as dimension of sensation seeking the hypothesis has been confirmed statistically significant that predicts in a positive way the number of the small accidents in traffic. Reading the items of the intensity dimension of the sensation seeking can be observed that the high level of the implications in assuming risk actions predict high number accidents in traffic. Also, the violation of the rules predicts statistically significant the number of the traffic errors, small accidents and traffic warnings ($p < .05$). The scientific literature supports the results (Amirfakhraei, Taghinejad & Sadeghifar, 2013; Erke, 2009; Goldenbeld, 2017; Klauer, Guo, Simons-Morton, Ouimet, Lee & Dingus, 2014; Reason et al. 1990; Rizeanu, Gatej, Ciolacu, 2017; Yilmaz & Celik, 2006). Further studies should investigate the relation between the speed limit violation and the sensation seeking, and traffic performance.

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