

## The relationships between personal traits and driving violations in Shiraz

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**Abstract:** The goal of the present study is to investigate the relationships between personal traits and driving offenses in Shiraz. To this end, 1853 professional and ordinary drivers were randomly selected. The tool adopted was 2 questionnaires of Manchester Driving Behaviors (MDB) and the NEO personality inventory. Driving behaviors were investigated in 4 aspects (errors, mistakes, deliberate offenses, non-deliberate offenses) and personality was investigated in 5 aspects (neuroticism, extroversion, openness to experience, agreeableness, and conscientiousness). The results of the analyses showed that among all 5 personality traits, only agreeableness and conscientiousness were positively and significantly correlated with driving offenses. Also, the findings suggested that personality traits, neuroticism, all driving aspects (error, deliberate offenses, mistakes, and non-deliberate offenses) are negatively and significantly correlated; and extraversion, agreeableness, and conscientiousness have significant and positive relationships with all driving aspects; however, agreeableness and non-deliberate offenses were not correlated.

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### Introduction

Driving accidents are the most common events which threaten people's lives and every year, take millions of lives. The injuries due to traffic accidents are one of the main challenges in general health. Every year, 50 million people are seriously injured and 1.5 million ones are killed in accidents. In recent years, the death tolls of these accidents have greatly decreased in developed countries, while they are increasing in developing and low-income societies. According to WHO the issue of road accidents was mainly a behavioral one which could be prevented to a large extent by modifying social and individual behaviors (Yaghubi, 2001). Based on the studies conducted on the causes of accidents, 4 main causes were identified: human, road, vehicle, and environmental factors. The analysis of road accidents in Iran showed that the main factor responsible for accidents is the human factor and in 90 – 95% of the cases of accidents, humans were the main factor or a contributing factor to accidents. Driving is considered as a set of dynamic and complex behaviors (Fanian, 2002).

The quality of the system of values, beliefs, attitudes, feeling, motivations and social and individual behaviors can be the main factor determining the traffic issue. Accordingly, the driver's personal and psychological traits, and the cognitive, emotional, behavioral, and motor- sensory conditions can have the most significant role regarding traffic and driving accidents. Dangerous behaviors of individuals are of greater importance when they threaten other people's lives in addition to the life of the driver. The tragedy of driving accidents is by far more disastrous than other

countries. In Iran a total of 14.9% of all deaths and 26.9% of lost living years are due to accidents with deaths of driving accidents having the first rank (83 in 100000) (Ziari and Khabiri, 2005).

Certain components of psychological factors contribute to violating behaviors. These personal traits include impulsiveness, excitability, extroversion, control source, personal differences, attitude, and social factors.

In an investigation of road accidents in Iran, Tavakol (1998) classified human factors into 4 groups including: a) general manner of driving including wrong performance such as speeding and ignoring traffic signs and wrong behaviors such as driving while tiredness or carelessness, b) sensory and perception failures such as inattentiveness, confusedness, and failing to keep distance with other vehicles, c) driving under the influence of external factors such as taking drugs, drinking alcohol or illnesses, d) lack of adequate skill such as lack of enough experience or lack of sound judgment. Given the first rank of Iran in driving accidents and deaths and economic impacts, social-psychological factors and their roles in accidents seem to be highly important.

### Problem Statement

In today's societies, transportation by motor vehicles is an inevitable component of social, educational and recreational activities. At the same time, driving accidents are among the most important ones which claim thousands of lives around the world. The tragic increase in driving accidents which are among the main factors responsible for deaths, injuries,

disabilities, and economic impacts has turned into an obstacle for social development and public health.

This is so important that the WHO named the international health day in 2004 the day of healthy roads and set 21 long-term goals to reduce casualties and accidents to reach by 2020 (the translation staff in the Health Ministry, quoted in Yunosian and Ali Moradi, 2002).

Studies show that every year 3.5 million people are killed in accidents and violent acts among which 1 million deaths are due to deliberately-made injuries and 2.5 cases are due to driving accidents. Moreover, every 5 seconds a death due to accidents and every 2 seconds, an accident occurs.

It is predicted that these accidents grow rapidly if international authorities don't pay special attention to the security of roads and factors contributing to accidents. Based on the studies conducted on driving accidents, four main factors contributing to accidents have been identified including human factors, roads, vehicles, and environment. In developed countries, the first factor has gained more importance and attracted more attention (Raies Dana, 2001, quoted in Yunosian and Ali Moradi, 2008) and its role in accidents has been clearly emphasized (Arizi and Haghayegh, 2009). A large body of research has been conducted on driving, its psychological components, and their role in maintaining the security of roads (Ozkan and Lajunen, 2005). Regarding their causes and consequences, driving behaviors are classified into positive and negative ones. Negative behaviors include error and violations (Lajunen, Parker, and Summala, 2004). Errors are defined as inability of people to act appropriately in order to reach specified goals, and violations are defined as failing to follow traffic rules and regulations, like speeding.

Violations are classified into deliberate and non-deliberate ones. Generally, driving behaviors are those which are adopted by drivers and follow a specific pattern, including speed, concentration while driving, and keeping standard distance with other vehicles (Hagh Shenan et al, 2005). Many studies have investigated the relationships between driving behaviors and personality traits. Therefore, it could be implied that since personality traits can cause individuals to behave in certain ways which result in meeting their social and psychological needs, investigating the relationships between personality traits and driving behaviors can indicate factors leading to driving accidents (Hagh Shenan et al, 2005).

Psychologically, every individual has some traits which lead him/her to behave in certain ways. These traits constitute the individual's personality. It seems that certain components of personality which contribute to the violation of rules satisfy some needs that contradict with the system of rules and regulations.

Some of these traits include impulsiveness, excitability, extroversion, control source, personal differences, attitude, and social factors (Hagh Shenan, 2005). Given the importance of human factors and investigation of psychological and social factors, the individuals' attitudes toward traffic rules and regulations seem vital.

Although the general consensus is that in driving accidents, human factors play the most important role, there are still some controversies over the issue. These controversies include whether human behaviors are basically responsible for accidents, or which factors can determine the rate of accidents. These factors include social and personal factors, attitudes, individual factors such as physical and kinesthetic skills and abilities, etc.

### Literature review

In a study called "the relationship between aggressive types according to the Caren-Hornay theory with negative and positive driving behaviors and accidents", Haghayegh and Arizi (2009) studied 263 drivers holding type-2 public driving license, using the Negative and Positive Driving Behavior Questionnaire (NPDBQ) and the Horney-Coolidge three-dimensional Inventory (HCTI). The results indicated that all three types of aggressiveness are positively and significantly correlated with driving violations and errors and negatively correlated with positive driving behaviors ( $P < 0.05$ ). There was not a significant correlation between three type of aggressiveness and the rate of accidents. However, gender was correlated with the number of accidents ( $P < 0.05$ ).

Hagh Shenan, Husseini, Jamshidi, and Azizi (1999) investigated 437 drivers in a study named "the relationship between personality traits and driving behaviors in shiraz". The results indicated a positive and significant correlation between the nervousness index of the NEO test with all types of errors and violations ( $P < 0.05$ ). Moreover, they suggested a reverse and significant correlation between agreeability and extroversion with all types of errors and violations ( $P < 0.05$ ). However, no significant correlation between young age and errors and violations was detected. Openness to experiences only correlated with non-violent offenses ( $P < 0.01$ ). Age and the number of years with driving experiences were negatively correlated with non-violent offenses ( $P < 0.05$ ). Also, there was a significant and direct correlation between the number of years of formal education with all types of error and violations ( $P < 0.05$ ).

Smith and Henkert (1998) studied the relationships between college students' personality traits and driving accidents. They investigated risk-taking, self-destruction, and self-esteem. The results showed a negative correlation between self-esteem and accidents, and a non-significant correlation between

risk-taking and self-destruction. Also, between fault-finding traits and self-destruction, there was a significant correlation.

Ulleberg (2001) identified six factors of youth driving by analyzing their reactions in driving accidents and based on the factor analysis of personality. These factors indicated that in risky driving behaviors, different levels of attitude towards healthy driving, perception of danger, estimation of one's driving skills and involvement in driving and judgment were reported. Finally, two indicators were identified for high-risk driving behaviors. The first group mainly included men who possessed low levels of anxiety and altruism but high levels of irritability, lack of responsibility, and driving-related aggressiveness. The second group possessed high levels of irritability, aggressiveness, anxiety and anger while driving. Moreover, the results indicated the influence of gender in different results.

Ivers and Rumando (2002) investigated the role of the personality of drivers in driving accidents in Norway. The results showed that drivers with high irritability showed more norm breaking behaviors and aggressive driving behaviors had higher frequencies in risky drivers. Drivers with more risky behaviors reported more cases of hurting others and being hurt in clashes.

In a study named "the relationships among personality traits, temperament, and driving behaviors", Garrity and Demick (2001) investigated 163 drivers whose driving behaviors were recorded and who answered the NEO questionnaire. They showed that temperaments such as depression, anger, mental exhaustion, physical activities, tension and anxiety in young drivers were related to driving behaviors more than personality traits were.

Patil, Shope, Raghunathan, and Bingham (2008) conducted a phone survey on 5362 young adults in Michigan and several personal factors (risk-taking, aggressiveness, hostility, tolerance, achievement expectations) and driving behaviors (the number of years of driving, risky driving, aggressive driving, and driving under the influence). The Michigan drivers reported serious offenses and special offenses as well. The demographic features such as age, gender, marital status, and income influenced personality traits. Finally, in both genders, high risk-taking abilities, physical and verbal violence, aggressiveness, and tolerance were more significant predictors of competitive attitudes or the specified driving behaviors. However, high risk-taking attitudes, physical and verbal violence, low aggression, and achievement expectations, predicted more serious and special violations.

Oltedal and Rundmo (2005) investigated 1356 Norwegian teens in "the influences of personality and

gender on risky driving behaviors and accidents" and showed that anxiety was meaningfully correlated with seeking excitement and risky driving and seeking excitement was significantly correlated with risky driving and accidents. Data analysis showed that personality traits and gender explained %37.7 of the variance of risky driving behaviors. Therefore, their relationships with risky driving behaviors are not strong and personality cannot predict risky behaviors.

Machin and Sankey (2007) studied the relationship between personality traits, perception of danger, and driving behaviors in young drivers. They studied 159 17 to 20-year-old students. In this study, the subjects filled a virtual questionnaire which measured 4 components of perception of risks and 1 component of driving behaviors. The findings indicated that %39 of the variance of their fast driving was explained by seeking excitement. They did not have a perception of risky behaviors and only were seeking excitement.

Krahe and Fenske (2002) investigated personality traits, age, and the power of the car in "the factors predicting aggressive driving behaviors". In this study, 154 men answered questions of the driving behaviors inventory and questions regarding their demographic qualities and their cars' features. The results indicated that these factors were significantly predictive of aggressive driving behaviors. This kind of behavior was found in drivers with more powerful cars. Totally, these three factors could predict %35.8 of the aggressive driving behavior.

Miles and Johnson (2002) investigated drivers with records of several accidents and compared them with a group of college students. In this study, differences in driving behaviors, the personality pattern of type A, attitudes and beliefs were compared. The findings indicated that there was not a significant relationship between adaptability, consciousness, and neuroticism. In fact, these two groups were not different in these three factors.

### Methodology

This is a descriptive-correlative field study which was conducted using a cross-sectional method. The population consisted of all people in Shiraz who drive (professional and ordinary drivers and those with records of accidents). Given the size of the population, the categorical quota sampling, and the %95 confidence level and %80 power of the test, the sample size was 1853. The subjects were selected randomly and were at least 18 and at most 50 years old and had at least two years of experience in driving, drove at least 6.5 hours per week (based on the investigations conducted on 150 drivers, they drove at least 3 and at most 12 hours per week, and the average hours for

them was 6.5), lack of mental or physical illnesses, and had at least junior high-school diploma.

### Tools

The Manchester driving behavior inventory: it was developed by in 1990 at the department of psychology of Manchester University by Rissen and his colleagues. It was validated in different countries including England, Australia, China, and Finland. The underlying idea in this scale is the fact that violations and offenses stem from different psychological reasons and they should be distinguished from each other. It includes 50 questions arranged on a 0 to 5 Lickert scale. Questions differ in two aspects: the type of the behavior and the kind of risk that behavior has for the other drivers. This questionnaire included items related to "non-deliberate risky errors", "non-deliberate non-risky error", "aggressive illegal actions", and "non-aggressive illegal actions" in driving. In driving behaviors, non-deliberate errors are defined as the failure of planned behaviors to receive the favorable results. Deliberate or illegal errors include deliberate violation of actions which are necessary for security and are divided into non-aggressive deliberate errors in doing which the driver does not mean to behave aggressively but to violate traffic rules and deliberate aggressive errors by doing which the driver meant to behave aggressively.

Abnormal behaviors are classified into 4 groups: non-deliberate errors, mistakes, deliberate violations, and non-deliberate violations. These behaviors are classified into three categories: a) behaviors without any risks for other drivers which only make the anxious (low risk), b) behaviors which might create risks for other drivers (medium risk) , c) behaviors which obviously create risks for other drivers (high risks). For each item, 6 responses are graded on a 0 to 5 scale. The main score is the average score taken from all answers in each part. In another study conducted by Lajunen, Parker, and Summala (2002), all four groups of questions had good reliability. Also, Groeger and Kerand (1996) validated this questionnaire.

### The NEO personality questionnaire

It is a 60-item questionnaire developed to briefly measure 5 main factors (neuroticism, extraversion, openness to experiences, agreeableness, and conscientiousness). Neuroticism includes such negative emotions as fear, grief, irritation, anger, feeling of guilt, constant *كلافه*. Extroverts are sociable. They are assertive, active, and love to talk. They love excitement and action, and tend to be hopeful of future success. Components of openness are active imagination, aesthetic sensitivity, attentiveness to inner feelings, and independence of judgment. like extraversion, agreeableness deals with interpersonal relationships.

An agreeable person is basically altruistic, sympathetic, and willing to help others and believes that others feel the same. Conscientiousness includes the ability to control impulses and desires and implementing plans to reach goals. This test is composed of 5 sets including 12 items related to each factor. Each item includes 5 responses: absolutely disagree, disagree, neutral, agree, absolutely agree, one of which the subjects choose. The correlation coefficients between the scores of the indexes were %92, %90, %91, %77, and %78. The internal consistencies of the indexes were %86, %77, %73, %68, and % 81, respectively.

### Findings

After collecting questionnaires, data were analyzed using the SPSS software. In order to conduct a preliminary investigation on the relationships among variables, the correlation matrix of the variables was developed. Table 1 shows the Pearson correlation coefficients for the quantitative variables.

Table 1: the correlation matrix of the variables

Table 2: the regression results of simultaneous incorporation to study the relationships between personality traits and driving behaviors

As this table shows, among 5 main components of personality, only agreeableness and conscientiousness had a significant and positive correlation with driving behaviors. In other words, an increase in the score of these two components resulted in an increase in the scores of driving behavior. These two aspects explain 30% of the variance of driving behaviors. Getting a higher a score in the driving behaviors questionnaire means worse driving.

### Discussion and conclusion

The findings of research show that among personality traits, neuroticism, all aspects of driving (errors, mistakes, deliberate violations, non-deliberate violations) there was a negative and significant correlation and extroversion, agreeableness, and conscientiousness were positively correlated with all aspects of driving, however, agreeableness and non-deliberate violations were not significantly correlated.

These findings do not support those of Davis and Mahooni (1975), Ivers and Rundmo (2002), Patil et al (2008), Ulleberge (2001), Hagh Shenan et al (1999) and Ferdowsi (2009) who suggested that: irritability, norm-breaking, aggressive driving are correlated with neuroticism, depression, seeking excitement, tension and anxiety. These paradoxical findings might be explained by the fact that neurotic people (anxious) tend to be frightened and get angry more, which results in more awareness of the risks of accidents. Therefore, they try to be more careful and defensive.

Moreover, since no study supported or rejected the finding that agreeableness and conscientiousness

are positively correlated with driving behaviors, it could be argued that it seems sever disorders in driving such as aggressive and violent driving are considered as obvious breakings of a cultural norm (Duk, 2000, quoted in Afrooz, 2006), and some studies have shown the relationships between sensory and cognitive abilities with driving accidents (Ozkan and Lajunen (2006).

The findings show that among all personality traits, only neuroticism was negatively correlated with attitudes toward driving at 0.01 and extroversion, agreeableness, and conscientiousness were positively correlated at 0.01.

These findings are line with those of Ulbergend (2003), Hagh Shenan et al (1999), Yunosian and Moradi (2004) who showed that personality traits and attitudes and good performance in following traffic rules and awareness of driving are related.

Since neuroticism includes anxiety, aggressiveness, depression, impulsiveness, and vulnerability, it can lead to a feeling of inability to

encounter errors and doing illegal act while driving. Moreover, another feature of neurotic people is low self-perception which can lead to an unconscious desire to fail and a constant feeling of failure and finally change the individuals' attitudes towards driving. The studies have also indicated that personality can primarily influence risky driving behaviors by attitude determiners (Ulbergend, 2003).

Since research has suggested agreeableness and extroversion as strong predictors of risky behaviors, the personality traits mentioned in the NEO inventory only reflect the individuals' general orientations and whether these orientations lead to risky behaviors or not depends on environmental factors and other individual characteristics. Therefore, personality traits interact with ather individual, social, and family factors to create constructive or destructive consequences. In most studies, extroversion has been used to explain non-conforming behaviors and even crime (Daderman, 1999, 2001, Davem et al (2005).

Table 1: the correlation matrix of the variables

variables	1	2	3	4	5	6	7	8	9	10
1-neuroticism	1									
2-extroversion	0.42	1								
3-Openness to experiences	0.01	-0.03	1							
4-agreeableness	-0.49	-0.45	0.09	1						
5-conscientiousness	-0.47	0.51	0.05	0.61	1					
6- errors	-0.33	0.30	0.03	0.44	0.48	1				
7-deliberate violations	-0.31	0.30	0.00	0.42	0.48	0.89	1			
8- mistakes	-0.29	0.30	0.04	0.40	0.47	0.91	0.88	1		
9- deliberate violations	-0.23	0.26	-0.01	0.327	0.41	0.73	0.70	0.70	1	
10- driving behaviors	-0.33	0.32	0.02	0.46	0.50	0.97	0.96	0.95	0.78	1

Table 2: the regression results of simultaneous incorporation to study the relationships between personality traits and driving behaviors

Predictive variables	B	$\beta$	R	$R^2$	T	P<
Intercept	15.15				1.36	N.S
Neuroticism	-.041	-0.41			-1.91	N.S
Extroversion	-0.12	-0.02			-0.43	N.S
Openness to experiences	-0.11	-0.01	0.55	0.30	-0.43	N.S
Agreeableness						
conscientiousness	1.76	0.26			6.61	0.0001
	1.52	0.31			7.70	0.0001

**N.S = non-significant**



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