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Original

Investigating the Effect of Emotional Intelligence Components on Driving Errors

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Abstract

Background: Driving accidents are global challenges, especially in developing countries, that have been introduced by the World Health Organization (WHO) as one of the significant reasons for endangering human health. The most important reasons for driving accidents are the behavior and psychological characteristics of the vehicle driver. Aberrant driving behavior is considered as a major cause of driving accidents. The present study aimed the present study aimed to investigate the effect of emotional intelligence on driving errors. **Methods:** In the present research, 69 young students aged 20-35 years with a driving license were subjects of the study which had at least one-year driving experience and were assessed with the use of Bar-on emotional intelligence (EQ-i) questionnaire (90 questions) and valid Manchester Driving Behavior Questionnaire (MDBQ). Data analysis was conducted by SPSS version 20, descriptive tables, and Pearson correlation coefficient. **Results:** Data analysis indicated that the mean score of emotional intelligence of the tested subjects was 329/62, and the maximum rating of individual errors was related to slips with the score of 21/04. Also, the mean score of their driving behavior was 50/97. There was a significant inverse relation between sub-components problem solving, independence and self-actualization, and driving errors. **Conclusion:** Based on the obtained results of this study, it can be concluded that emotional intelligence and its components affected driving errors. This meant that persons with lower levels of emotional intelligence would be more involved in driving errors.

Keywords: Emotional Intelligence; Driving Errors; Driving Accident

Introduction

Driving accidents are global challenges, especially in developing countries, that have been introduced by WHO as one of the major reasons for endangering human health.[1] Several studies examined the death caused by car accidents in men, especially young persons who were driving cars, motorcycles, or pedestrians in developing countries.[2, 3] Concerning the increase in the rate of vehicle production, car sales, and lack of safety in the same proportion, the damages caused by lack of balance were estimated to be approximately five hundred thousand million dollars annually, including financial damages, life damages, and hospital costs.[3] According to the WHO report, driving accidents were the third leading cause of death in 2012 in Iran.[4] The most important reasons for driving accidents were the behavior and psychological characteristics of vehicle drivers.[5] Aberrant driving behavior was considered as a major cause of driving accidents.[3] Driving errors were the main subjects of the researchers for a long time in the field of road safety, and a wide range of measurement methods was designed for them, most of which include driving behavior questionnaires. Estimates showed that human errors were responsible for 95% of

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driving accidents.[6] There are numerous definitions for the word "error." In the present study, the error means a deficit in planned actions to achieve the desired result without the involvement of chance factors or unpredictable factors. Errors have different psychological roots. Errors occur as a result of difficulties in processing information, while deficits can have a major motivation factor.[7] Driving is a multi-system task and requires the ability to receive information through sensory, processing, right decision making, and responding to them, which is ultimately implemented through muscular activities.[8, 9]

In 1990, Reisen proposed the theory of error mechanisms, which included mechanisms such as cognitive error actions (executive functions) and decision-making errors (for example, perception and attention), observational errors (such as memory and reminder), information retrieval errors, and offenses (such as planning).[3] Driving errors are often classified as unintentional slips and offenses such as going to wrong paths and errors that are taken place in planning, such as speeding and running a red light.[10] Personality Factors affect the manner of individuals' driving and aberrant driving. The reasons for driving accidents are predictable. Determining the role of individual differences in creating aberrant driving behaviors may be effective in evaluating and assessing driving accidents of individuals. Drivers' state of mind depends on emotion regulation skills while driving. These researches mentioned that individuals with emotional intelligence were more successful at controlling anger and expressing their emotions. Also, it was clear that their tendencies in appearing aberrant behaviors could be associated with their emotional intelligence. So, higher emotional intelligence in drivers was able to eliminate aberrant driving behaviors.[11] Emotional intelligence can be explained as the ability to perceive one's feelings and others, to have flexibility to enhance feelings and intellectual growth. Emotional intelligence is essentially known as the focus of recognizing, evaluating, expressing, and managing one's and others' emotions.[12] This is also one set of social and emotional capabilities that contribute persons to cope with the everyday demands of life.[13] In 1920, Thorndic mentioned another concept whose content was the ability to perceive one's own and others' inner states, motivations, behaviors, and proper performance.[14] According to Martiner, emotional intelligence is a set of non-cognitive skills and abilities and capacities of individuals that increase the individuals' capacity to cope with life's pressures.[15] Van Wery et al. stated the concept of emotional intelligence as a set of verbal and nonverbal abilities that led the individuals to able to generate, express, perceive, and evaluate their own and others' emotions to guide, think, and successful actions against environmental pressures.[16] Emotional intelligence is a multidimensional concept. Researchers preferred to consider emotional intelligence as a factor that had the potential in attitude, performance, and effective positive results .[17]

Emotional intelligence is considered as a set of emotional and mental skills that can help each person. Detecting and perceiving one's own and others' emotions will also help enhance an individual's capabilities for self-control.[18] Studies exhibited that persons with high emotional intelligence enjoyed better mental health, job performance, and leadership skills.[19] Understanding feelings as well as expressing them is an important predictor of aberrant driving, and negative feelings appear while driving.[11] Our behavior is formed by different behavioral systems, each of which is a set of habits achieved based on internal or intrinsic factors. The driver should be assessed in terms of emotional, mental, and personality traits to understand whether the person can accurately measure the process of interpreting and evaluating information and is appropriate for driving.[20] Therefore, concerning the high number of accidents in the world, especially in developing countries, and since the main factor of accidents are human errors, it is required to examine the human personality factors, including emotional intelligence. Moreover, due to the high rate of road driving accidents among young drivers, it is necessary to review the youth behavior, including the social aspects of driving and the fundamental elements of its skills[21] completely. Concerning the fact that the issue of emotional intelligence can be promoted through training, it is supposed to investigate and consider more the effective personality factors for human behaviors, one of which is emotional intelligence.

Methods

Sixty-nine young students aged 20-35 were selected randomly as the research participants and had at least one-year driving experience. They were asked to answer the standard Bar-on emotional intelligence (EQ-i) questionnaire and valid Manchester Driving Behavior Questionnaire (MDBQ). Among them, 29 women and 40 men completed the questionnaires.

Specifications of Data Collection Tool

1. Bar-on emotional intelligence (EQ-i) questionnaire

This questionnaire was used to assess emotional intelligence and included questions that studied the individuals' feelings, ways of thinking, and behavior. After reading each question, the individual answered its coordination or non-coordination rate with described traits on five point-Likert scale, and in some questions with reversed content. The total score of 9 on each scale was equal to the sum of the scores of each of the questions on that scale, and the total score of the test was equal to the sum of the scores on 15 scales. Scoring more points in this test indicated more success on the desired scale or the overall test score and vice versa. This questionnaire was designed for individuals older than 18 years and was applicable for both men and women, on the condition that they have at least a diploma degree.[22] Bar-on emotional intelligence (EQ-i) questionnaire consisted of 90 overall questions with five main components and 15 sub-components. These components and sub-components are as follows: 1. the interpersonal skills component that includes courage, self-esteem, emotional self-awareness, self-actualization, and independence. 2. The interpersonal skills component that provides for empathy, social commitment, and interpersonal relationships. 3. Stress control that has the sub-components of stress tolerance and impulse control. 4. The consistency that has the sub-components of flexibility, problem solving, and realism. 5. The public creation component that consists of sub-components of happiness and optimism. Test reliability was reported 93% for the whole test through the calculation of Cronbach's alpha rate.[23]

2. Manchester Driving Behavior Questionnaire (MDBQ)

The questionnaire consisted of 50 questions and was used to determine different aberrant driving behaviors from different dimensions (slips, intentional offenses, errors, unintentional offenses). The questionnaire was designed using a five-point Likert scale. Arizi et al. determined the validity and reliability of the questionnaire by statistical tests (2010). The results of exploratory factor analysis differentiated four factors such as slips, errors, intentional offenses, and unintentional offenses. The results revealed that four factors of this scale enjoyed many internal consistency coefficients (slip: 0.77, intentional offenses: 0.86, unintentional offenses: 0.65, errors: 0.81).[24]

Results

The study participants were in the age range of 20 to 35 years, and most of them were men. The majority of participants had an MA degree or higher. Moreover, half of the participants had a previous history of driving accidents.

Table 1. demographic characteristics of participants in the study

Row	Variable	Level of variable	Number	Percentage
1	Age(Year)	22.5	36	52.2
		27.5	21	30.4
		32.5	12	17.4
2	Gender	female	29	42
		male	40	58
3	Marital status	single	62	89.9
		married	7	10.1
4	Education	BA	15	21.7
		MA	28	40.6
		PhD(general & specific)	26	37.7
5	Background of driving accident	yes	38	55.1
		no	31	44.9
6	Driving background	1-5 year	49	71
		5-10 year	20	29
7	Smoking	yes	13	18.8
		no	56	81.2

Table 2. investigating the relationship between emotional intelligence and its components with driving errors

variable	The total score of the questionnaire		Slip		Intentional violations		Mistakes		Non-deliberate violations	
	Correlation coefficient	*p*-value	Correlation coefficient	*p*-value	Correlation coefficient	*p*-value	Correlation coefficient	*p*-value	Correlation coefficient	*p*-value
Emotional Intelligence	-0.201	0.098	-0.152	0.213	0.109	0.195-	-0.220	0.07	-0.102	0.407
Happiness	-0.149	0.222	0.142	0.244	-0.087	0.476	-0.209	0.085	-0.099	0.416
Problem solving	-0.175	0.015*	-0.112	0.359	-0.174	0.015*	-0.224	0.065	-0.08	0.05*
Independence	-0.170	0.161	-0.170	0.163	-0.117	0.336	-0.123	0.315	-0.271	0.024*
Stress tolerance	-0.024	0.845	-0.019	0.879	-0.058	0.634	-0.060	0.622	-0.62	0.612
Self-flourishing	-0.225	0.064	-0.130	0.287	-0.247	0.041*	-0.248	0.04*	-0.153	0.209
Realism	-0.217	0.074	-0.146	0.230	-0.208	0.086	-0.221	0.068	-0.237	0.057*
Impulsivity Control	-0.36	0.768	-0.08	0.951	-0.133	0.275	0.081	0.508	0.07	0.568
Social Commitment	-0.249	0.039*	-0.173	0.155	-0.304	0.011*	-0.211	0.082	-0.042	0.734
Empathy	-0.122	0.318	-0.118	0.296	-0.115	0.347	-0.132	0.281	0.083	0.500
Self-awareness	-0.029	0.814	0.052	0.674	-0.059	0.631	-0.151	0.215	0.071	0.563
Interpersonal relationships	-0.106	0.387	-0.125	0.306	-0.044	0.720	-0.148	0.225	-0.046	0.707
Optimism	-0.112	0.360	-0.108	0.379	-0.052	0.672	-0.138	0.259	-0.179	0.140
Compatibility	-0.231	0.056	-0.182	0.135	-0.199	0.102	-0.230	0.057	-0.258	*0.033
Self-respect	-0.112	0.360	-0.108	0.379	-0.052	0.672	-0.138	0.259	-0.179	0.014*
Flexibility	-0.170	0.0161	-0.170	0.163	-0.117	0.336	-0.123	0.315	-0.271	0.024*
Dare	-0.115	0.345	-0.058	0.634	-0.136	0.266	-0.123	0.314	-0.079	0.519
Public mood	-0.142	0.244	-0.136	0.031*	-0.076	0.532	-0.190	0.119	-0.147	0.229
Stress control	-0.04	0.742	-0.982	0.02*	-0.136	0.266	0.042	0.732	0.085	0.489
Interpersonal skills	-0.0180	0.138	-0.135	0.176	0.169-	0.164	-0.190	0.119	-0.003	0.982
Intra-interpersonal proficiency	-0.175	0.152	-0.112	0.359	0.174-	0.152	-0.224	0.065	-0.08	0.516

P-value<0.05*

Table 3. Score of emotional intelligence and components of participants in the study

row	variable	average	Standard deviation	minimum	maximum
1	Emotional intelligence	329.62	36.18	238	411
2	Manchester general score	50.97	26.71	7	139
3	Intentional violations	18.56	11.32	1	50
4	Unintentional violations	3.44	2.41	0	10
5	Mistakes	7.91	5.64	0	28
6	Slippages	21.04	11.61	4	51

Pearson correlation coefficient was used to evaluate the relationship between emotional intelligence and driving errors with respect to normality of data. Based on table 2, the findings indicated that the total score of emotional intelligence had no relationship with driving errors and slips. A significant relationship was observed between components and sub-components of emotional intelligence with driving behavior components. According to this table, there was no significant relationship between sub-components of happiness and driving errors and offenses. Sub-component of problem solving had a significant relationship with driving behavior and then it was found out that there was no relationship between them. It also was observed that sub-component of independence had a significant and inverse relationship with unintentional offenses. There was no significant relationship between stress tolerance and driving errors. Self-actualization had a significant relationship with intentional offenses and errors. Sub-component of realism also had a negative significant relationship with unintentional offenses. Components of impulse control, empathy, self-awareness, interpersonal relationships, optimism, courage, public creation, stress control, interpersonal skill and intrapersonal skills were not linked with driving errors. But social commitment had a significant negative relationship with intentional offenses and the consistency, self-esteem and flexibility components had a significant negative relationship with unintentional offenses. With respect to table 3, the mean score of participants' emotional intelligence was 329.62 and the mean score of their driving behaviors was equal to 50/97. Also, most of participants were slipping while driving.

Discussion

Following the psychological structures for explaining aberrant driving behavior, the relationship between emotional intelligence and driving errors was studied. The results of this study declared that a significant inverse relationship could be observed between sub-components of problem-solving, independence, self-actualization, realism, social commitment, consistency, self-esteem, flexibility, general creation, stress control, and interpersonal skills with driving errors, which was in line with the research conducted by Abbaszade et al.[25] Also, the results of this study were consistent with the study carried out by Fallahi at.al (2015).[26] The result of the study by Dupriz et al. (2012) indicated that emotional intelligence influenced drivers' behaviors and was in line with the results of the present study.[27] So, people who had more ability and flexibility in problem solving had better social relationships and a happier temperament. They had fewer errors and mistakes and then had more acceptable driving. In related to these findings, uzeyir believed that individuals with higher emotional intelligence were generally optimistic, flexible, realistic, and successful in solving problems and coping with stress.[28] Individuals with low emotional intelligence were inclined to doing aberrant behaviors with aggressive and impulsive behaviors and were not able to evaluate and perceive the stressful events.

Consequently, they considered risk-taking or wrong behaviors and mistakes as solutions to deal with stress or avoid it and solutions to solve problems, and they were more likely involved in some errors while driving. In contrast, individuals with high emotional intelligence were capable of assessing their feelings and interpersonal social skills to solve problems.[29] Drivers with stress and anxiety were less focused and attentive. So, those who had better stress control were less likely to being involved in driving errors due to carelessness.[30] The answers and decisions made by anxious drivers led to an increase in the number of driving errors.[31] Individuals' moods might be useful in the problem-solving process with an impact on the organization and the use of information in memory.[32] Individuals with a positive and happy attitude to life and experiences would make better results for themselves and others and a more successful problem-solving process. They would also have better perception and expression of feelings by developing their emotional intelligence, they would create motivations in adaptive behaviors by adjusting feelings and temperatures of their own and others, and they would have more acceptable driving and less driving errors and slips by respecting social rights and observing driving laws. It seemed

that some elements of human personality led to different behaviors of individuals, and these behaviors might be different by a series of laws and regulations, and then wrong behavior, and one event or accident would have happened. So, persons who had the higher social commitment committed less driving errors.[32]

Conclusions

According to the results obtained from this study, it can be deduced that emotional intelligence and its components were effective in driving errors. This meant that individuals with lower levels of emotional intelligence would be more likely involved in driving error and slip. The constraint of this study was time-consuming process of questionnaire completion. Concerning the matter of the emotional intelligence in the human's behavior and performance and the fact that education was a cheap and accessible way to avoid driving errors and accidents, it is supposed to study more the issue of emotional intelligence and its training to drivers.

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