

## **The Role of Control Source and Risk Perception in Predicting Driving Behavior of Young Taxi Drivers in Karaj**

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### ***Abstract***

The purpose of this study was to investigate the role of control source and risk perception in predicting the behavior of taxi drivers in Karaj. The research method was descriptive-correlation. The statistical population of this study was all 718 young taxi drivers in the city of Karaj. According to the Cochran formula at the level of 0.05, 250 young taxi drivers in Karaj were selected by available method. Data gathering tool was Manchester Driving Behavior Questionnaire, Rutter Control Source Questionnaire and Randemo and Avereson Risk Perceptions Inventory. Data were analyzed using Pearson correlation and linear regression and stepwise regression. The findings showed that there is a significant relationship between control source and risk perception with driving behavior of young taxi drivers, and the control source, risk perception, and personality traits are predictive of driving behavior of young taxi drivers which these results point to cognitive and excitement emphasis in social normative behaviors.

***Keywords:*** Source of control, Risk perception, Driving behavior, Young taxi drivers.

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## 1. Introduction

Road accidents happened 90% because of human factors, 6% due to vehicle problem, 3% coming from road and environment and 1% from the whole system (Lewin, 1982; Rumar, 1985; Özkan & Lajunen, 2004). This data particularly implying that there are various factors that contribute for the occurrence of accidents on the road but human factors still covered the highest percentage of vehicular accidents. Personality traits, as part of mentioned human factors, were already studied in some researches (Fine, 1963; Carpentiera, Brijs, Corr and Matthews, 2009; Thørrisen, 2013; Declercq, Daniels and Wets, 2014) as predictors of road accidents and risk driving.

They have mentioned that extraversion and neuroticism are significant predictors of accidents while agreeableness and conscientiousness have strongest correlations with safety. However, there are still few studies and findings in which personality trait extraversion predicts risky driving behaviors.

Adopting Eysenck's (1969), extraversion is characterized primarily by sociability and impulsiveness but also by jocularly, liveliness, quick-wittedness, optimism and other traits indicative of people who are rewarded for their association with others (Feist & Feist, 2006).

According to theories of Eysenck (1957) and Gray (1970), extraversion is primarily believed having higher threshold of arousal in ascending reticular activating system (ARAS). These theories serve as the guide in understanding extraversion in the areas of cognition, affection and behaviors in relation to risk-driving on the road.

As stated, there are few studies (Hansen, 1988; Corr et. al. 2009; Thorisen, 2013) that would account extraversion as a strong predictor of road accidents. However, there are also studies (Rozario, Mark and Lewis, Ioni and White, Katherine Marie, 2010; Žitný and Halama, 2011) inferred that extraversion is not a significant predictor of risk-driving and looked at the positive qualities of being optimistic and confident on their own potentials as individual. In the study of Rozario et al., (2011), it is suggesting that personality construct (extraversion) may influence attitudes or control perceptions but not directly influencing certain behavioral outcomes (Ajzen, 2009) which led to assume

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that other factors is added to strengthen or weaken the flow of relationship. With that, this current study is an extension to researches about extraversion predicting risky driving behaviors while exploring another factor that influences the relationship which is the internal and external locus of control of an individual focusing on traffic situations.

## **2. Review of Literature**

### **2.1. Understanding Risky Driving Behaviors**

Eysenck (1957) started extraversion in his experimental and psychometric works with the belief that it starts with the idea of inhibition and excitation that produce or extinct certain behaviors. His work led to the development of arousal hypothesis of extraversion implying that extraverts have higher threshold for arousal in the ascending reticular activating system (ARAS) (Wilt & Revelle, 2008). This infers that extraverts tend to act faster than introverts to increase their arousal and they tend to seek arousal in various activities (Wundt & Judd, 1897; Wilt et. al., 2008) due to their need of greater stimulations from the environment (Ewen, 2013).

This idea of Eysenck was in some way adopted by Gray (1970) in discerning and explaining extraversion by introducing reinforcement sensitivity theory (RST). This theory suggests that person's arousal moderation by positive or rewarding stimuli provided by the environment and heredity and particularly allows the functions of two brain systems: behavior approach system (BAS) that mediates novelty-, sensation- and thrill-seeking and behavior inhibition system (BIS) that mediates anxiety (Pickering and Gray, 1999Dumont, 2010).

However, some studies have found that this arousal is not always positive or negative (Matthews and Gilliland 1999; Zuckerman 2005; Corr & Mathews, 2009) but also moderated by the type of situation that the individual is currently in. They suggest that it tend to vary depending on the reward properties of the situation given to the individual.

These theories are explaining the role of extraversion to the occurrence of possible risky driving behaviors on the road from tolerant (e.g. not wearing seatbelt, texting) to severe (e.g. over speeding) actions done by drivers. Due to

the positive sensation that extraverts feel in seeking for stimulations from the environment (Thørrisen, 2013) that fill the threshold for arousal as well as the reinforcement that it gives to their affect, these drivers become disinhibited to depict risky behaviors because they are more perceiving the rewards from it rather than the possible threat it may cause to his/her life (Wright 2006; Wilt et al., 2009; Ewen, 2013).

## **2.2. Relationship between Traffic Source of Control and Risky Driving**

The control source by Julian Rotter (1954), also known as internal and external control of reinforcement from his social learning theory which suggested that both the situation and the person contribute to feelings of personal control (Feist & Feist, 2006). In his theory, individual who has higher internal source of control believes that things that are happening around them and the causal of their behavior are due to their own effort (e.g. skills, talents and knowledge).

Contrary to the aforementioned results, there are also studies (Arthur and Doverspike, 1992; Özkan et al., 2004) arrived at a conclusion that individuals scored high on internal factor.

From these findings, Carpentiera et al., (2014) and Özkan et. al., (2004) suggested that source of control is not a standalone construct predicting road accidents and risky driving behaviors but there are other factors included in the relationship. As for this current study, traffic source of control used as the other factor influencing the involvement or avoidance of the driver to portray risky driving behaviors on the road.

## **2.3. Interaction between Extraversion and Traffic Source of Control**

Other researches also investigated extraversion coincides with the inclination of a certain individual to possess a belief of source of control. In a study made by Žitný and Halama (2011), they found out that extraverts perceived to be confident on their own potentials and possessed higher self-esteem that allow them to believe in their own control. It serves as a motivation for them to outperform in social situations because power, status and social contact aroused them (Olson & Weber, 2004; Wilt et al., 2008).

Though there are more assumptions suggesting that extraversion is related to internal source of control (Parkes & Rendall, 1988; Žitný, 2011) and there is also a need to remember that extraverts tend to seek external stimulation coming from the environment (Ewen, 2013) which they may perceive reward rather than a possible threat.

Nevertheless, Feist (2006) mentioned that excessive inclination to either internal or external source of control can be maladaptive for an individual which can be seen in one's behaviors.

### **3. Methodology**

The research method was descriptive-correlational, which according to the classification of research and on the basis of the purpose of the research type was considered as a point of time. The statistical population of the study consisted of 718 young taxi drivers in the city of Karaj.

In order to select a sample based on the Cochran formula table at the level of 0.05, 250 young taxi drivers in Karaj were selected. Data were collected based on Manchester Driving Behavior Questionnaire (MDBQ), Rutter Control Source Control Questionnaire (RLOC), and Randemo and Aubusson Risk Perception Inventory (2004).

The Manchester Driving Behavior Inventory (MDBQ) contains 50 questions and is in a Likert scale of 1 to 5 ratings and has two general factors for errors and violations. The error factor itself has two subsamples of landslides of error and mistakes, and the factor of violations also has two subsamples of intentional violations and unwarranted violations; therefore, in this questionnaire, all abusive behaviors consisted of four categories: inaccurate errors, mistakes, intentional violations, and misconduct unanimous.

The results of the reliability analysis showed that all four factors of this scale have many internal consistency coefficients (slip: 0.77, errors 0.81, deliberate violations: 0.86, unauthorized violations: 0.65). (Driving behavior questionnaire can be used as a valid tool in driving behavior research.

The Ruthor's Source Control Questionnaire (RLOC) has been developed to measure the expectations of people in the control source, which has 29 items. This sum of scores will be obtained from questions other than 6 deviant

questions and the total score of each person indicates its degree. Average and median are 8.84 and 8 respectively.

The Randemo and Aubusson Risk Perception Questionnaire (2004) has 8 questions and its purpose is to perceive an individual from the overall negative effect of the process of action, based on the assessment of homogeneous negative processes and the probability of occurrence of this outcome.

Descriptive statistics including frequency, graph, mean, and standard deviation were used to analyze the collected data. Also, for analyzing the hypotheses, correlation coefficient and stepwise regression analysis were used. Meanwhile, data analysis was performed using SPSS software version 18.

**Table 1. Results of the Kolmogorov-Smirnov test**

| Main variables            | Value of Kolmogorov-Smirnov | Significance level |
|---------------------------|-----------------------------|--------------------|
| Slip                      | -0.123                      | 0.132              |
| Intentional violation     | -0.546                      | 0.132              |
| Mistakes                  | -0.799                      | 0.132              |
| Incontinental misconduct  | -0.400                      | 0.132              |
| Control source            | -0.544                      | 0.132              |
| Risk based on knowledge   | -0.445                      | 0.132              |
| Emotional risk perception | -0.925                      | 0.132              |
| Worried                   | 0.857                       | 0.132              |
| Risk perception           | 0.817                       | 0.132              |

According to Table 1 and the values obtained from the Kolmogorov-Smirnov (K-S) test, the distribution of all variables is normal with respect to a significant level greater than 0.05. Regarding the normalization of the data requirements for the use of parametric tests, Pearson correlation method is used to determine correlation

Hypothesis 1: The source of control plays a role in predicting the driving behavior of young taxi drivers in Karaj.

**Table 2. Pearson correlation coefficients matrix between control source and driving behavior of young taxi drivers**

| Variable                 | 1       | 2      | 3      | 4      | 5      | 6 |
|--------------------------|---------|--------|--------|--------|--------|---|
| Source f Control         | 1       |        |        |        |        |   |
| Slip                     | -0.29** | 1      |        |        |        |   |
| Intentional violation    | -0.31** | 0.42** | 1      |        |        |   |
| Mistakes                 | -0.28** | 0.56** | 0.48** | 1      |        |   |
| Incontinental misconduct | -0.33** | 0.44** | 0.39** | 0.39** | 1      |   |
| Driving behavior         | -0.30** | 0.44** | 0.63** | 0.62** | 0.49** | 1 |

\*\* It is significant at level 0.01. \* It is significant at level 0.05.

The results in Table 2 show a significant correlation between the control source and driving behavior of young taxi drivers and, in part, between the control source with slip (0.29), intentional misconduct (0.31), errors (0.28), negligent misconduct (0.33) and driving behavior (0.20), there is a significant inverse relationship.

**Table 3. Summary of ANOVA findings for predicting driving behavior (criterion variable) based on control source (predictor variables)**

| Indicator         |            | Sum of squares | Degrees of freedom | Average squares | F      | Meaningful |
|-------------------|------------|----------------|--------------------|-----------------|--------|------------|
| Source of control | Regression | 2481.243       | 1                  | 2481.243        | 19.634 | 0.000      |
|                   | Left over  | 9543.634       | 247                | 38.638          |        |            |
|                   | Total      |                | 85.632             | 248             |        |            |

The results presented in Table 3 are significant in terms of the variance analysis value.

**Table 4. Multiple correlation coefficient**

| Predictive variables | Multiple correlation coefficients | Standardized beta factor | Squared multiple correlation coefficient R <sub>2</sub> | Modified multiple correlation coefficient squared | Estimated error | Coefficient T | Meaningful | Watson Camera | Tolerance | VIF |
|----------------------|-----------------------------------|--------------------------|---|---|-----------------|---------------|------------|---------------|-----------|-----|
| Source of control    | 0.424                             | -0.310                   | 0.198   | 0.187   | 5.49            | 5.875         | 0.000      | 1.720         | 1         | 1   |

Also, according to the values obtained from (Beta) from the source control (-0.310), they have the greatest effect on driving behavior. The Watson camera was also used to determine the difference between the actual values and the predicted values with the regression model, which was 1.720, indicating that the errors was independent in the range of 1 to 3. In VIF values in all directions and variables, there is no inflationary variance and also high coefficient of tolerance. As a result, the high tolerance coefficient and low variance inflation indicate that the regression model is inconsistent and appropriate.

Second hypothesis: Risk perception plays a role in predicting driving behavior of young taxi drivers in Karaj.

**Table 5. Pearson correlation coefficients matrix between control source and driving behavior of young taxi drivers**

| Variable                  | 1       | 2       | 3       | 4       | 5      | 6      | 7    | 8 |
|---------------------------|---------|---------|---------|---------|--------|--------|------|---|
| Risk based on knowledge   | -0.27** | 1       |         |         |        |        |      |   |
| Emotional risk perception | -0.21** | -0.23** | 1       |         |        |        |      |   |
| Worried                   | -0.24** | -0.29** | -0.23** | 1       |        |        |      |   |
| Risk perception           | -0.26** | -0.24** | -0.21** | -0.29** | 1      |        |      |   |
| Slip                      | -0.27** | -0.19** | -0.19** | -0.24** | 0.42** | 1      |      |   |
| Intentional violation     | -0.29** | -0.27** | -0.29** | -0.28** | 0.56** | 0.48** | 1    |   |
| Mistakes                  | -0.19** | -0.29** | -0.22** | -0.24** | 0.47** | 0.39** | 0.39 | 1 |

\*\*It is significant at level 0.01. \*It is significant at level 0.05.

The results of Table 5 show a significant correlation between risk perceptions and driving behavior of young taxi drivers and partly between risk perceptions with slip (0.29), intentional misconduct (0.24), errors (0.28), Negligence (0.24) and driving behavior (0.28) and finally there is a significant inverse relationship.

**Table 6. Summary of ANOVA's findings for predicting driving behavior (criterion variable) based on risk perception (predictor variables)**

| Indicator         |            | Sum of squares | Degrees of freedom | Average squares | F      | Meaningful |
|-------------------|------------|----------------|--------------------|-----------------|--------|------------|
| Source of Control | Regression | 8641.964       | 1                  | 8641.964        | 17.534 | 0.000      |
|                   | Left over  | 9574.210       | 244                | 39.238          |        |            |
|                   | Total      | 3412           | 245                |                 |        |            |

The results presented in Table 6 are significant in terms of the variance analysis value. Driving behavior prediction is based on cognitive risk at the level of 0.01.



**Table 7. Multi-correlation coefficient of stepwise regression**

| Predictive variables    | Multiple correlation coefficients | Standardized beta factor | Squared multiple correlation coefficient $R_2$ | Modified multiple correlation coefficient squared | Estimated error | Coefficient T | Meaningful | Watson Camera | Tolerance | VIF |
|-------------------------|-----------------------------------|--------------------------|--|---|-----------------|---------------|------------|---------------|-----------|-----|
| Risk based on knowledge | 0.412                             | -0.328                   | 0.289  | 0.248   | 2.91            | 6.412         | 0.000      | 1.831         | 1         | 1   |

Based on the results presented in Table 7, cognitive risk (0.248) has been exclusively and additively contributing to driving behavior prediction. Also, based on the obtained values of (Beta) of cognitive risk (-0.328), they have the greatest effect on driving behavior. The Watson camera was also used to determine the difference between the actual values and the predicted values with the regression model, which was equal to 1.831, indicating that the errors were independent of the range between 1 and 3. In VIF values in all directions and variables, there is no inflationary variance and also high coefficient of tolerance. As a result, the high tolerance coefficient and low variance inflation indicate that the regression model is inconsistent and appropriate.

#### 4. Conclusion

According to the results, it can be stated that, according to the behavioral viewpoint, Organism is used to learn behavior that does not have any risk or detriment to it. In the case of gain, both internal and external dimensions increase the transplant between the stimulus and the response. Also, from the perspective of others who do not observe social rules in this regard, they are subjected to the consequences of obtaining such reinforcements as peoples' self-expression, the sense of pride and pleasure that result from unwritten behavior towards social standards in the area of driving. In general, the conditionalization of the actor has also taken place, which results in the consequences of failure or performance of reinforcements. Also, in another

direction, based on the socio-cultural viewpoint and in the field of sociology, this connection with the circle of peers is based on the Hirschi's theory, which leads to individuals' rules in society. Whenever a social bond becomes weak, deviations will be probable. Empirical research, which is based on the theory of social bonding, has confirmed the effect of poor social linkage on deviation. The results of this study are consistent with the research by Vakibambe Isak (2004), and also according to the behavioral approach, the field of lawmaking is created through the rules of learning and penalties and positive and negative financings. According to the results, the source of control plays a role in predicting the driving behavior of young taxi drivers in Karaj. The first hypothesis of the research was confirmed. These results are consistent with the findings of other studies conducted in Iran and abroad. (Mousavian and Safari, 2009; Hatami et al. 2010; Sadeghi and Khairkhahzadeh, 2011; Maskal et al. 2012; Salmana et al. 2012; Gurosi and Anjom, 2013; Baku, 2013; Ahmadi et al. 2014; Iglesias et al. 2014).

In order to explain the findings of risk perception, it can be said that in the case of some people, according to the behavioral view, the rewards of risky activities overcome any probable punishment, and these individuals are more likely to get more excitement due to social reinforcement from peer groups based on the theory of interaction and social exchange in the cultural-social approach or cognitive introspection based on a cognitive perspective, such as a sense of pleasure. Ultimately, drug addiction tends to be at risk; however, this rule is not necessarily true for people with a lot of excitement, because the excitement is not the main source of motivation for these people and they are trying as much as possible, the probability of an outbreak minimize the risk by taking precautionary measures. According to the obtained results, risk perception plays a role in predicting the driving behavior of taxi drivers in Karaj, and the second hypothesis of the research is confirmed. These results are consistent with the findings of Elson Potter et al. 2001; Tracy et al. 2006; Donald and Roemer, 2010; Hack et al. 2010; Alizadeh et al. 2011; Mascal et al. 2012; Salmana et al., 2012; Iglesias et al. 2014; Brown et al. 2014; Elderiminer et al. 2016.

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