Do Different Jobs and People's Beliefs Affect Their Commitment to High-Risk Driving Behavior?

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Abstract

Since driving behaviors are cross-cultural in nature, they are directly under the influence of the ethical characteristics and mentality of individuals. This reality dramatically connects the driver behavior studies to the study of the humanities. People's jobs can substantially affect their beliefs and legitimacy, which are two critical indicators that successively affect the social lifestyle. This study, for the first time, aims to investigate the effects of the indicators mentioned above and different careers on drivers' behavior. The study uses a mixed questionnaire tool that contains four main parts including demographic information, a modified Driving Behavior Questionnaire (DBQ), the Allport religious orientation scale and the legitimacy questionnaire. The purpose of the study is to investigate the significant relationship between high-risk driving behaviors and the amount of belief and legitimacy of people in different job conditions. Statistical analysis, including analysis of variance (ANOVA), was used for data analysis. A sample of people (n=103) who had the driving license in four groups of jobs (including university professors, students, teachers, private-sector jobs, public-sector jobs) completed the combined self-report survey. The results showed that the type of job has significant effects on one's driving behavior. The public-sector jobs committed the most violations (mean value of 1.64 in a 6-point Likert scale), and students are ranked second in this respect; teachers and university professors have the least high-risk driving behavior. The results of this study can be applied to determine the primer policies of traffic education in different job sectors.

Keywords: Driving behavior, safety, job types, legitimacy, combined survey

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1. Introduction

Since the movement of passengers and road transportation industry is expected to be safe, convenient, cheap, and fast, always the safety has been discussed as one of the main issues in transportation studies. In the last two decades due to an increase in accidents and casualties resulting from it, the safety has become more important. According to the World Health Organization report in 2015, 1.25 million people are killed per year and more than 50 million traffic accidents cause injuries. Projections indicate that these figures will increase by about 65% over the next 20 years unless there is a new commitment to prevention [WHO 2015]. Traffic behavior, especially the high-risk behavior of drivers, is one of the most important aspects of previous studies. Despite various studies in the field of accidents, due to the impact of extensive and complex mental aspects of driver behavior, still, research in this area is necessary.

It is generally accepted that attitudes, behavior, and cognitive processes are all influenced by cultural background [Berry et al. 1992]. The term "culture" refers to recurring patterns of behavior that differ from place to place and thus identify "the shared way of life of a group of people" [Berry 2002]. Cross-cultural psychology is the study of similarities and differences in individual psychological functioning in various cultures and ethno-cultural groups; relationships between driving behaviors have cross-cultural nature that is causing the issue considerably related to socio-cultural and humanities sciences [Berry and Poortinga 2011]. The mood and mentality of individuals directly affect their driving style. Jobs and working place have substantial impacts on ethics and the human behavior of the individuals. Therefore, the type of one's career can affect his or her driving behavior indirectly. This paper is investigating the presence of this relationship.

Human life in society is under the influence of social laws and norms. In the literature, the violations in traffic and ignoring the traffic rules are considered as a disease or abnormal citizenship behavior [Evans, 1996] which can negatively affect the traffic flows [Mohseni and Boroujerdian, 2018]. Social life is an inevitable necessity for human life and it needs social orders, security and regulations. In this context, anything that can keep human social life safe must be considered including the law and social rules.

2. Literature Review

In this section, we first try to briefly review the studies that investigate the socio-economic and psychological factors affecting the driving behavior, and after that, we mention some studies which focus on job environment and religion effects in this regard. [Machado-León et al. 2016] investigated the relation between Socio-economic and driving experience factors and drivers' perception of risk. Five unsafe driving behaviors including paying attention to speed limits, the rules of passing another car and the safe distance, whether or not the driver is distracted, and whether or not she/he is driving under optimal personal conditions, were considered in the analysis and the research proved that these factors can affect the driver's perception and consequently their driving behavior.

[Lingard and Yesilyurt, 2003] introduced the stress on the job as a critical factor affecting the safety of individuals. Several

studies have pointed out the negative impacts of stressful environments of individuals in their safety behaviors such as [Chen and Cunradi, 2008], [Greiner, Krause et al. 2004] and [Krause et al. 1997]. The definition of safety behavior in these studies is the behavior in which the occurrence of adverse and unwanted events are prevented.

A wide range of topics and approaches for researchers about drivers and driving behaviors are linked to psychology [Groeger and Rothengatter, 1998]. One of the ethical and moral psychological measures which can affect the behavior of people is the *religious orientation*. So many studies have been accomplished about the impression of religious orientation on behavioral factors such as happiness [Moltafet et al. 2010], helping behavior [Hansen, Vandenberg et al. 1995], international policies [Kniss and Campbell 1997], self-esteem [Błażek and Besta, 2012], mental health [Gartner, Larson et al. 1991] and other factors. The primary tool in almost all the papers in this issue is the religious orientation scale of Allport [Allport and Ross, 1967]. In this study, the people divided into two groups of intrinsic and extrinsic religious orientation according to their point of view about the existence and nature of God or gods, religious prescriptions about morality and communal and personal spirituality.

Moral values of behavior also have effects on driving characteristics of someone [Eboli, 2017]. For example, it has been shown that the ethical ideologies linked to driving anger [Bailey, Lennon et al. 2016]. Edelsburg et al. tried to determine the socio-demographic variables, attitudes and perceptions affecting safe driving with pre-license driving [Gesser-Edelsburg et al. 2018]. The dimensions of

religiosity also affects the road behavior; in Iran, religion has a positive effect on the improvement of road safety for adolescents [Nabipour et al. 2015]. It has been shown that a clear correlation exists between road fatalities and the Legitimacy scale or the cultural acceptance of rules by the drivers [Dumetz, 2016]. Personality factors also affect the driving safety [Riendeau et al. 2018]. For example, anger people are a serious threat to road safety [Zhang, et al. 2018].

To study the behavior of drivers in transportation studies, psychological measures have been tested both cross-culturally and cross-nationally needed. The Driver Behavior Questionnaire (DBQ) is one of the most important of such tools. The DBQ is a self-reported measure of drivers' engagement in risky driving behavior originally designed by Reason et al. [Reason, et al. 1990] and was refined by Parker et al. [Parker, Reason et al. 1995]. Many studies were done using the DBQ to investigate different factors (such as demographic, ethical, or trip type) affecting the drivers' behavior [Kashani et al. 2016]. The Primary questionnaire consists of three main measures: "Errors", "Lapses" and "Violations". The non-deliberate mistakes or omissions, such as steering the wrong way in a skid considered as "Errors", and errors which made due to lapses in attention, such as reversing into a previously unseen object are "Lapses" and deliberate deviations from safe driving, such as deliberately continuing to drive through a red traffic light are categorized in "Violations". After that, many studies used this tool for evaluating behavioral factors of drivers and some of them tried to modify it into another measure.

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For example, by splitting violations into "ordinary" violations and "aggressive" violations, some studies used a four-measure DBQ [Tavakoli Kashani et al. 2016].

Recently, researchers are dealing with more details of human factors by investigating the psychological and social dimensions of human behavior. Considering the relationship between personality characteristics and driver hazard perception is an excellent example of this issue [Asadamraji et al. 2017].

This paper tries to quantify the people's beliefs and after that, it shows that this variable can be mentioned as a significantly important index in behavioral studies of sustainable transportation. In this study, a modified four-measure DBQ version was chosen which originally driven from [Parker et al. 1995]. The main questionnaire consisted of 28 items which turned into 24 items due to cultural circumstances in Iran. In this questionnaire, the measure of violations divided into two separate measures of "Aggressive violations" and "Highway Code violations. Aggressive expressions of hostility towards other road users or drivers, such as sounding your horn to indicate your annoyance at another road user are considered as aggressive violations. Responses were measured on a six-point Likert scale (0 = Never, 5 = All the time).

3. Problem Description

The general procedure of this study which mainly contains a statistical approach, is presented in this section. We first introduce a mixed questionnaire and variables used to collect the required information and then we present the framework of data analysis used to find the relations between the different variables in the study.

3.1 Questionnaire and Procedure

A Combined cross-sectional, self-report survey was designed to collect data on 5 categories of jobs. It consists of 4 main parts which respectively are demographic questions, the modified Allport scale for measuring one's beliefs, the measure of one's legality and the newly proposed driver behavior questionnaire (DBQ). The study used a battery of standard questionnaires that all the tests, including Confirmatory factor analysis, validity, and reliability, were previously done for them.. Except for a few demographic questions, the whole questionnaire consisted of 60 questions in 3 parts which had 24, 10 and 26 questions respectively. In the second and the third part of the questionnaire participants' responses were collected on Likert scales. Each questionnaire took 20 minutes on average. Table 1 presents a summary of the survey contents. The questionnaires were collected from 5 categories of jobs including university students, people in public-sector jobs (governments' employees), people in private-sector jobs, teachers, and university professors. Participants generally filled the questionnaire in their workplaces.

3.2 Materials

In this subsection, different tools to form the mixed questionnaire used in this study to capture the effects of ethical variables on the driving behavior will be introduced.

3.2.1. Demographic information

The demographic part of the questionnaire included gender, age, type of job, education, work experience of participants and also a

question about whether they are satisfied with their work and lifestyle or not.

3.2.2. The Allport religious orientation scale [Allport and Ross, 1967]

In this part, the participants face 24 yes/no questions of the Allport scale. They should select yes or no according to whether they agree or disagree with the statement. This part leads to the participants' religion orientation which shows whether they are "intrinsic religion" or "extrinsic religion".

3.2.3. Legitimacy scale

The questions of this part, mainly derived from a study in the legitimacy literature [Wang et al. 2012] and also a local study of [Zare and Torkan 1391]. This part is seeking the degree of law acceptance in participants.

In this part, the participants should answer a 10 item questionnaire that was modified to fit into the 6-point Likert-scale where they should give points to each question from 0 to 5 according to the extent they agree with the statement. (0 extremely disagree to 5 strongly agree) At last, it can give the scale of one's legality measurement.

3.2.4. The driver behavior questionnaire (DBQ) [Parker et al. 1995]

In the last part, participants should fill the modified 26-questions DBQ again on a 6-point Likert scale. This time, they should give marks of 0 to 5 according to how often the statement is true in describing their driving behavior.

Table 1. Summary of the mixed questionnaire used in this study

Question category	content	Number of questions
Demographic	Gender, age, marital status, employment status, education, work experience, job satisfaction, etc.	10
Allport religion orientation scale	Whether you believe in god or not, how you think about religion and religious beliefs, etc.	24
Measure of legality	How much you obey the laws	10
DBQ	Speed choice, driving skills, driving errors, lapses in driving, aggressive behavior, violations, etc.	26

Table 2. Summary of demographic data of the study

Demographic category		Statistic/percentage
Gender	Male	75.6
	Female	24.4
Education	Elementary	8.8
	High school	8.8
	B.Sc.	30.7
	MSc	32.2
	Ph.D.	19.5
Job	University students	19.5
	Government's employees (public-sector)	22.9
	Private-sector job	40
	Teachers	11.7

	Professors	5.9
Job satisfaction	Yes	73.7
	No	26.3
religion	intrinsic	27.3
	extrinsic	72.7
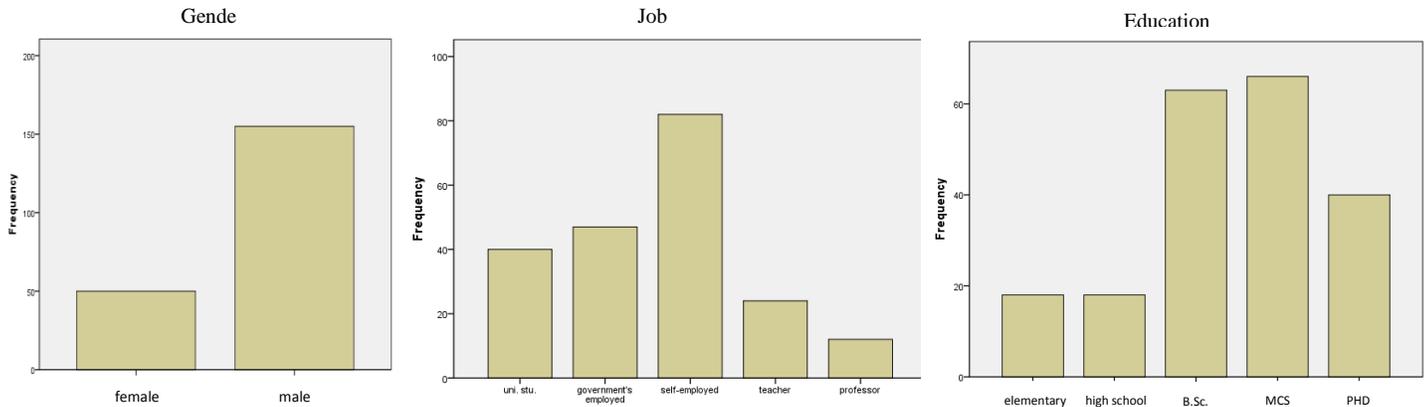
Figure 1. Bar charts of frequencies of different groups of gender, job and education level

3.3 Response Rate and Participants

The data were analyzed using SPSS version 19. Prior to conducting analyses, the data file was examined for accuracy of data entry, missing values, and outliers. The participants were randomly chosen among five predetermined careers. A total of 120 participants filled the questionnaire that 103 (85 percent) of them were suitably valid for the research. 20 university students, 24 employees, 41 private-sector job, 12 teachers and 6 professors cooperated in filling the survey.

Table 2 and Figure 1 provide a summary of participant demographics and frequency of different groups respectively. Participants' ages ranged from 24 to 52 years, with an average age of 33.5 years, and 50.5 percent were married. 73.8 percent of participants were satisfied with their job and others (26.2 percent) were not satisfied.

3.4 Study Design

To compare drivers' behavior in different groups of jobs, first of all, each participant's mean scores for the four factors of DBQ (Errors, lapses, Aggressive Violations, Highway Code Violations) were computed 0 to 5 for each factor. Also, the level of Legitimacy was computed ranged from 0 to 30. There are some nominal variable in the survey which were converted to classified ordinal variable in order to make them computable in the study: (1) gender (male=1, female=0), job satisfaction (yes=1, no=0), marital status (married=1, unmarried=0), religion (0= intrinsic religion, 1= extrinsic religion) , job type (1=university students, 2=public-sector job (government employees or public-sector jobs), 3=private-sector job, 4=teachers, 5=university professors). The public-sector in this research consists of the

government's organizations such as municipality or ministry personnel.

Analysis of variances (ANOVA) was then used to examine the relationships between groups of jobs, levels of legality, demographic factors, and driving characteristics. Technically, it can be said that the sample group means are unbiased estimators of the population group means when treatment is randomly assigned. The meaning of unbiased here is that the true mean of the sampling distribution of any group sample means equals the corresponding population means. The sampling distribution of $\bar{Y}_i$ is $N(\mu_i, \delta^2/n_i)$ precisely under the Normality, independence and equal variance assumptions. In one-way ANOVA, the overall null hypothesis with k groups is: $H_0: (\mu_1 = \mu_2 = \cdots = \mu_k)$ and the alternative hypothesis is that \the population means are not all equal.). Calculating the F-statistic as the ratio MS between=MS within is the next step. Where MS within is "mean square within-groups", and MS between is "mean square between-groups". Then the p-value is calculated as the area under the appropriate null sampling distribution of F that is bigger than the observed F-statistic. The null hypothesis will be rejected if $p \leq \alpha$.

In this study, if the null hypothesis is rejected it can be said that the different types of jobs affect the dependent variables (for example aggressive violation as one of the high-risk behaviors).

4. Results and Discussion

In this section, we present the main outputs of the study. At first, the inter-correlation between different variables will be derived from the results and then the effects of different job types and the amount of beliefs on high-risk behaviors will be discussed.

4.1. Inter-Correlations between Variables

Table 3 contains two main information: 1) descriptive statistics and intercorrelations between all variables, 2) The significant correlations between all the variables are also shown in the table (2-tailed). Some interesting interpretations can get into consideration about this table:

-significant correlations of age with religious orientation, legitimacy scale, errors; (significant correlation of age with job experience and marital status is unimportant fully expected): it can be seen that people generally get more religious when they become older and they also obey the rules (high legitimacy scale), but they commit more lapses while driving. It can be because of brain function. Similar results about positive relations between age and driving mistakes or lapses were reached by previous studies such as [Goh, Currie et al. 2014, Cordazzo, Scialfa et al. 2016].

-A positive correlation between religious orientation and job satisfaction and also legitimacy scale: the religious people usually obey the rules better in comparison with others and they are also satisfied with what they have.

-a negative correlation of lapses with both legitimacy scale and religious orientation: logically, it cannot be interpreted by itself but the positive correlation between religious orientation and age can be the key to solve this dilemma.

-correlation between Legitimacy scale and marital status: it can be said that people become more prudent after marriage.

-The correlation of Highway Code Violations as the fourth main factor of driver's behavior with job type and job

experience (negative), marital status (negative), legitimacy scale (negative) and aggressive violation (positive): The relation between different job types and high-risk driving behavior will be focused in the following of this study. The negative correlation of Highway Code Violations and job experience or marital status is mainly relevant to age.

Table 3. Means, standard deviations, variances and inter-correlations for measures of different variables in the study.

variables	M	SD	V	1	2	3	4	5	6	7	8	9	10	11	12	13
1) Job type	2.61	1.11	1.22	1.00												
2) Education	3.45	1.16	1.35	-.18*	1.00											
3) Job satisfaction	.74	.44	.20	.19*	-.13	1.00										
4) Job experience	7.96	9.13	83.39	.29**	-.01	.23**	1.00									
5) Marital status	.49	.50	.25	.30**	.05	-.07	.48***	1.00								
6) Age	33.41	7.97	64.46	.08	-.10	.25**	.67***	.64***	1.00							
7) Gender	.76	.43	.19	-.16	.24**	.07	.12	.02	.26**	1.00						
8) religious orientation	.73	.45	.20	-.18*	-.22*	.33***	.19*	.04	.36***	.21**	1.00					
9) Legitimacy scale	16.55	5.79	33.47	-.09	.10	-.15	.18*	.45***	.34***	.08	.33***	1.00				
10) Lapses (DBQ)	1.57	.85	.72	.11	.14	-.19*	-.23**	-.01	-.17*	-.17	-.50***	-.40***	1.00			
11) Errors (DBQ)	1.09	.72	.52	-.16	-.07	-.10	-.26**	.20*	.30**	.08	-.07	-.02	.32***	1.00		
12) Aggressive Violations (DBQ)	1.26	.77	.60	-.15	-.04	.14	-.27**	-.26**	.07	.05	.11	-.14	.14	.27**	1.00	
13) Highway Code Violations (DBQ)	1.10	.64	.41	-.33***	.18*	.09	-.35***	-.49***	-.20*	-.01	-.06	-.35***	.15	.15	.69***	1.00

N = 259. Note: Unmarked values represent Pearson's (r) correlations.

  * $p < .05$.

  ** $p < .01$.

  *** $p < .001$.

-The interesting point is that the results do not show the absolute significant correlations between the level of education and high-risk driving behaviors but it has a negative correlation with the religious orientation.

4.2 Initial Assessment of High-Risk Behavior in Different Jobs

Figure 2 shows the overall pattern of driving behavior according to job type by box plots. We can see in the figure that university professors generally have comparatively short box plots. It means that in the sample, most of the university professors have agreements in their responses. For the government's employees, it is vice versa and their comparatively tall box plots show that they hold quite different opinions in their responses. It can be clearly seen that the mean value of different high-risk driving behaviors for teachers is less than other types of jobs. The initial impression about the impact of job type on high-risk driving behavior is that both aggressive violation and highway-code violations are higher for public-sector jobs than other types of jobs.

4.3 Assessing the Effect of Religious Orientation on Drivers' Behavior

Table 4 shows the difference between the mean of 4 Drivers' high-risk behavior factors in two religious orientation (intrinsic religion, extrinsic religion). In order to assess whether the difference between the variances

are significant or not, first of all, the homogeneity test was applied for variances. As can be seen in the table, although the ANOVA shows significant variance between intrinsic and extrinsic religious people in lapses, these values are not homogeneous. This relationship is more significant for aggressive violations. Previously according to Pearson's correlation scale, it was found out that lapses of drivers have a significant correlation to their religion and also their legitimacy (table 3).

4.4 Assessing the Effect of Job Type on Drivers' Behavior

The ANOVA was used to assess the relationships between the 4 factors of drivers' high-risk behavior and the type of jobs they have. The results showed that the homogeneity of variances was significant for all the categories of jobs using the Levene Test. The difference between the variances was significant for the last 3 factors of drivers' behavior. Table 5 summarizes this information. In this part, the relationship between the job types and the diving behavior of participants can be found out; however, seeking more detailed information about this relationship is still unknown. Post HOC comparison means needed to assess the multiple comparisons between every two groups of jobs. 3 tests of Least Significant Difference (LSD), Tukey's test and Scheffe test were used for the multiple comparisons. The outputs of these tests are shown partly in the appendix.
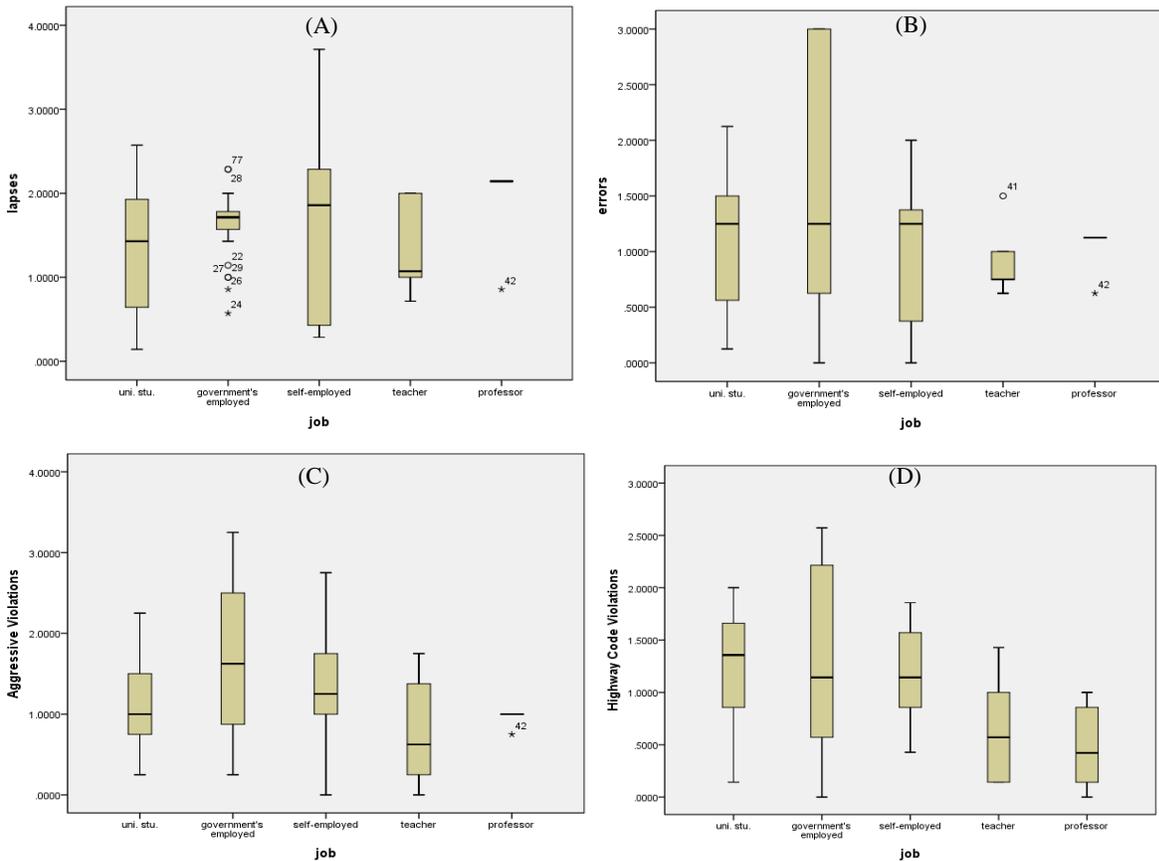
Figure 2. Boxplots of different high-risk driving behavior factors according to job type; A: Box-plots of lapses for different job types; B: Box-plots of errors for different job types; C: Box-plots of aggressive violations for different job types; D: Box-plots of highway code violations for different job types

The results showed that the mean difference at the 0.05 level was significant for some driving behavior within job groups:

- People's religious orientation significantly affects the driving lapses in which drivers with intrinsic religious orientation commit more lapses then drivers with extrinsic religious.

- The mean difference of errors (as the second drivers' high-risk behavior) between the government's employees and people with a private-sector job was significant. The results show that the people in public-sector jobs commit more errors while driving in comparison with the people in private-sector jobs. The reason for this result may refer to acquisitive ethical ideologies that someone gains from his/her workplace. Fatigue caused by long hours of working is another reason for that.

Table 4. Mean value, F value and P-value of ANOVA for different drivers' behavior by religious orientation

		Mean	Test of homogeneity		ANOVA	
lapses	intrinsic religion	2.270415	Levene statistic	0.673	F value	34.566
	extrinsic religion	1.314069	Sig.	0.414	Sig.	0.000
errors	intrinsic religion	1.178571	Levene statistic	7.891	F value	0.553
	extrinsic religion	1.060000	Sig.	0.006	Sig.	0.459
Aggressive Violations	intrinsic religion	1.125000	Levene statistic	12.502	F value	1.223
	extrinsic religion	1.313333	Sig.	0.001	Sig.	0.271
Highway Code Violations	intrinsic religion	1.157698	Levene statistic	0.115	F value	0.307
	extrinsic religion	1.078816	Sig.	0.736	Sig.	0.580

- For aggressive violations, the mean difference between teachers and public-sector jobs was significant. Again the public-sector jobs commit more aggressive violations through their driving in comparison with teachers. Generally, teachers' violation commitment was significantly low in comparison with other types of career. University professors were in the second rank of low violation commitment.

- Again for aggressive behavior, the significant mean difference is shown between public-sector jobs and university professors.

- University students commit significantly more highway-code violations than university professors and teachers. The reason for that can be the high sensation seeking of youth.

- For Highway Code violations commitment university professor has the lowest mean

5. Limitations

The study has some clear limitations, especially in its data. For job classifications, more groups of jobs can be considered like doctors. The private-sector job group also can be classified into more detailed groups like shopkeepers, mechanics, drivers and etc. generally the size of the sample in the study can be enhanced so this study is a pilot small empirical study in this issue. If the sample size was big enough, it could lead to huge statistical analysis and finding different behavioral distributions among different groups. Generally, as the findings of this study are inherently exploratory about the ethical characteristics of drivers, it is needed for more research in order to reach into implicit recommendations and confirm the results.

Another limitation is that the questionnaire of the study was a self-reported survey; thus the data might have been slightly biased. Although all the participants were assured that the data is just for transportation research and it would not be abused, some participants, especially those worked government organizations, might either exaggerate or understate their answers.

Table 5. Mean value, F value and P-value of ANOVA for different drivers' behavior by job type

		Mean	homogeneity		ANOVA	
lapses	university students	1.335716	Levene statistic	8.227	F value	0.935
	government's employees	1.612445				
	private-sector job	1.668986				
	teachers	1.392811	Sig.	0.000	Sig.	0.447
	professors	1.928600				
errors	university students	1.100000	Levene statistic	11.969	F value	2.846
	government's employees	1.489583				
	private-sector job	.923780				
	teachers	.885417	Sig.	0.000	Sig.	0.028
	professors	1.041667				
Aggressive Violations	university students	1.125000	Levene statistic	5.737	F value	3.194
	government's employees	1.635417				
	private-sector job	1.292683				
	teachers	.791667	Sig.	0.000	Sig.	0.016
	professors	.958333				
Highway Code Violations	university students	1.281250	Levene statistic	4.717	F value	4.453
	government's employees	1.244051				
	private-sector job	1.160272				
	Teachers	.619065	Sig.	0.002	Sig.	0.002
	Professors	.474099				

6. Conclusions and Practical Application

This study investigated the relationship between high-risk driving behavior and some ethical factors and also the impact of people's job type on their driving behavior. A self-reported mixed questionnaire was used, including 4 parts of demographic, DBQ, Allport religious orientation scale, and legitimacy scale.

The intercorrelations between all the variables were examined first. The analysis of variances and multiple comparisons between variables were used to investigate the relations. The results showed that the job type of people significantly has a relationship with their driving behavior. Similar results about considerable relationships between job

atmosphere and stress with driving mistakes or lapses were reached by previous studies. The governments' employees or public-sector, for instance, commit more high-risk driving behaviors in comparison with other types of jobs. The university students showed more aggressive behavior. This might be referred to as their high-value sensation seeking scale. Teachers commit lower violations than other types of jobs, and university professors were the second in low violation commitment.

As one of the main factors of road safety is the human factor, this study directly relevant to safety providing absolutely helpful findings of the social psychology and morality of drivers. The findings of the study can show different high-risk driving behaviors related to different jobs. The results show that public-

sector jobs and university students commit more Highway Code Violations than other types of jobs. So more useful education of traffic rules and driving in universities and government organizations are considered as a countermeasure.

One of the most notable results from this study is the significantly high errors and violations commitment of governments' employees in comparison with other types of jobs. It can be due to acquisitive ethical ideologies that an employee gains from his/her workplace which becomes part of his/her ethical characteristics in the long-term. It can directly be concluded from the deficiency of education tools in governments' organizations. Improving employees' knowledge about driving rules, traffic, and safety behaviors certainly can be useful to solve this dilemma.

This study was done for the first time in Iran to seek the impacts of social activities on driving behavior. Indeed there were many limitations in the survey that can be revised in future works. The job atmosphere and more detail human factors can be investigated by an adequate sample in future studies.

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