



Proceedings of the 9<sup>th</sup> APTE Conference  
6<sup>th</sup> - 8<sup>th</sup> August 2014, Mount Lavinia Hotel, Sri Lanka

**DRIVING BEHAVIOR: TRAFFIC RISK PERCEPTION AND INTENTIONS  
TO COMMIT DRIVING VIOLATIONS IN IRAN**

Zahra Tabibi  
Assistant Professor  
Ferdowsi University of Mashhad  
Email: tabibi@um.ac.ir

Hoda Hashemi Chahnoeei  
MS.c. in Psychology  
Department of Psychology  
Ferdowsi University of Mashhad  
Email: hodahashemi6788@yahoo.com

**ABSTRACT**

Road traffic injuries are the leading cause of death and injuries. Violation of traffic rules is one of the reasons for accident involvement. The aim of the current study was to predict aberrant driving behavior by traffic risk perception and intentions based on the Theory of Planned Behavior (TPB) constructs. A total of 100 students participated in the study. Three questionnaires were administered including Traffic Risk Perception Questionnaire, a TPB based Questionnaire and Driving Behavior Questionnaire. The results indicated that intention and behavioral attitude predicted aberrant driving behavior. Age, gender and traffic risk perception were non-significant. In conclusion, behavioural attitudes towards rule compliance were more important than traffic risk perception for performing aberrant driving behaviour. The implication is to increase positive attitudes towards compliance with traffic rules through educational programmes.

**Keywords:** attitudes, traffic, motivation, risk appraisal

**1. Introduction**

Globally, road traffic injuries (RTI) have become a serious public health concern. The rate of road crashes and the intensity of its adverse consequences are increasing over the years in developing countries including Iran. It is reported that during 1997 to 2005 in Iran, non-fatal RTI rate increased from 110 to 401 per 100,000 population. For fatal RTI rates, the rate increased from 22.1 to 40.5 during 1997 to 2005 per 100,000 population (Rasouli, Nouri, Zarie, Saadat and Rahimi-Movaghar, 2008). In Iran, road traffic deaths account for 10.3% of all deaths (Naghavi, et al., 2009) and 55% of all unintentional injury deaths (Akbari, Naghavi & Soori, 2006). This is higher than the global estimation of RTIs accounting for 2.1% of all deaths and 23% of all injury deaths (WHO, 2004).

In Iran there have been some improvements in road infrastructure and of vehicle safety. However, the third factor, i.e., human factor has been overlooked. In fact, one of the factors influencing the high rate of traffic accidents has been identified as human factors (Zavareh, 2009; Zavareh, et al., 2009). Poor traffic safety behaviours of road-users have been noted as the most important human barriers (Zavareh, 2009). These studies have reached a common conclusion that unacceptably low levels of compliance with traffic regulations are one of the main causes of RTIs. Exceeding the speed limits and dangerous overtaking are the most common driving violations among Iranian drivers (Tabibi, 2011; Zadeh, et al. 2002).

One of the psychological factors influencing driver behaviour is risk perception. Risk perception refers to the subjective experience of risk in potential traffic hazards (Deery, 1999). Risk perception comprises of three steps of processing; 1. perceiving and recognizing visible and hidden potential hazards in time, 2. appraising the seriousness of the hazards and 3. knowing how to act to avert the hazards (Nordfjrn, Rundmo, 2009). The first step processing is usually assessed by the time taken to detect traffic hazards, often termed hazard perception latency (Deery, 1999). The concept of risk appraisal refers to the second step of processing, and is supported by models of health behaviour. The



## Proceedings of the 9<sup>th</sup> APTE Conference 6<sup>th</sup> - 8<sup>th</sup> August 2014, Mount Lavinia Hotel, Sri Lanka

health-belief model (Rosenstock, 1974) proposes that preventive behaviour is more probable when individuals perceive that they are vulnerable to a particular risk item. Accordingly, it is plausible that individuals will behave carefully in traffic if they perceive that there is a high probability of a traffic accident occurring. The third step of processing involves perceived ability to prevent hazards into an accident. That is, people's beliefs about their ability to handle hazardous situations, and results from their self assessed driving ability (Deery, 1999). It is proposed that the ability to correctly perceive the risk involved in various traffic situations is required for safe driving behaviour. For example, traffic risk perception may help one to adjust his/her speed in accordance with this risk assessment (Nordfjrn, Rundmo, 2009).

Another psychological factor influencing safe driving behavior is the motivation and attitudes toward compliance with traffic rules. According to the theory of planned behavior (TPB, Ajzen, 1991) behaviour is determined by intentions. Intention refers to the motivation to perform a behaviour and is regarded as the most proximal determinant of actual behaviour. Further, intention is explained by the variables of attitude towards the behaviour, subjective norm and perceived behavioural control. Attitude towards the behaviour means the evaluation of the consequences of the behaviour; the benefits that the person feels are gained by performing the behaviour. Benefits could be instrumental (how much sooner do I get to my destination if I do not obey traffic rules?) or emotional (how enjoyable is not obeying traffic rules?). Subjective norm means the perceived social pressure to perform a behaviour. That is, the perception that a person has about the expectation of significant others for performing the behaviour. Perceived behavioural control (PBC) means people's perceptions of the degree of control they have over performing a behaviour. A high degree of perceived behavioural control and subjective norm and a positive evaluation of the behaviour lead to a strong intention to perform that behaviour (Ajzen, 1991). Studies on driving attitude have revealed the significance of the TPB in predicting various driving behaviours in various countries (Forward, 2008; Newman, Watson, & Murray, 2004; Paris & Van den Broucke, 2008; Simsekogçlua & Lajunen, 2008; Walsh, White, Watson, & Hyde, 2007).

The goal of the current study was to assess the ability of risk perception and TPB constructs including intentions, behavioural attitude, subjective norm and perceived behavioural control in predicting Iranian driving behavior. In the current study two components of risk perception were examined, namely, risk appraisal (step 2) and perceived driving skill (step 3). The aims specifically were to examine a. the relationship between aberrant driving behavior and perceived driving skill and risk appraisal; b. the relationship between aberrant driving behavior and intentions to commit driving violations; and c. the relationship between aberrant driving behavior and behavioural attitude, subjective norm and perceived behavioural control. These relationships will be examined after controlling for age, gender and driving experience. Note that the first component of risk perception was not examined in the current study because of technical and professional requirements for providing the hazard perception task.

### 1.2 Method

**Participants:** a total of 100 students from Ferdowsi University of Mashhad, Iran participated in the study. Mean age 27.4 and standard deviation of 6.1 years; mean years of driving experience 6.5 and SD of 0.5 years. There were 68 women and 32 men.

**Instruments:** three questionnaires were administrated as follows;

1. Driving Behaviour Questionnaire (DBQ): the 27<sup>th</sup> items of DBQ (Lajunen & et al. 2004) assessing four types of aberrant driving behavior, lapses, errors, violations and aggressive violations.
2. TPB based Questionnaire: A validated TPB questionnaire was designed. For this, a scenario was provided, illustrating a dangerous overtaking. Scenario was "You are driving on a rural road where the speed limit is 90 km/h. The time is 11.30 on a fine and dry day. On this section of the road there are a series of bends and the visibility is poor. In front of you is a lorry, which is being driven at 65

km/h. You have now been stuck behind this lorry for about 2 km and you have not met anybody in the last 5 min. You begin to be short of time and even if the view is still restricted, you pull out and start to overtake”. Individuals were asked to rate (between 1 and 7) the extent of their intention, attitude, perceived control, subjective norm, to drive like the one in the scenario for the next week.

3. Traffic Risk Perception (Rundom & Iversen, 2004; Nordfjrn, Rundmo, 2009): a 13 item questionnaire to assess traffic risk appraisal in various traffic situations and driving skill was administrated. These items measured perceived probability of personal injury due to various traffic related events. The measure was adopted from a questionnaire developed by Nordfjrn, Rundmo (2009). The five point scales were in Likert format and ranged from “No probability” to “Very high probability”.

### 1.3 Results

Means, standard deviations and correlation coefficients for demographic variables, risk perception and TPB constructs are presented in Table 1.

	1	2	3	4	5	6	7	8	9	Mean	SD
1.Age	1									27.4	6
2.Gender	0.30	1								-	-
3.Driving experience	0.66	0.47	1							63	61
4.Driving behaviour	0.09	0.20*	0.13	1						2.2	0.6
5.Perceived Driving skill	0.15	0.31*	0.46*	0.01	1					7.1	2
6.Risk appraisal	0.18	0.13	0.26*	0.07	0.06	1				3.1	0.8
7.Intentions	0.03	-0.02	-0.14	-0.27*	-0.09	0.19*	1			11.8	3.8
8.Behavioural attitude	0.02	-0.04	-0.03	-	-0.13	0.23*	0.68*	1		20.5	7.2
9.Subjective norm	-	0.08	-0.04	0.04	0.004	0.13	0.73*	0.46*	1	12.3	2.9
10.Perceived behavioural control	0.02	-0.16	-0.10	-	0.08	0.25*	0.36*	0.71*	0.31*	9.8	4.1

\*p < 0.05, \*\*p < 0.01

With choosing 95% confidence intervals, Table 1 shows that gender was significantly related to driving behavior, perceived driving skill. Male scored higher than women in aberrant driving behavior (male: Mean = 2.4, SD= 0.6; female: Mean = 2.1, SD = 0.6) and perceived driving skill (male: Mean = 8.0, SD= 1.9; female: Mean = 6.6, SD = 2.0). Higher driving experience related significantly to higher perceived driving skill and risk appraisal. Higher scores in aberrant driving behavior was related significantly to lower scores in intention, behavioural attitude, perceived behavioural control for not committing dangerous overtaking.

Higher scores in risk appraisal was significantly related to higher scores in intention, behavioural attitude, perceived behavioural control for not committing dangerous overtaking. Though, the relationships have quite low correlation coefficients. Intention to committing dangerous overtaking was significantly related to behavioural attitude towards dangerous overtaking, subjective norm and perceived behavioural control.

Next a four steps hierarchical regression, with Enter model was computed with aberrant driving behavior as criterion. The hierarchical multiple regression analysis was conducted first to determine the role of the risk perception variables in predicting aberrant driving behaviour after controlling for

age, gender and driving experience, and second to test that intention can predict aberrant driving behavior after the effects of the risk perception and demographic features have been controlled, and third, to test that TPB constructs can predict aberrant driving behavior after the effects of intention, risk perception and demographic features have taken into account.

For this, in the first step, age, gender and driving experience, in the second step, perceived driving skill and risk appraisal, in the third step, intention and in the four step behavioural attitude, subjective norm and perceived behavioural control were entered. The results are presented in Table 2.

Table 2: Summary hierarchical regression analysis for variables predicting aberrant driving behaviour

	$\beta$	t	R <sup>2</sup>	F	R <sup>2</sup> <sub>change</sub>	F <sub>change</sub>
Age	0.05	0.03	0.03	1.2		
Gender	0.15	1.2				
Driving experience	0.07	0.04				
Perceived driving skill	0.03	0.3	0.04	0.8	0.007	0.3
Risk appraisal	-0.08	-0.8				
Intention	-0.31**	-3.01	0.13	2.2*	0.09	9.1**
Behavioural attitude	-0.55***	-3.2	0.30	4.3*	0.17	7.4***
Subjective norm	0.19	1.8				
Perceived behavioural control	-0.18	1.3				

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Table 2 shows that the models in the first and second steps of multiple regressions were not significant. Demographic features and risk perception did not predict aberrant driving behavior. The third step, intention was negatively significant accounting for 9% of the variance. In the fourth step, the significant variable with beta coefficients of 0.55 was behavioural attitude. The TPB variables could account for 17% of the aberrant driving behaviour variance ( $F_{\text{change}} = 7.4$ ,  $df=3,89$ ,  $p < 0.001$ ). In total, 30% of aberrant driving behaviour variance was explained by age, gender, driving experience, risk appraisal, perceived driving skill, intention, behavioural attitude, subjective norm and perceived behavioural control.

#### 1.4 Discussion

The aim of the current study was to determine the aberrant driving behaviour of Iranians by components of risk perception and TPB constructs. The results of simple correlations indicated that aberrant driving behaviour related to gender with males reporting higher rate of aberrant driving behaviour. Also, aberrant driving behaviour was significantly related to intentions to do dangerous overtaking, behavioural attitude towards dangerous overtaking and perceived behavioural control. These results was consistent with various studies' results indicating gender difference in committing traffic violations (Westerman & Haigney, 2000; Wickens, Toplak, Wiesenthal, 2008).

The results of the multiple regression analysis showed that after controlling for age, gender and driving experience, neither components of risk perception could predict aberrant driving behaviour.



## Proceedings of the 9<sup>th</sup> APTE Conference 6<sup>th</sup> - 8<sup>th</sup> August 2014, Mount Lavinia Hotel, Sri Lanka

After controlling for demographic features and risk perception, the construct of intentions to do dangerous overtaking significantly explained aberrant driving behaviour as much as 10%. All the variables of the TPB were responsible for 30% of the explained variation in aberrant driving behaviour. The only significant variable was behavioural attitude towards dangerous overtaking, having a unique contribution of 55% ( $\beta$  coefficient = -0.55) for the variance of aberrant driving behaviour when taking the variance of the other variables of the TPB model, risk perception components, age, gender and driving experience into account.

These results indicate that drivers who hold positive attitudes for overtaking in a dangerous situation and have strong intention to do that are those that reports committing various driving errors and violations. These results point to the significance of motivation and attitudes in determining aberrant driving behaviour, supporting the theory of planned behaviour (Ajzen, 1991). The results are consistent with the results gained in Iversen's (2004) study. Iversen (2004) measured attitude and risky driving behaviour at two data collection points. Attitudes measured at Time 1 significantly influenced risky driving behaviour measured at Time 2 of the survey.

The non-significance of the risk perception components, that are risk appraisal and perceived driving ability, is consistent with the results of Rundo and Iversen's (2004) study. They did not also find a significant relationship between risk perception and aberrant driving behavior.

Scores for traffic violations were low and intentions to comply scores were quite high. Sampling bias and/or response bias could be noted. Given the possibility of socially desirable responses in self-reported measures, there might be a response bias. This could be accounted as a limitation for the current study. This, however, may have occurred because a large number of participants were women. Gender difference in aberrant driving behavior is well demonstrated in the literature (Tabibi, 2011; Westerman & Haigney, 2000; Wickens, Toplak, Wiesenthal, 2008). Therefore it is recommended to do further research on the relationship between risk perception and aberrant driving behavior considering gender differences.

In conclusion, these data add to the already considerable body of evidence supporting the role of intentions and attitudes in predicting aberrant driving behaviour.

The implication for the result is to increase motivation to comply with traffic rules. According to Ajzen (1991) a positive evaluation of the behaviour leads to a strong intention to perform that behaviour. Therefore providing messages on the positive evaluation of complying with traffic rules may help in changing motivation and behavior in consequence.

## 2. REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organization Behavior and Human Decision Processes*, 50, 179-211.
- Akbari, M. E., Naghavi, M., & Soori, H. (2006). Epidemiology of deaths from injuries in the Islamic Republic of Iran, *Eastern Mediterranean Health Journal*, 12, 3/4, 382-390.
- Deery, H.A. (1999). Hazard and risk perception among young novice drivers, *Journal of Safety Research*, 30, 4, 225-236.
- Forward, S. (2008). *Driving violations: Investigating forms of irrational rationality*, Acta Universitatis Upsaliensis. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences 44. 78 pp. Uppsala. ISBN 978-91-554-7319-8.
- Iversen, H. (2004). Risk-taking attitudes and risky driving behaviour. *Transportation Research Part F*, 7, 2004, 135-150.
- Lajunen, T., Parker, D., Summala, H. (2004). The Manchester Driver Behaviour Questionnaire: A cross cultural study, *Accident Analysis and Prevention*, 36, 231-238.
- Naghavi, M., Shahraz, S., Bhalla, K., Jafari, N., Pourmalek, F., Bartels, D., Puthenpurakal, J. A, & Motlagh, M. E. (2009). Adversed health outcomes of road traffic injuries in Iran after rapid motorization. *Archives of Iranian Medicine*, 12, 3, 284-294.



**Proceedings of the 9<sup>th</sup> APTE Conference**  
6<sup>th</sup> - 8<sup>th</sup> August 2014, Mount Lavinia Hotel, Sri Lanka

- Nordfjrn, T. & Rundmo, T. (2009). Perceptions of traffic risk in an industrialised and a developing country, *Transportation Research Part F: Traffic Psychology and Behaviour*, 12, 91–98.
- Paris, H. & Van den Broucke, S. (2008). Measuring cognitive determinants of speeding: An application of the theory of planned behaviour. *Transportation Research Part F: Traffic Psychology and Behaviour*, 11, 168-180.
- Rundmo, T. & Iversen, H. (2004). Risk perception and driving behaviour among adolescents in two Norwegian counties before and after a traffic safety campaign. *Safety Science*, 42, 1–21.
- Simsekog̃lu, O., & Lajunen, T. (2008). Social psychology of seat belt use: A comparison of theory of planned behavior and health belief model, *Transportation Research Part F: Traffic Psychology and Behaviour*, 11, 181–191.
- Tabibi, Z. (2011). Risky driving behavior relating to accident involvement: Investigating some identified factors in an Iranian sample. *IPA International Journal of Psychology*, 5(2), 51-72.
- World Health Organisation (2004). *World report on road traffic injury prevention*, World Health Organisation, Geneva.
- Walsh, S.P., White, K.M., Watson, B. & Hyde, M.K. (2007). Psychosocial factors influencing mobile phone use while driving. *Australian Transport Safety Bureau*, No. RSRG 2007-06.
- Westerman, S. J. & Heigeny, D. (2000). Individual differences in driver stress, error and violation, *Personality and Individual Differences*, 29, 981-998.
- Wickens, C. M., Toplak, M. E. & Wiesenthal, D. L. (2008). Cognitive failure as predictors of errors, lapses and violations, *Accident Analysis and Prevention*, 40, 1223-1233.
- Zadeh, H. S., Vahabi, R., Nazparvar, B., Amoei, M. (2002). An epidemiological study and determination of causes of traffic accident-related deaths in Tehran, Iran (during 2000-2001). *Journal of Clinical Forensic Medicine*, 9, 74-77.
- Zavareh, D.K. (2009). *Toward safety promotion among road users: Epidemiology and prevention of road traffic injuries in Iran*, Karolinska Institutet, Stockholm.
- Zavareh, D.K., Mohammadi, R., Khankeh, H., Laflamme, L., Bikmoradi, A., & Haglund, B.J.A. (2009). The requirements and challenges in preventing road traffic injury in Iran. A qualitative study. *BMC Public Health*, 9, 486, doi:10.1186/1471-2458-9-486.