

ASSESSING THE IMPACT OF STRESS AND PERSONALITY IN AGGRESSIVE DRIVING BEHAVIOR IN THE GREEK POPULATION

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ABSTRACT

Aggressive driving is a major contributory factor of traffic crashes. There is a lack of scientific evidence on the relationship between stress, personality and aggressive behavior while driving and young drivers' involvement in car crashes. In addition there is inadequate research evidence on the personality profile of the aggressive driver worldwide. In the present study 272 questionnaires were completed by male and female drivers in order to examine the impact of stress and personality in driving. Analyses showed that the driver's perceived stress is associated with the demonstration of higher frequency of aggressive driving behaviors ($p < 0,01$), while there also seems to be a statistically significant negative correlation between conscientiousness and aggressive driving ($p < 0, 01$). Additionally neuroticism is associated with aggressive driving ($p < 0,01$). Secondary measurements showed that drivers with the most frequent risk- related driving behaviors are men and especially motorcycle drivers. Age and socioeconomic status do not seem to have a differentiating effect on aggressive driving. Further research directions and implications are discussed in order to promote safety in driving behavior.

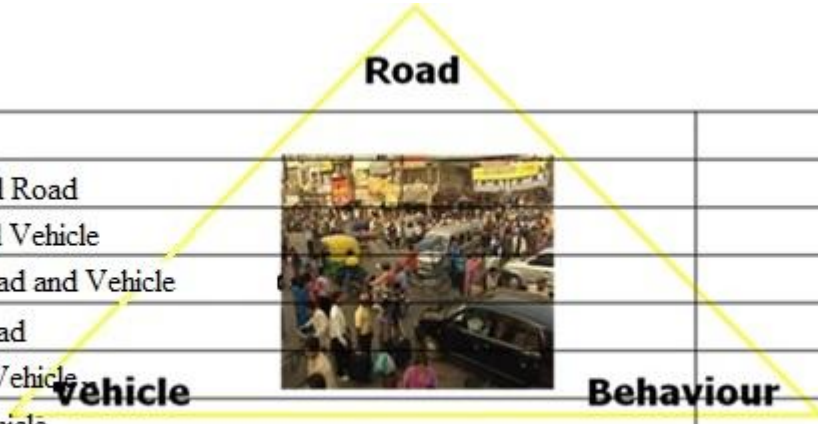
Keywords: aggressive driving, driving with anger, stress, stressful life events, aggression, personality and driving behavior, traffic violations

.Introduction

According to official European data, Greece holds a sad preeminence in car crashes in Europe with 116 deaths per million inhabitants, while the EU average is 62 and countries like Sweden and the UK have around 25 to 30 deaths / million population every year. Young drivers seem to be most at risk as traffic incidents are **the 1st cause of death for ages 15 to 29, the 2nd cause of death for ages 5-14 and the 3rd cause of death for ages 30-44.** [1]. According to the Hellenic Police's data the main causes of accidents are **excessive speeding, disobedience of the double white lines, careless and reckless driving, disobedience of other driver's priority, distractive driving, performance of an illegal overtake, alcohol consumption and factors related to the driver, such as fatigue and stress.** [2]

The driver's stress appears to be a factor that affects both its psychosomatic condition and driving behavior [3]. Low levels of stress are associated with increased concentration and alertness in situations of potential danger. However high stress has the opposite effect as it creates problems in cognitive processes such as attention , perception and decision-making [4]. Driving is a highly stressful activity as the driver experiences situations that constantly trigger stress. Since driving is a complex activity, stress may influence the judgment of the driver and lead to wrong decisions, impulsive and potentially delinquent and dangerous driving behaviors. Improper handling of the vehicle and traffic offenses increase the risk of being involved in traffic incidents [5,6,7]. According to contemporary studies the drivers who had experienced stressful life events were under increased risk of getting involved in traffic incidents [8-13]. Folley and Waller (1972) found that crash victims had been under serious stress before the road incidence and also Kasper, Moffat et al.investigations revealed tha most drivers involved in fatal traffic accidents had experienced very stressful life events the previous twelve months. [14]. According to Mc Murray divorced people were reported to have had twice the expected number of car crashes during the past six months before and after divorce [15].

Table 2. The factors that are responsible for road traffic incidents events



Human		65%
Human and Road		24%
Human and Vehicle		4,50%
Human, Road and Vehicle		1,25%
Just the Road		2,50%
Road and Vehicle		0,25%
Just the Vehicle		2,50%
TOTAL		100%

In all cases, the human factor shares responsibility on issues relating to the prevention and reduction of traffic incidents. There are 4 categories of human factors which are associated with the high frequency of traffic incidents: 1) skills, 2) experience, 3) individual age and educational level and 4) social status and lifestyle [16]. It could be said that lifestyle, personality and demographic characteristics of the person determine driving behavior [17,18].

Greek drivers have been characterized amongst the most dangerous and delinquent as they adopt an aggressive driving style instead of a defensive driving style. In a study conducted in 2009 by the Road Safety Institute (R.S.I.) "Panos Mylonas" in collaboration with TNS and that took place simultaneously in 12 other countries, 60% of Greek people reported having experienced aggressive driving behavior towards them [19] while this phenomenon in the recent years has escalated with everyday fights and even murders on the streets. There are some characteristic examples where disagreements between unknown drivers reached a personal level and led to serious injuries and even deaths.[20]. In the same research **51%** of the drivers stated that other drivers have aggressively used their flashing lights, **50%** have been insulted by aggressive or provocative gestures, **47%** have experienced a deliberate action from other drivers of blocking the road, **22%** say that someone was aggressively "stuck"- tailgaiting behind his/her car while **9%**, the biggest percentage within **Europe**, admitted that he/she has been attacked or that physical attack against them has been attempted [19]. Young male drivers (aged 18-26) frequently exhibit an aggressive driving behavior while men over 55 years appear to be more reticent while driving [19].

It has to be mentioned though that all drivers regardless of gender, age and educational level may exhibit aggressive driving behavior if they were in certain psychological and environmental conditions. The U.S. National Highway Traffic Administration (NHTSA) defines aggressive driving as illegal driving action including: speeding, dangerous driving maneuvers, the "obstruction" of other vehicles movement, frequent lane changes, the unnecessary use of the emergency lane, driving too close to the vehicle ahead in order to make an overtake and the harassment of another driver [21]. Other aggressive driving behaviors that indicate rudeness include the excessive use of horn in order to express annoyance, the "flashing of headlights", gestures and verbal insults. As aggressive driving is one of the most common violations of the Highway Code and increases the likelihood of involvement in traffic incidents [22,23], it is necessary to detect the factors that contribute to its rapid growth.

One of the most common examples in order to perform an assessment of the determinant factors which separate the pre-crash, during crash and post-crash actions is the so-called "matrix of Haddon" as it was presented on Table 1. This matrix was created by William Haddon in order to implement prevention of traffic incidents programmes [24]. As shown in the table below, the psychosomatic condition of the person and his personality is crucial in order to prevent future traffic incidents.

Road traffic incidents are caused by a number of risk factors which can be classified into three major categories: human behavior, vehicle and infrastructure (roads). Without doubt the greatest responsibility lies with the person as he seem to be culpable for the 95% of road incidents [25].

In a survey that was conducted by the Massachusetts Institute of Technology (MIT) on stress, the participants were exposed to traffic conditions and their stress results came out to be as much as the stress of people who perform "extreme sports"! Traffic congestion is a phenomenon that is often observed in towns and is one of the main factors contributing to stress. Remaining in the car in very low speeds is very stressful for the body. Also the congestion on main roads with numerous vehicles leads to inhalation of large quantities of pollutants with long-term effects on the respiratory system of the drivers. The joints, the waist, the back, the wrists and the neck of the driver are burdened through the frequent rotation between acceleration and braking. Traffic jams on the roads of the big cities have also a big economic impact resulting in higher fuel consumption. On the other hand, the violent accelerations after a standstill or the casual motion of the vehicle result

in tyre wear and stress on the mechanical parts of the vehicle. Sudden braking causes premature wear on the brake pads and increases the likelihood of the driver losing control of the vehicle.

Additionally, the traffic has been associated with problems at work as it leads to delays, postponements and lost work hours. Moreover, the inability to determine the time of arrival at a destination but also the waiting in a non-moving vehicle for long periods of time creates confusion and frustration in the driver. There is research evidence that shows that peak hours and increased traffic make drivers more prone to aggressive behavior and violations of traffic regulations [26]. It is a fact that the intensity the driver experiences on the roadway while he is immobilized and he is in a hurry, make him feel at the same time that he can not control his movement and results in an increase of aggressive behavior!

Another factor that seems to cause stress and increase aggressive driving phenomena is rudeness. Rudeness among drivers is frequent and is a key element that characterizes aggressive driving. The isolation and the lack of communication while driving leaves no space for personal explanations for any negative driving behavior. Driving is a complex process that requires more responsibility which causes even more fatigue and stress. According to Howard A. and Joint M. several contributors to driver stress can include worry and emotional stress, related to life events and road rage. [27]. Feelings that we can not process properly under stressful occasions resulting in us being more aggressive with others. Unforeseen events and incidents happen all the time during driving and prove to be extremely stressful for the driver. Our body recognizes unforeseen events as imminent danger and responds to this fact by producing more stress hormones such as cortisol and the hormone ACTH. Chronic response of our body to stressful life events is associated with behavioral, metabolic and pathological diseases. [28].

People who experience extreme stress when driving either quit driving or they continue to drive and develop certain phobias. Stress makes a person more irritable and contributes to the adoption of aggressive behavior, however, the degree of impact varies as some are affected to a greater extent while others appear more resistant.

We cannot therefore ignore the importance of personality in relation to the vulnerability of the person especially concerning the stress response and the likelihood of aggressive driving. The assessment therefore of personality in relation to stress and aggressive driving is essential. There is

evidence showing that personality of drivers can be used as a factor to predict one's likelihood of involvement in traffic incidents [29] especially when the characteristics of the personality of the driver include aggression [30] and irritability [31]. El. Chliaoutakis, Demakakos and al. (2002) investigations indicated that driving just for fun (joyriding) and irritability were predictors of young drivers' involvement in car crashes [32]

In the Pauline Gulliver and Dorothy Begg research in 2007, participants with high levels of aggression were committing risky driving behaviors more often [33]. In the Bahram Esmaeili, Hamid Reza and Imani Far research, the personality factors that could predict the fines that one had got for traffic offenses were extraversion and aggression while an inverse relationship with conscientiousness was shown[34]. The more aggressive and extroverted the participants were, the more increased the probability was for them to act with delinquent behaviors and get fined. It was shown though that the more conscientious a driver was the more reduced this possibility of delinquent behavior was. Numerous other studies underline the importance of studying the personality when assessing an aggressive driver [35,36,37]. Türker Özkan, Timo Lajunen, Joannes El Chliaoutakis et al. also conducted a research to investigate the effect of three factors (aggressive violations, ordinary violations and errors) based on the Manchester Driver Behaviour Questionnaire (DBQ) and they compare these driving behaviours across the six countries. Futhermore, they evaluated the role of driving styles between different cultures and the number of traffic accidents. Results demonstrated that driving style mediates the relationship between traffic culture and the number of accidents and the importance of driver characteristics and behaviors in predicting the number of traffic accidents. [38]

AIM OF THE STUDY

The aim of the study is to assess the impact of perceived stress and the role of personality factors in driving behavior and the involvement in car crashes. The upper goal of the following research is the deeper understanding of the factors and that effect driver's behavior and to detect the personality characteristics of dangerous drivers. The determination of the factors that trigger the expression of aggressive driving behaviors are essential to develop effective educational programs in order to prevent and reduce road incidents.

RESEARCH HYPOTHESES

- 1) Given that the statistics highlight the Greek drivers as aggressive, we expect in our sample a high self-report of aggressive driving behaviors.
- 2) A positive correlation is expected between the perceived stress of the drivers and the frequency of self-report aggressive driving behavior.
- 3) In relation to gender we expect a higher incidence of aggressive driving behaviors in men. Furthermore we expect a negative correlation between educational level and aggressive driving. In addition we expect participants from lower socioeconomic backgrounds to exhibit aggressive driving behavior more often, as according to statistics their perceived stress is in higher levels.
- 4) Finally we expect specific personality characteristics such as extraversion and conscientiousness to correlate to aggressive driving.

METHOD

The research was carried out in a sample of 272 drivers aged 19-59 from Athens and other Greek cities. Of these, 53.5 % were male and 46.5 % female. The mean age was $M = 25.77$ years and the standard deviation $SD = 7.82$. Regarding their marital status 83.10 % were single, 14% married and 2.9 % divorced or widowed. In relation to their educational level 1.10 % were primary school graduates, 1.8 % secondary school graduates, 34.20 % high school graduates, 25.4 % technical school graduates, 32 % university graduates, 4 % Master's program graduates and 1.5% were holders of a PhD. A rate of 47.8 % of the sample reported that they worked while 52.2 % reported being unemployed. The average annual household income of the sample was 12,358,87 euro and the standard deviation of $SD=6,129,38$ euro. Of the participants in the sample 82 % drove a car, 8.5% a motorcycle, while 8.10 % stated that they drive both a car and a motorcycle. Regarding the years of driving experience a rate of 22.5 % of the sample had 1-2 years of experience, 34.1 % had 3-5 years of experience, 24.7 % had 6-8 years of experience and 18.7 % had more than 8 years of experience. Finally in relation to having participated in a road incident 41% said YES and 59 % said NO. Of these traffic incidents, 69 % were without any injury, 25.7 % involved the injury of a person, and 5.3% the injury two or more people.

TOOLS

Perceived Stress Scale (PSS): The PSS is a self-report scale, implementing fourteen points that estimate whether the situations in one's life are considered stressful. The scale is *validated in Greek*. Individuals who complete the questionnaire indicate their frequency of emotions and thoughts during the last month, on a five-level Likert scale (from 0 = never to 4 = very often). There are seven positive and seven negative items and the total score is the sum of each score of all positive points after the reversal (minimum score = 0, maximum total score = 56). Higher scores indicate high perceived stress of the individual during last month. The test's reliability was $\alpha=0.85$.

The Driver Behaviour Questionnaire (DBQ): Manchester Driver Behaviour Questionnaire (Lawton et al.,1997; Parker et al., 1998).

Participants were asked to indicate how often they perform each of the list's violations and

mistakes while driving. The answers lie in a scale of six points from "never" to "almost always". 1 = Never 2 = Almost never 3 = Sometimes 4 = Often 5 = Quite often 6 = Almost always.

Eysenck Personality Questionnaire (EPQ). The EPQ is a questionnaire that is used to evaluate the person's personality. It was created by Hans Jürgen Eysenck and his wife Sybil B. G. Eysenck and is based in the doctrine of the five temperaments: extraversion, neuroticism, conscientiousness, agreeableness and openness.

PROCEDURE

The data was collected by the researchers by administering questionnaires in various areas of Athens and the region. More specifically, the study included people from Athens, Patras, Agrinio, Evia and military personnel from across the country. Participants were informed that the investigation related to driving behavior. Completed questionnaires were returned to the researcher within three days.

The costs that arose from the study were covered by the researchers and did not burden the participants. All personal information and data collected remained confidential. Test completion was anonymous.

RESULTS

Results were estimated with the use of statistical software SPSS 18.0.

Originally the averages and the standard deviations for key variables of research (dangerous driving, stress and personality) were calculated. The results are listed in the following table.

TABLE 4
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
StressTotal	272	17,00	69,00	48,8713	11,53
Dbqtotal	267	25,00	80,00	48,3745	11,460

Extraversion	263	14,00	36,00	25,79	3,77
Agreeableness	270	15,00	41,00	29,70	4,61
Conscientiousness	270	15,00	45,00	32,29	5,13
Neuroticism	271	9,00	38,00	23,44	6,08
Openness	265	18,00	49,00	34,07	5,48
Valid N (listwise)	256				

Then an analysis per question was implemented in order to indicate the distribution of the sample regarding dangerous driving behaviors based on the DBQ. In particular as far as the attempted effort to overtake from the right side due to slow movement of the leading car a rate of 5.5 % of the participants said they do it very often as a common practice, 14.7% that they do it quite often and 30.9% that they do it sometimes. Cumulatively it is shown that a proportion of 51.1 %, which is the majority of the sample, shows this specific behavior which also constitutes a breach of the Highway Code. The rate is quite high, especially considering the relevance of the specific driving behavior with the road incidents.

Regarding the usage of the horn in order for the driver to indicate his/her annoyance towards the other driver's behavior, a rate of 32.4% reported that they occasionally do this , 11.4% that they do this often and and 2.9% that is a 'very often' practice. A cumulative percentage of 46.7% express their impatience using the horn with a range of "often" to "very often". This behavior may not be directly related to traffic incidents but is nevertheless indicative of indignant behavior on the part of the driver and can be connected with other delinquent behavior.

In general it seems that risky and delinquent behavior exists in a percentage ranging from 30% -50% in all items of the DBQ. In reference to the first research hypothesis it appears that there is indeed a high self-report of aggressive driving behaviors.

Regarding the 2nd research question as to the correlation of perceived stress with aggressive behavior, we used the Pearson r index. Based on the analysis, a moderate to high positive correlation was shown between stress and aggressive driving, statistically significant at a level of $p < 0,01$ ($r = +0,432$). The interpretation that can be given is that the pressure - stress of the driver creates the conditions for manifestation of the driver's aggressive driving. Aggressive driving can be manifested either as a form of reaction to the sources that cause pressure (eg limited time, hurry

to arrive at his/her destination) or as a defuse towards the symptoms of stress. However, there is possibly also an inverse relationship, meaning that the aggressive driving creates additional stress to the driver as he/she is endangering his/her physical safety, his/her vehicle and the others. More information on this finding will be listed in the closing discussion.

Regarding the 3rd research hypothesis as to whether gender, income, age and education level affect the levels of stress and aggressive driving, an analysis of variance (ANOVA) was implemented whose results are listed below:

TABLE 5

		Descriptive statistics							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Dbqtotal	Man	142	50,19	11,27	,9458	48,32	52,06	25,00	76,00
	Woman	124	46,29	11,41	1,02	44,26	48,32	27,00	80,00
	Total	266	48,37	11,48	,703	46,98	49,76	25,00	80,00
Stress Total	Man	145	50,24	11,02	,91	48,43	52,05	17,00	69,00
	Woman	126	47,17	11,90	1,06	45,07	49,27	19,00	69,00
	Total	271	48,81	11,52	,70	47,44	50,19	17,00	69,00

TABLE 6

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Dbqtotal	Between Groups	1002,58	1	1002,58	7,80	,006
	Within Groups	33931,82	264	128,53		
	Total	34934,40	265			
StressTotal	Between Groups	636,919	1	636,91	4,86	,028
	Within Groups	35209,22	269	130,88		
	Total	35846,14	270			

Specifically with regard to gender, the analysis showed that women experience a greater degree of stress than men. The difference is statistically significant at $p < 0,05$. However regarding aggressive driving, our research confirms what previous research indicates, that men drive more aggressively than women at the level of statistical significance $p < 0,01$. The interpretation that can

be given for this fact is that men due to the social construction of gender roles may exhibit more aggressive driving behavior based on the existing standards of masculinity (speed, competition, strength, etc.) and vice versa . More information on this finding are listed in the closing discussion.

With concern to age we divided our sample into 4 age categories: 18-26 years old, 27-35 years old, 36-45 years old and 46 years old and up. The results of the analysis of variance regarding the levels of stress and aggressive driving of each age group are listed below:

TABLE 7

		Descriptive statistics							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Dbqtotal	18-26	191	48,93	12,08	,87	47,20	50,65	27,00	80,00
	27-35	46	47,00	10,83	1,59	43,78	50,21	25,00	72,00
	36-45	17	47,11	7,76	1,88	43,12	51,10	34,00	65,00
	46+	10	47,20	7,33	2,31	41,95	52,44	41,00	62,00
	Total	264	48,41	11,48	,706	47,02	49,80	25,00	80,00
StressTotal	18-26	193	48,21	12,64	,909	46,41	50,00	17,00	69,00
	27-35	47	50,14	8,47	1,23	47,66	52,63	28,00	64,00
	36-45	18	51,61	3,74	,88	49,74	53,47	45,00	58,00
	46+	11	52,36	4,80	1,44	49,13	55,58	46,00	59,00
	Total	269	48,94	11,40	,69	47,57	50,31	17,00	69,00

TABLE 8

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Dbqtotal	Between Groups	186,51	3	62,17	,469	,704
	Within Groups	34495,48	260	132,67		
	Total	34681,99	263			
StressTotal	Between Groups	428,20	3	142,73	1,098	,351
	Within Groups	34453,07	265	130,01		
	Total	34881,27	268			

The results of the ANOVA showed that both stress and aggressive driving do not differ significantly in terms of age category. There is an undifferentiated effect on the appearance of stress

and aggressive driving regardless of age. This finding is consistent with the contemporary literature in which it appears that aggressive driving is more a result of education and personality rather than a characteristic of a specific age.

Moreover, the effect of educational level on aggressive driving and stress was assessed. We can observe the results that are listed in the following tables:

TABLE 9

		Descriptives							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Dbqtotal	Primary school	3	48,00	7,00	4,041	30,6110	65,38	43,00	56,00
	Secondary school	5	53,80	5,93	2,65	46,4333	61,16	48,00	63,00
	Highschool	91	48,95	11,48	1,20	46,5635	51,34	25,00	74,00
	Technical school	68	49,55	10,99	1,33	46,8966	52,22	30,00	80,00
	Univarsity	85	46,02	11,65	1,26	43,5086	48,53	26,00	76,00
	Master / MSc.	11	52,54	14,96	4,51	42,4891	62,60	35,00	79,00
	PhD	4	47,00	6,0553	3,02	37,3647	56,63	41,00	55,00
	Total	267	48,37	11,46	,70	46,9936	49,75	25,00	80,00
StressTotal	Primary school	3	52,66	3,21	1,85	44,6813	60,65	49,00	55,00
	Secondary school	5	57,60	6,22	2,785	49,8657	65,33	47,00	63,00
	Highschool	93	50,61	8,94	,92	48,7716	52,45	28,00	63,00
	Technical school	69	45,66	13,74	1,65	42,3652	48,96	17,00	65,00
	Univarsity	87	48,24	12,185	1,30	45,6443	50,83	17,00	69,00
	Master / MSc.	11	53,54	10,40	3,13	46,5550	60,53	27,00	69,00
	PhD	4	50,75	6,23	3,11	40,8234	60,67	45,00	59,00
	Total	272	48,87	11,53	,69	47,4946	50,24	17,00	69,00

TABLE 10

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
dbqtotal	Between Groups	942,47	6	157,08	1,201	,306
	Within Groups	33992,06	260	130,73		
	Total	34934,54	266			
StressTotal	Between Groups	1703,82	6	283,97	2,191	,044
	Within Groups	34342,67	265	129,59		

The results showed that stress is affected by educational level. The post hoc analysis showed that higher stress levels are experienced by primary school and secondary school graduates, apparently for financial reasons and contrary to all the other educational levels of the sample. Among high school graduates and graduates of higher levels of education there was no difference in stress levels experienced. It has to be underlined that regarding aggressive driving, there were no statistically significant differences. It appears that aggressive driving is a characteristic that appears regardless of the educational level of the person.

Also regarding the 3rd research hypothesis, the effect of socioeconomic level did not appear as a differentiating factor on the extent of aggressive driving.

Specifically, the correlation between income and aggressive driving is almost zero while the correlation between income and stress is also insignificant. One explanation for this result may be that persons coming from higher socioeconomic backgrounds drive faster engine cars and / or sports cars and are often characterised by a predisposition for aggressive driving. More explanation shall be given in the closing discussion.

Finally, in the frame of this study, an analysis was carried out regarding the influence of the factors of personality on stress and aggressive driving (4th Hypothesis). The results are listed below:

TABLE 11

Correlation of personality to stress and aggressive driving

		dbqtotal	StressTotal
Extraversion	Pearson Correlation	,048	,043
	Sig. (2-tailed)	,443	,484
	N	259	263
Agreeableness	Pearson Correlation	-,054	-,105
	Sig. (2-tailed)	,380	,085
	N	265	270
Conscientiousness	Pearson Correlation	-,262**	-,303**
	Sig. (2-tailed)	,000	,000
	N	265	270
Neuroticism	Pearson Correlation	,267**	,509**

	Sig. (2-tailed)	,000	,000
	N	266	271
	Pearson Correlation	-,098	-,088
Openess	Sig. (2-tailed)	,115	,153
	N	261	265

According to the results of the analysis it seems that there is a statistically significant negative correlation ($r=-0,262$ / $p<0,01$) between conscientiousness and aggressive driving, and a statistically significant positive correlation between neuroticism and aggressive driving ($r=0,267$ / $p<0,01$). Practically this means that drivers who exhibit an aggressive driving behavior have increased neuroticism and decreased conscientiousness. This finding may help us in the future to shape the profile of the aggressive driver and aid us in the provision and prevention of further road incidents. Furthermore the conscientious driver seems to have low stress levels. This fact supports our hypothesis for a primary relationship between stress and aggressive driving and can lead us to more effective interventions in order to address the phenomenon.

DISCUSSION

From the survey results, it has been shown that stress affects the driver's behavior as the higher the stress levels that the driver experiences, the greater was the incidence of aggressive driving behavior in our sample. It has to be mentioned again that even though women appear to be more stressed, male drivers turn out to be more aggressive, enhancing the results from previous studies[35]. Among the main findings of this study is the fact that the most aggressive drivers have increased neuroticism and decreased conscientiousness. Moreover conscientious drivers are less stressed which also explains the reduced self-reporting of aggressive driving. This finding may help us in shaping the future profile of the aggressive driver and create more targeted prevention programs. As Tillman & Hobbs have said, the elements of personality are important and determine how someone lives or drives. "If someone in his personal life is attentive, tolerant, thoughtful and provident, then probably they will drive in the same way. If his personal life lacks these characteristics, then his/her driving will include far more accidents than an other road user." [36] In our sample, the socio-economic factor and age were not differentiating factors with stress and the frequency of aggressive driving behavior. This fact shows that all social and age groups have the same degree of risk in dangerous and aggressive driving if their psychological and emotional state is alike.

Our research, however, has some limitations. The results were based on self-reporting in contrast with the more objective clinical and laboratory evaluations. Despite the fact that we had a sufficient number of participants, a larger sample would help to generalize the results. In addition, in self-reporting surveys there is a risk that the participant will overestimate or even underestimate negative elements such as aggressive driving behavior.

Based on the results of this research, the review of modern studies and previous surveys that were conducted by the Hellenic Research and Educational Institute "Panos Mylonas" for the Road Safety and the Prevention and Reduction of Traffic Accident, we hope that this research will be the beginning of a systematic attempt to address aggressive and delinquent behaviors. The traffic incidents which are the first cause of death for ages up to 29 years old, constitute a major public health problem with multiple impacts on society and development.

In the modern environment which is characterized by its various stimuli within a climate of deep economic recession, stress factors are increased resulting to aggressive and delinquent behaviors. Aggressive driving is linked to unhealthy behaviors and is a characteristic example of the lack of traffic education and culture.

The solutions to enhance safe road behavior go beyond the issue of teaching road safety at schools in order to foster a culture of awareness, responsibility and consistency from the first years of life. It is also essential to develop a healthy and supportive environment that will enable road users to change attitudes and behaviors. We must also highlight the fact that the majority of Greek drivers that have according to studies turned out to be the most aggressive drivers in Europe in their own country, adapt when in other countries and conform to that countries road safety norms. Hence monitoring and enforcing the law, implementing a zero tolerance policy, as well as traffic enforcement are essential keys to enhance safe road behaviors.

Stress has become an integral part of the modern lifestyle that has gotten worse and worse with the economic crisis that we have lived in during the past years. To treat and avoid the negative impact caused by stress we must learn how to read its signs and its trigger points and mainly to learn and adopt techniques that reduce or eliminate the effects of pathological stress.

Generally, stress control is an essential component of education and health promotion and should be addressed in an organized and systematic way at a level that includes both the state and the citizens in order to improve the quality of life, growth and social welfare so that we can contribute to a safe road environment that will change the tragic image and the sad statistics that our country holds and so that we can eliminate the sad numbers that hide the tragic impact on people and dreams that will never be realized. Addressing a multi-parametric, multivariate problem requires alliances and an organized systematic approach in order to achieve these objectives.

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