

Factors Affecting Public Drivers' Sense of Rule Violations

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Abstract: The aim of this research was to examine the predictors of drivers' sense of rule violations including sensation seeking, aggressiveness, assertiveness, confidence in driving ability, time pressure, and perception of changes of being caught. Three hundred and forty-nine drivers working in various public departments participated in the study. The dependent variable namely drivers' perception of rule violations was used to examine factors leading risky driving. The result showed that sensation seeking, assertiveness, confidence in driving ability, time pressure, and possibility of being caught affected drivers' perception of rule violation.

Keywords: Risky driving, sensation seeking, aggressiveness, time pressure.

Sürücülerin Kural İhlalleri Algısını Etkileyen Faktörler

Öz: Bu çalışmanın amacı sürücülerin kuralları ihlal etmelerine neden olan heyecan arayışı, saldırganlık, sertlik, sürüş yeteneğine güven, zaman baskısı ve yakalanma algısı gibi etkenlerin incelenmesidir. Değişik kamu kurum ve kuruluşlarında çalışan 349 kamu sürücüsü çalışmaya katılmıştır. Çalışmada sürücülerin yasaları ihlal alguları sürücülerin tehlikeli sürüş davranışlarını anlamak için bağımlı değişken olarak kullanılmıştır. Sonuçlar heyecan arayışı, sertlik, sürüş yeteneğine güven, zaman baskısı ve yakalanma algısı gibi nedenlerin sürücülerin kuralları ihlal algısı ile ilgili olduğunu göstermiştir.

Anahtar Kelimeler: Tehlikeli araba kullanma, heyecan arayışı, saldırganlık, zaman baskısı.

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Introduction

Driving motor vehicles, especially in big cities, is not an easy task for any drivers regardless of their age, gender and experience level. Further, driving can be a major lifestyle choice and stressful job for drivers who have to spend most of their time in heavy traffic as part of their job. Both public and private organizations recruit drivers to take care of the organizations' daily tasks such as transporting staff, documents or equipment. In Ankara, where the capital of Turkey is and where all ministries and their sub-agencies and departments are located, public organizations have their own driver teams (hereafter public driver). Although public drivers are a small percentage of all drivers, they spend about five hours on roads during their eight hours daily shift. However, this does not necessarily mean that they travel more, but they spend most of their times and stuck in the heavy urban traffic.

As Machin & Sankey (2008) noted, risky driving includes self-assertive driving, speeding, and rule violations. According to Davey et al. (2007), the number of drivers who drive aggressively and commit traffic violations is increasing. Working in public organizations and being recorded in terms of driving history do not lead individual differences between public drivers and average drivers, since most of the institutions do not apply any psychological test for hiring drivers in their units. As reported by Turkish National Police (personal communication, March 15, 2014), there are 1,089,469 private vehicles (car: 1,071,200; minibus: 15,796; and bus: 2473), 29,071 commercial vehicles (car: 10,132; minibus: 7,016; and bus: 11,923), and 12,240 public vehicles (car: 7,834; minibus: 1,376; and bus: 3,030) in Ankara as of December 31, 2013. The number of public drivers involved in crashes, causing serious injury or death, is 343 in 2011, 421 in 2012, and 402 in 2013 whereas the total amount of the crashes, causing serious injury or death, is 9,683 in 2011, 11,092 in 2012, and 11,089 in 2013 in Ankara. Although the number of the public drivers is only one percent of all drivers in Ankara, they account for 3.6% of the all crashes occurred in Ankara in 2013. Thus, the aim of this study is to understand and examine factors affecting public vehicle drivers to violate traffic rules.

1. Human Behavior and Traffic

Ajzen (2005) noted that the more people engage in intentions toward their respective behavior, the more likely their behaviors become routine or habitual. Researchers (Reason et al. 1990; Parker et al., 1995a; Xie & Parker, 2002; Xie et al., 2002; Stradling et al., 2002) found and argued that intentional driving violations cause and increase the likelihood of crash risk and crash involvement. Human errors are the major component of the causes of traffic accidents (Rumar, 1985; Dahlen et al., 2005; Dahlen & White, 2006). According to Rumar (1985), human error is the most important factor in traffic accidents that overall 95% of the accidents in Great Britain and Indiana US were caused by human errors directly and through interaction with other factors like road conditions or mechanic problems.

Based on the factor analysis of “Driver Behaviour Questionnaire”, Reason et al. (1990) distinguished human errors into three categories: Violations, dangerous errors, and silly errors. Several other researchers replicated the study of Reason et al. (1990) with different populations and environments and found similar results (Aberg & Rimmo, 1998). Therefore, it could be argued that to prevent future traffic violations and subsequently possible accidents stemming from those violations, researchers should examine drivers’ intention to commit traffic violations and determinants of traffic violations.

Existing research shows that sensation seeking is related to traffic violations (Xie & Parker, 2002; Iversen & Rundmo, 2002), since reckless behaviors like traffic violations “provide the kind of novel and intense stimulation that people high in sensation seeking find pleasurable” (Arnett, 1996, p. 693). High sensation seekers are more likely to engage in risky driving and subsequently commit more traffic violations and involve in more accidents (Zuckerman, 2007). Arnett (1994) and Arnett et al. (1997) found that sensation seeking is related to various types of traffic violations including speeding, racing another car, and passing another car in no-passing zone.

Another driver behavior investigated by researchers is aggressiveness (Lajunen et al., 1998; Deffenbacher et al., 2001; Deffenbacher et al., 2003; Xie & Parker, 2002). In the same studies, Arnett (1994) and Arnett et al. (1997) found that aggressiveness is also related to traffic violations. The relationship between the aggressiveness and traffic violations is established in other studies as well. For example, Lajunen & Parker (2001) found that aggression has an effect on drivers’ reckless driving. The study conducted by Berdoulat et al. (2013) showed that aggressiveness with impeded progress is the best predictor of traffic violations and aggressive violations. Similar results are also found by Ozkan & Lajunen (2005) that aggressive drivers are more likely to involve traffic violations.

Researchers also examined the relationship between assertiveness and traffic violations. Michiels and Schneider (1984) found that self-assertiveness and competition as a part of masculinity affects people’ driving style and are related to the type of traffic offences especially overtaking another driver, driving while intoxicated, and fast driving. That is men are more likely to commit those violations than women do. Further, Krahe & Fenske (2001) argued that people having higher levels of masculinity tend to show their “masculine driving style” to others (p. 23). Based on the existing research, they (2001) noted that those people drive their car more risky when they have male passengers in the car than driving alone and young driver having higher level of masculinity are more likely to drive risky when they have their peers in the car comparing to driving alone or with their parents. In the same study, Krahe & Fenske (2001) found that macho personality is related to risky driving.

Drivers’ confidence in their driving ability is another factor examined by researchers to understand antecedents of traffic violations. Most of the drivers see themselves more

skillful and safer than average drivers (Dejoy, 1992; Parker et al., 1995b; Elander et al., 1993). Younger people relative to older people and men relative to women tend to overestimate their driving skills (Groeger & Brown, 1989; Dejoy, 1992; Gregersen, 1996). Drivers especially men are more likely to adjust their driving behaviors, tend to obey traffic rules conditionally, and criticize the existing traffic laws based on their perceived self-driving skills (Yagil, 1998). They are not motivated to follow traffic rules and more likely to involve traffic violations and accidents (Yagil, 1998). Basically, drivers who overestimate their driving ability tend to underestimate the risks they may encounter on the road (Gregersen, 1996). Although existing research on the relationship between perceived sense of driving skills and traffic violations and accidents is mixed, people's over estimation of their driving skills is related to traffic violations and accidents (Laapotti et al., 2003).

2. Methodology

The sample of this study consists of professional drivers working in public organizations including ministries, their sub-agencies, and local municipalities located in Ankara. Among all the institutions in the sample, thirteen of them expressed their willingness to participate in this study. We believe, however, the sample of the study is representative of all public sectors as a whole for a couple of reasons. First, since Turkey enforces centralized administrative system, the hiring process of a driver is somewhat similar for all public organizations. Second, since they all work for public institutions, their job experiences and views are also similar. Drivers' working hours, payments, and other social rights are granted and regulated in accordance with the same law and regulation.

The questionnaire was developed and adapted from earlier studies (Ulleberg & Rundmo, 2003; Lajunen & Summala, 1995; Lajunen & Ozkan, 2011; Meijman & Kompier, 1998). A Likert scale with a range of 1 (strongly disagree) to 4 (strongly agree) or 1 (never) to 4 (always) was used to measure drivers' attitudes on various measures. The survey was administrated in less than two weeks with the help of a third person. A total of 400 drivers were informed and asked to participate the study, out of which 349 returns were usable surveys, representing a 87 percent response rate. Results of the bivariate and multivariate analyses were presented after conducting principal component analyses and examining scale reliabilities (see appendix).

2.1. Empirical Specification

2.1.1. Dependent Variable

The dependent variable of this study is drivers' intention to violate traffic rules. Reason et al. (1990) describes violation as "deliberate deviations from those practices believed necessary to maintain the safe operation of a potentially hazardous system" (p. 1316). The distinction between violations and errors is that priority of intention before

executing behaviors (Reason et al., 1990). If there is no intention before the executed behaviors, they can be called as errors stemming from people's insufficient cognitive processes (Aberg & Rimmo, 1998). A violation in traffic refers to "deliberate deviations from safe driving practices" (Lajunen et al., 1998, p. 109). The scale consists of three items adapted from Ulleberg & Rundmo (2003).

2.1.2 Independent Variables

Sensation seeking, aggressiveness, assertiveness, and confidence in driving ability, identified in the literature are the independent variables in the study. Sensation seeking refers to "a trait defined by the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (Zuckerman, 1994, p.27). Sensation seeking scale comprised four items adapted from Lajunen & Summala (1995).

Aggression refers to any form and sequence of behaviors directed toward another individual who does not want to be harmed with the intention to cause harm or to injure (Baron, 1977; Berkowitz, 1989; Anderson & Bushman, 2002; Bushman & O'Brien, 2012). Thus, aggressive driving refers to a behavior intentionally committed by drivers to harm physically, emotionally, or psychologically other road users (Lajunen et al. 1998; Hennessy & Wiesenthal, 2005). Aggression can be in the form of physical, verbal, or relational (Busman & O'Brien, 2012). To measure drivers' aggressiveness, an aggressiveness scale developed by Lajunen & Summala's (1995) and Lajunen & Ozkan's (2011) was used. The adapted version of the aggressiveness scale consists of two items.

According to Hennessy & Wiesenthal (2002), researchers tend to distinguish aggressiveness from assertiveness. Aggressiveness and assertiveness fall into two different driving behavior categories. While both of them lead driver to make violations or risky actions, aggressiveness, as described earlier, refers to any harmful behavior of drivers towards other drivers. Thus, assertive driving can be described as "time urgent and self-oriented behaviors" without intentionally harm to other drivers (Hennessy & Wiesenthal, 2005, p. 62). As mentioned earlier, assertiveness is related to people's driving style. People having higher level of assertive feelings tend to drive more risky when there are passengers in the vehicle. To test whether assertiveness is related to traffic violation or not Ulleberg & Rundmo's (2003) assertiveness scale was used. The scale comprised of two items.

Drivers' confidence in their driving ability is developed on the concept of Bandura's (1977) self-efficacy. Bandura (1995) defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (p. 2). Although Bandura (1997) noted that self-efficacy differs from the term self-confidence, Allen & McCarthy (2014) noted that researchers tend to see self-efficacy and self-confidence as same construct and researchers use self-efficacy and self-confidence

interchangeable (Sullivan & Feltz, 2005). To measure participants' confidence in their driving skills Lajunen & Summala's (1995) scale was included into the study. The scale comprised two items.

2.1.3 Other Situational Factors

Time pressure and the perception of chances of being caught are situational factors affecting people's driving style and traffic violations (Stern, 1999; Alper & Karsh, 2009; Peer, 2010; Meijman & Kompier, 1998). It is argued that drivers justify traffic violations when they expose to time pressure and tend to ignore possibility of accidents to arrive their destinations on time (Yagil, 2001). For example, Adams-Guppy & Guppy (1995) found that time pressure is related to drivers' traffic violations. Another study conducted by Beilock (1995) showed that difficult or unreasonable delivery schedules lead truck drivers to commit traffic violations. Participants' sense of time pressure was measured by Meijman & Kompier's (1998) scale consisting of two items.

The second situational factor related to traffic violation is the drivers' perception of getting caught by law enforcements. According to Rothengatter, (1991) "a major factor determining traffic law compliance is the subjective probability of detection when committing an offense" (p. 85). Holland & Conner (1996) noted that police surveillance reduced the proportion of vehicles travelling high speed. A scale comprised of two items was used to measure participants' sense of drivers getting caught by police officers. In a study conducted by Grasmick & Milligan (1976), it was showed that perceived probability of apprehension was related to traffic violations.

2.1.4 Demographic Characteristics

Researchers (Reason et al., 1990; Aberg & Rimmo, 1998; Xie & Parker, 2002) argued that gender, age and travel distances are other important factors related to driving violations. That is, younger drivers tend to commit more driving violations than older drivers and drivers who travel longer distances are more likely to commit more traffic violations than drivers who travel shorter distances. However, the paper did not include gender factor, since there was no female participants in the study.

3. Results

Table 1 demonstrates the general characteristics of the study participants. As seen in this table, the age of the participants ranged from 21 to 62 with the average age of 41. Eighty-two (82%) percent of the participants were married. The education level of the participants ranged from primary school to college or above. Most participants have either high school degree (51%) or two-year college degree (17%). Thirty-seven percent of the participants have worked in this job for 11 to 20 years, while 30% of the participants have worked for 21 to 30 years. The average year of experience is 19 years. Almost half of the participants (48%) stated that they make more than 101 km per day on weekdays. More

than half of the participants (52%) indicated they drive four hour or less per day, while 48% of the participants stated they drive five hours or more per day.

Table 1: Descriptive Statistics of Participants (N=349)

Variable		N	%	Mean	SD	Min	Max
Age	1 = ≤ 30 years	58	17	41.15	9.25	21	62
	2 = 31 - 40 years	114	33				
	3 = 41 – 50 years	115	33				
	4 ≥ 51 and above	62	19				
Marital Status	Married	322	92	1.08	.28	1	3
	Single	26	7				
	Widow	1	.3				
Education	Primary School	22	6	3.10	.99	1	5
	Secondary School	54	16				
	High School	177	51				
	Two Year College	59	17				
	College or Above	37	11				
Years of Experience	1 = ≤ 10 years	84	24	18.81	9.60	1	43
	2 = 11 - 20 years	129	37				
	3 = 21 - 30 years	103	30				
	4 = ≥ 31 years	33	10				
Daily Driving Distance	1 = ≤ 50 km	60	17	125.64	73.44	20	250
	2 = 51 - 100 km	123	35				
	3 = ≥ 101 km	166	48				
Daily Driving Time	0 = ≤ 4 hours	183	52	4.60	2.41	1	10
	1 = ≥ 5 hours	166	48				

Table 2 shows the results of the correlation analyses among the study variables. Aside from possibility of being caught, higher values of the scales indicate participants to have higher level sense of any of these items. For the possibility of being caught, higher values mean participants to have lower sense of being caught for traffic violations. The results suggest that the variables sensation seeking ($r=.22$, $p<.001$), aggressiveness ($r=.11$, $p<.05$), assertiveness ($r=.41$, $p<.001$), confidence in driving ability ($r=.20$, $p<.001$), time pressure ($r=.25$, $p<.001$), and possibility of being caught ($r=.30$, $p<.001$) are significantly related to drivers' intention to rule violation. These results suggest that the increase in participants' sense of any of these variables lead participants to have higher sense of

rule violation However, the results indicate no relation between participants' age, marital status, education, year at work, daily driving distance and daily driving time and rule violation.

Table 2: Intercorrelations among Study Variables (N=349)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Rule Violation	1												
Sensation Seeking	.22***	1											
Aggressiveness	.11*	.32***	1										
Assertiveness	.41***	.02	.13*	1									
Confidence in Driving Ability	.20***	.01	.05	-.00	1								
Time Pressure	.25***	.32***	.30***	.15**	.14*	1							
Possibility of Being Caught	.30***	.06	.18***	.33***	.04	.15**	1						
Age	-.02	-.21***	-.09 ^a	.06	-.25***	-.29***	.03	1					
Marital Status ^b	.04	-.16	-.02	.08	-.15***	-.09 ^a	.10 ^a	.37***	1				
Education ^c	-.05	.04	.03	.02	.03	.16**	.11*	-.20***	-.09	1			
Year at Work	-.06	-.18***	-.05	.07	-.19***	-.25***	.02	.76***	.27***	-.19***	1		
Daily Driving Distance	.08	.10 ^a	.04	.01	.10 ^a	.02	.02	-.17**	-.01	-.06	-.13*	1	
Daily Driving Time	-.05	-.02	-.09 ^a	.02	.05	-.08	-.03	.03	-.04	-.23***	.10 ^a	.30***	1

b= 0=other, 1=married; c= 0=high school or less, 1= two year college or above; *p<.05, **p<.01, ***p<.001, ^ap<.10

Table 3 shows the results of the multivariate OLS regression analyses. The results indicate that the partial model in which participants' demographic variables included was not significant. In the full model, however, the findings suggest that 28% of the variance in participants' sense of rule violations is significantly explained by the model ($R^2=.28$, $F=11.78$, $p<.001$). The independent variables which are sensation seeking ($B=.35$, $p<.05$), assertiveness ($B=.53$, $p<.001$), confidence in driving ability ($B=.14$, $p<.01$), time pressure ($B=.21$, $p<.05$), and possibility of being caught ($B=.24$, $p<.001$), all suggest a positive relationship with participants' sense of rule violation. Therefore, it can be suggested that drivers having higher sense of sensation seeking, assertiveness, confidence in driving ability, time pressure, and possibility of being caught (higher values mean less likely to being caught) are more likely to have higher sense of rule violations. However, none of the demographic variables, distance made per day, and driving time per day are not related to dependent variable at $p<.05$ level.

Table 3: Summary of Regression Analysis for Variables Predicting Rule Violation & Risky Driving (N=349)

Variable	Rule Violation					
	Partial Model			Full Model		
	B	SE	β	B	SE	β
Constant	6.27***	.71		1.06	.94	
Age	-.01	.01	-.03	.00	.01	.02
Marital Status ^b	.37	.47	.05	.14	.41	.02
Education ^c	-.33	.28	-.07	-.61	.24	-.12
Daily Driving Distance	.00 ^a	.00	.10	.00	.00	.07
Daily Driving Time	-.08	.05	-.09	-.08 ^a	.05	-.09
Rule Violation						
Sensation Seeking				.35*	.14	.13
Aggressiveness				-.10	.09	-.06
Assertiveness				.53***	.08	.34
Confidence in Driving Ability				.14**	.05	.13
Time Pressure				.21*	.08	.14
Possibility of Being Caught ^c				.24***	.07	.18
R ²		.02			.28	
F		1.25			11.78***	

b= 0=other, 1=married; c= 0=high school or less, 1= two year college or above;
 *p<.05, **p<.01, ***p<.001, ^ap<.10
 c:higher scores mean driver think they less likely to be caught by police

4. Discussion and Conclusion

This study reviews the literature and examines the predictors of participants' (public drivers) sense of rule violation and risky driving behaviors. This study examines this model to understand the driving behaviors of public drivers in Ankara. Rule violation model was examined with variables including sensation seeking, aggressiveness, assertiveness, confidence in driving ability, time pressure, and possibility of being caught. The results indicate that all variables but participants' sense of aggressiveness are related significantly and positively to drivers' sense of rule violations. However, the relationship between aggressiveness and rule violations is significant at the bivariate level. Thus, it could be concluded that aggressiveness lost its strength in the model after controlling for other variables.

The findings of this research make important contributions to existing literature about public drivers. This study is one of the first studies examining the predictors of public

drivers' rule violations and risky driving behaviors. Second, this study show that time pressure is the variable affecting participants' sense of rule violation at the multilevel model. This finding is important for policy makers and managers that are responsible for public drivers in their organization. These public drivers are frequently asked and required to transport persons or deliver official papers on time. In this sense, supervisors of public drivers should consider to take necessary steps to comfort drivers in terms of time pressure. Further, the descriptive statistics shows that about fifty percent of the participants are older than 40 years. In this sense, in addition to minimum eligibility requirements, public organizations can use standardized psychological tests to determine any emotional or mental conditions that may adversely affect the ability to exercise duties and well-being of candidates. Further psychological tests can be used for drivers who involve in an accident to identify the reasons causing traffic accidents.

Similar to any scientific study, this study also has several limitations. One of the limitations is related to measures of the study. In this study, instead of using participants' real life traffic violations, the study has utilized participants' self-reports on their sense of rule violations. Second, this study has used adapted measures from earlier studies. Instead of using all items, this study included some items from the measures considering time issue. Further research should examine risky driving behaviors and rule violations with measures including all possible items. Third, this study has measured only some facets of rule violations because of the same reason. Similarly, researchers may want to include other possible facts in their future research. Finally, more advanced statistical techniques like structural equation modeling can be utilize to develop a better model.

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Appendix

Variables	A/SA / %	M / SD	Factor Loading
Rule violation			
Sometimes it is necessary to bend the rules to keep traffic going	109 / 31	2.13 / .87	.82
Sometimes it is necessary to break the traffic rules in order to get ahead	95 / 27	2.06 / .82	.91
Sometimes it is necessary to bend the traffic rules to arrive in time	87 / 25	2.02 / .86	.85
Cronbach's Alpha			.83
Sensation Seeking			
I do avoid the competition in traffic (R)	61 / 18	1.62 / .98	.70
I keep sufficient following distance (R)	34 / 10	1.44 / .74	.80
I do avoid unnecessary risks (R)	35 / 10	1.41 / .75	.86
I conform to the speed limits (R)	55 / 16	1.65 / .83	.70
Cronbach's Alpha			.75
Aggressiveness			
I horn to indicate my annoyance	39 / 11	1.70 / .80	.83
When I get angry at a driver, I give a chase	24 / 7	1.31 / .76	.83
Cronbach's Alpha			.54
Assertiveness			
Drive fast to show others that I am tough enough	26 / 7	1.61 / .74	.95
Drive fast to show others I can handle the car	26 / 7	1.63 / .75	.95
Cronbach's Alpha			.88
Confidence in Driving Ability			
I am a fluent driver	263 / 75	2.98 / .90	.76
I can drive on a slippery road	267 / 77	2.94 / .82	.84
I can change the lane fluently in heavy traffic	196 / 56	2.59 / .91	.67
Cronbach's Alpha			.62
Time Pressure			
If I am too late, I start pacing up	66 / 19	1.99 / .77	.88
I feel strongly compelled to run on time	72 / 21	1.89 / .88	.88
Cronbach's Alpha			.71
Possibility of Being Caught			
It is less likely that drivers breaking the rules are caught by police	122 / 35	2.19 / .94	.91
It is less likely that drivers breaking the rules are caught by cameras	91 / 26	2.05 / .87	.91
Cronbach's Alpha			.79

R= Reverse; A/SA= Agree/Strongly Agree

