IJTE, Vol. 13, No. 3, Winter 2026, pp. 2307-2323
Research Paper

Effect of Myers-Briggs Personality Dimensions on High-Risk Driving Behaviors and Number of Accidents

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Received: 2024/11/12 *Accepted: 2025/09/02*

Abstract

Traffic accidents and physical and financial casualties are a serious and global problem. The human, the road, the vehicle, and the environment are the four causes of traffic accidents, and among them, the most effective factor is the human factor. Therefore, in the field of traffic safety, social science studies, in particular, psychology and driver studies, are necessary. The main purpose of this study was to investigate the relationship between personality dimensions of Myers-Briggs personality test on high-risk driving behaviors and the number of accidents. The population of the study consisted of all Razi University students who hold a driving license. Using the Cochran formula, 361 samples were obtained and selected by the available sampling method. The research tool is a questionnaire consisting of three sections: demographic questions, a researcher-made questionnaire on high-risk driving behaviors, and a Myers-Briggs personality test. Confirmatory factor analysis and structural equations were used to confirm the research hypotheses and questions. Amos software was used for data analysis. Increasing Personality Preferences (Extrovert, Intuitive, Perceiver) Increases Risk Driving Behaviors, and with increasing personality preferences (Introvert, Sensor, and Judger) the number of risky driving behaviors decreases. According to the results people with personality preferences (extrovert, intuitive, and Perceiver) have the highest number of high-risk driving behaviors and the number of crashes As well as people with personality preferences (Introvert, Sensor, and Judger), they have the least number of high-risk driving behaviors and the least number of crashes.

Keywords: Myers-Briggs Test, Accidents, High Risk Driving Behaviors, Structural Equations, Multivariate Regression

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1. Introduction

Research shows that the human factor is the most effective factor in road accidents. Given the importance of the human factor, it is necessary to use social science studies to find the relationship between the human factor and risky driving. The traits a person has to affect his behavior and Taken together, these traits form the personality of the individual [Jonah, 1997]. Numerous studies have shown that people with a high number of car accidents differ in some personality traits compared to people with a low number of car accidents [Burgess, 2002]. According to research by Neuman and his colleagues, more than 90 percent of drivers' accidents are caused by personality, and behavior [Neuman et al. 2003]. Driving behavior is the behavior that the driver chooses as a model for their driving, and it can be different for each driver. For example, a driver is always used to wearing a seat belt [Ozkan and Lajunen, 2005].

Personality tests are used to identify a person's personality. The phrase "human while driving is like his personal life" indicates the impact of personality on driving. Furthermore, considerable research has been done on driver personality as an essential variable in driving [Jonah, BA, Thiessen, E., Au-Yeung, E, 2001]. Lucidi et al. (2019) conducted a study to investigate personality traits and attitudes toward traffic safety in predicting risky behavior among young, adult and older drivers. The effects of personality traits on high-risk driving behaviors Anxiety, altruism, neglect disorder predicted only in young and adult drivers. Whereas the emotion variable was only in the young drivers and the anxiety variable was a positive predictor of the driving errors in the two groups of adults and young[Lucidi et al., 2019]. Mamcarz et al. (2019) conducted a study entitled "Level of occupational stress, personality and traffic incidents: Comparative study of public and freight transport drivers." The sample is 150 drivers selected from two transport companies from Lubin. Statistical analysis was performed using SPSS software, based on the relationship between personality traits and job stress level. The results showed that there was a statistically significant difference between the groups and And there is a positive correlation between personality traits and job stress[Mamcarz et al., 2019]. Endriulaitiene et al. (2018) conducted a study to investigate the relationship between dark triad personality traits (Machiavellianism, narcissism, and psychotherapy) and risk attitude in a group of driver's license volunteers. The sample included 475 drivers (187 males and 288 females) who completed the dark triad questionnaire and high-risk driving behaviors. The results showed that for both groups, dark personality was significantly associated with high risk driving attitudes [Endriulaitiene et al., 2018]. Alavi et al. (2017) conducted a study to evaluate variables such as personality characteristics, driving behavior, and mental illness in two groups of drivers with and without a car accident. Results showed that there was a significant difference between the two groups. , As well as anxiety and depression can increase the odds ratio of road accidents to 2.4 to 2.7. Furthermore, neuroticism alone can increase the likelihood of road accidents to 1.1 [Alavi et al., 2017]. Lucidi et al. (2014) conducted a study aimed at investigating the influence of personality and attitude as a predictor of dangerous driving in older drivers. Structural equation modeling showed that personality traits predict risky driving [Lucidi et al., 2014]. Rafahi et al. (2012) conducted a study to investigate the psychosocial factors predicting traffic accidents in Shiraz. Data analysis showed that the predictive role of attitude toward driving is stronger than other variables. The results also showed that there was a negative correlation between the personality characteristics of neuroticism and driving behavior [Rafahi et al., 2012]. In their research, Dehlan (2006) concluded that different combinations of prediction are needed to

describe different aspects of driving behavior. In the study of Ullberg and Rundmo (2003), the results of structural equation modeling showed the relationship between personality traits and driving behavior with mediating attitudes. Dobson et al. (1999) concluded that undesirable personality traits could lead to evasion law as well as to dangerous driving and to accidents [Dobson et al., 1999]. Jonah (1997) conducted a study to investigate the impact of emotion on driving behavior and concluded that there was a significant and direct relationship between emotion and high-risk driving behavior[Jonah, 1997].

In a study aimed that checking which of the selected personality and temperament traits allow to predict the tendencies of car drivers to consciously take risk on the road. Therefore, the initially studied group of 306 car drivers measured by the *Road Traffic Behaviours Questionnaire* KZD-P. Selected personality and temperament traits were assessed using the *Personality Inventory* NEO-FFI.based on the results, Conscientiousness and Empathy turned out to be negatively associated solely with conscious risking on the road, while Impulsiveness was an important factor for risky driving regardless of risk perception. Additionally, age and driving experience were significant predictors of risk-taking only among the drivers who were aware of the risks on the road. Based on the results, it seems that risk perception should be taken into account when searching for determinants of risk-taking in road traffic [Baran et al. 2021].

another study presents a comprehensive systematic review of worldwide research on the relationship between personality and safety behaviors in context of road and traffic safety to identify key areas. The researchers using bibliometric and visual analysis methods, examine a sample of 613 studies extracted from the Scopus database based on a search query string with rigorous inclusion and exclusion criteria. The results indicate that the research field is yet to be fully developed and more research is warranted towards wider personality traits and subtypes, using different structures of personality, employing longitudinal designs and behavioral methods, and expending insights from personality research for accident prevention and to develop and predict directives for self-driving vehicles[Faílde-Garrido et al. 2023].

A study investigates the influence of personality traits such as anxiety, sensation seeking, altruism, anger, and normlessness on young powered two-wheeler riders' risky riding behavior. The theory of planned behavior (TPB) is extended to include personality traits forming an extended TPB (ETPB). The ETPB model is used to examine how personality traits directly influence risky riding behavior and indirectly influence risky riding behavior through latent mediating factors. The study sample included 535 high school students in Phu Yen, Vietnam. The results showed that personality traits, directly and indirectly, influence risky riding behaviors through the mediating construct. Young riders with sensation-seeking, anger, and normlessness have a higher frequency of risky riding behavior than those with anxiety and altruistic personality traits. Sensation seeking, anger, and normlessness indirectly influence risky riding behavior through risk perception and subjective norms. In addition, the results also show a clear difference in the relationship between the personality and behavior of people who have been involved in traffic accidents and those who have never been involved in accidents[Le et al. 2023].

Although a large number of studies have examined the relationship between the Big Five personality traits and driving behaviors, consistent evidence for their relationships is still lacking. The main purpose of a study was to systematically review the relationships between the Big Five personality traits and various driving behaviors through a meta-analysis. A total of 34 articles met the inclusion criteria for the meta-analysis. The results showed that the

association between the Big Five personality traits and driving behaviors could be moderated by age, gender and type of personality measure. In conclusion, this study contributes to the literature by quantitatively synthesizing existing findings and reconciling previous debates on the relationship between the Big Five personality traits and driving behaviors [luo et al. 2023].

another study aims to examine the influence of personality traits (alternative Zuckerman model) and driving anger in the explanation of risky driving style in individuals convicted for road safety offences, using as a basis an adaptation of the context-mediated model [Pereira et al. 2022] .

The new scale employs perceived safety priority as the metric of safety climate and a multilevel framework, separating the measurement of organization- and group-level safety climate. The second purpose of this study was to compare the predictive power of generic items with trucking industry-specific ones. Three dimensions for each of the two levels of safety climate were drawn from the results [Roach et al. 2016].

In the research that is cited as background, as well as in other studies of traffic psychology, each of the theories focuses on a particular topic and studies a part of the driver's tasks. As such, there are many specialized models for identifying traffic behavior, and the reason is the complexity of human behavior and personality. None of the aspects of human behavior can be applied to a simple mathematical equation that has an accurate prediction since a multitude of factors influences human behavior. As a result, the prediction of driver behavior from a theoretical model can be affected by sudden, unpredictable changes and different conditions. However, it is necessary to apply driver theories and models. None of the articles used Myers-Briggs personality tests to find the relationship between personality preferences (introvert and extrovert, intuitive, Sensor, Thinker, Feeler, judger, and perceiver) with high-risk driving behaviors and accident rates.

The primary purpose of this study is to find the relationship between personality preferences, high-risk driving behaviors, and some traffic accidents. For this reason, specific goals are considered to determine the impact of personality preferences on the number of accidents mediated by high-risk driving behaviors and to determine the personality preferences of the most dangerous and least dangerous drivers.

2. Methodology

The statistical population of this study consisted of all University students who hold a driving license. The statistical samples required for this study were selected by available random sampling. According to the Cochran formula, 361 samples were obtained. The research tool in this research is a questionnaire consisting of three parts. The first section asked demographic questions including information such as age, gender, education, as well as questions about the subject under consideration, such as the number of accidents in the past two years. The second part of a researcher-made questionnaire consisted of 38 items, named after high-risk driving behaviors. The third part is the Myers-Briggs questionnaire to identify individuals' personalities. The questionnaire of high-risk driving behaviors was prepared by examining the most effective human high-risk behaviors affecting traffic accidents. The questionnaire contains 38 terms and four subscales. The subscales include aggressive behavior (road rage), distraction and fatigue, disagreement, and disregard for their health. Cronbach's alpha coefficients for Risk Behaviors Questionnaire for subscales, aggressive behavior, distraction and fatigue, disagreement, disregard for their health and the whole questionnaire were 0.87, 0.78, 0.75, 0.83 and 0.85, respectively. That was statistically significant (above 0.7). The significance of

these coefficients means that the Risk Behaviors Questionnaire has excellent reliability.

Myers-Briggs questionnaire was used to find personality dimensions. Four personality traits are identified for each individual through the Myers-Briggs questionnaire. Each of these features represents one of the individual's personality dimensions. In the Myers-Briggs questionnaire, there are two poles for each of the four dimensions of personality, and each person is closer to one of these two poles.

Extrovert-Introvert: This dimension is more about the energy of individuals than anything else.

Sensor - intuitive: The second dimension of personality type depends on what kind of information we usually find out.

Thinker- Feeler: The third dimension of personality type is related to our decisions and conclusions. There are two ways to make decisions: one is logical, and the other is emotional.

Perceiver –judger: The fourth dimension of personality type depends on whether we want to live a more regular life or prefer independence.

Despite the shortcomings of the Myers-Briggs personality test, this test also has some advantages. Among the advantages of this test are its simplicity and availability, and it does not require specific research ethics permits to conduct this test. On the other hand, this test adequately assesses some characteristics of individuals, which describe the typical behavior of individuals. Finally, the Myers-Briggs test has been adequately studied in different countries, including Iran, and its results are in good agreement with reality.

In this study, the validity and reliability of the researcher-made questionnaire on risky driving behaviors were examined using exploratory factor analysis, calculating Cronbach's alpha coefficients, and calculating the correlation of subscales with the total test score. Then, multivariate regression was used to measure the predictive power of the number of accidents. Finally, confirmatory factor analysis and structural equations were used to confirm the hypotheses and research questions. Amos and SPSS software were used to analyze the data.

In confirmatory factor analysis, the researcher seeks to develop a model that is assumed to describe or explain the experimental data based on a relatively small number of parameters. This model is based on pre-experimental information about the structure of the data, which can be in the form of a theory or hypothesis, a specific classification scheme for items in accordance with objective characteristics of form and content, known experimental conditions, or knowledge from previous studies on large data. Confirmatory methods (hypothesis testing) determine whether the data are consistent with a given factor structure (as stated in the hypothesis) or not.

Structural equation modeling is a data analysis technique designed to assess the relationship between two types of variables: a) Explicit variables, which are directly measured, and observed variables. b) Latent or hidden variables, which are variables that are proposed as theoretical constructs. A very valuable feature of structural equations is the simultaneous analysis and processing of relationships between variables in the measurement model. Structural equation modeling allows the researcher to analyze the causality of latent and observed variables simultaneously.

Structural equation modeling is a statistical method that takes a confirmatory approach to structural theories of phenomena (i.e., testing hypotheses). These structural theories usually show causal processes.

Researchers in many scientific studies deal with a large number of variables and concepts, and the problem that these studies face is that the large number of variables and concepts causes confusion in the research and makes it difficult to draw conclusions. The goal of exploratory factor analysis can be stated as reducing the

number or categories of variables under study. In conducting exploratory factor analysis, the set of main variables is converted into one or more smaller sets.

Confirmatory factor analysis and structural equations were used to confirm the research hypotheses and questions. Amos software was used for data analysis.

3. Results and Discussion

The first part of the questionnaire is about demographic information. In this section, gender, marital status, educational status, and the number of accidents in the past two years have been questione.

Table 1. Frequency distribution of study units according to individual characteristics

Variables		Abundance	percent
Gender	Female	48	13.7
	male	302	86.3
Marital status	Single	301	86
	Married	49	14
Educational status	Undergraduate	189	54
	Masters	134	38.3
	PhD	27	7.7
number of accidents	I have not been in an accident	241	68.9
	Once or twice	102	29.1
	Three or four times	2	0.6
	Five times or more	5	1.4

According to Table 1, about 14 % of respondents are women, and 86 % of the respondents are men. According to Iranian culture, female drivers are less than male drivers. Most of the population is single people.

In this section, models of the relationship between personality preference variables on the number of accidents with the mediating variable of risky behaviors are presented. In these models, each of the personality preferences is used separately. The mediating variable is risky driving behaviors. The primary dependent variable is the number of accidents.

In structural equation models, all variables include observed and not observed variables. The observed variables (rectangles) are directly measured by the researcher, while unobserved (elliptic) variables are not directly measured; they are deduced from relationships or correlations between observed variables. In this study, high-risk behaviors are unobserved, and personality preferences and the number of accidents are the observed variables.

In structural equation models, the most important statistic is the chi-square statistic. However, the chi-square statistic is very sensitive to sample size. Thus, the chi-square value is divided by the degree of freedom, and if the value is less than three, it is appropriate. The RMSEA index for models with a good fit is less than 0.8. The CFI, GFI, and AGFI indices are between 0 and 1. The higher these indices, the better the model.

Table 2. The standard value of model fit indices

INDEX	χ^2/df	GFI	CFI	AGFI	RMSEA
ACCEPTABLE VALUES	1-5	>۰/۹	>۰/۹	>0.8	<0.08

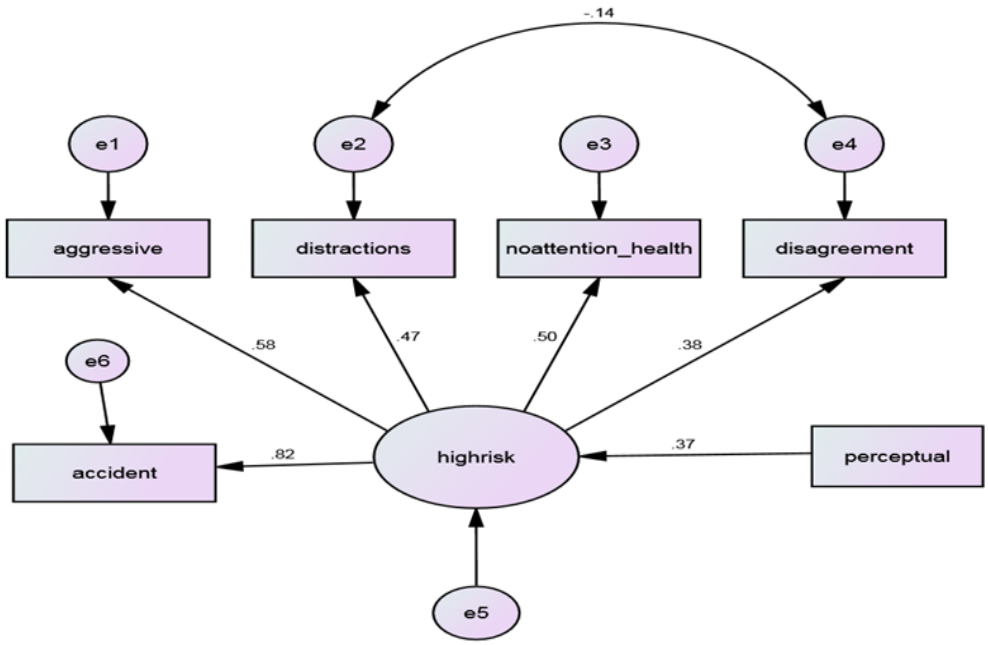

Figure 1. The Relationship between perceiver Variable and Number of Accidents with the Mediator of High-Risk Behaviors

In Figure 1, the perceiver variable is the independent variable, and the number of accidents is used as the primary dependent variable. As well as variable risky driving behaviors have been used as intermediary variables, which include subscales of aggressive behavior, distraction, and fatigue, disagreement, and disregard for personal health.

Table 3. Indicators of overall model evaluation of the relationship of perceiver variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	19.28
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.013
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	2.411
GOODNESS OF FIT INDEX (GFI)	0.983
COMPARATIVE FIT INDEX (CFI)	0.963
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.955
(RMSEA)	0.06

The results of Table 3 show that the chi-square value is 19.28, and the degree of freedom is eight, and the chi-square ratio to the degree of freedom is 2.411. The RMSEA index value is 0.06 and has a good fit. GFI, CFI, and AGFI indices have values of 0.983, 0.963, and 0.955, respectively. All indices indicate the suitability of the structural equation model.

Table 4. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇦ perceiver	0.025	5.53	***	0.37	**Confirmed**
Accident ⇦ High-risk	0.132	8.76	***	0.82	**Confirmed**

All paths with an impact factor greater than 0.3 are confirmed. According to the results of Table 4, it can be seen that the impact factor of the perceiver variable to driving behavior is 0.37. This path has an impact factor greater than 0.3 and is confirmed, which indicates a direct relationship between the perceiver variable and the driving behavior variable. As a result, risky driving behaviors increase as drivers' perceptions increase.

According to Figure 1, perceiver attributes have the most significant impact on aggressive behavior and disregard for individual health (no attention-health).

The driving behavior with the number of accidents has a decisive impact factor of 0.82. As a result, the number of accidents increases with the increase in risky driving behaviors. Perceptual characteristics have the most influence on aggressive behavior and disregard for individual health. As more perceptive individuals make decisions based on their minds, they tend to pay less attention to their own health and that of others. These people are wandering, and as a result, high-risk behaviors of this kind are also seen as a major leak.

In Figure 2., the intuitive variable is the independent variable, and the number of accidents is used as the primary dependent variable. As well as variable risky driving behaviors have been used as intermediary variables.

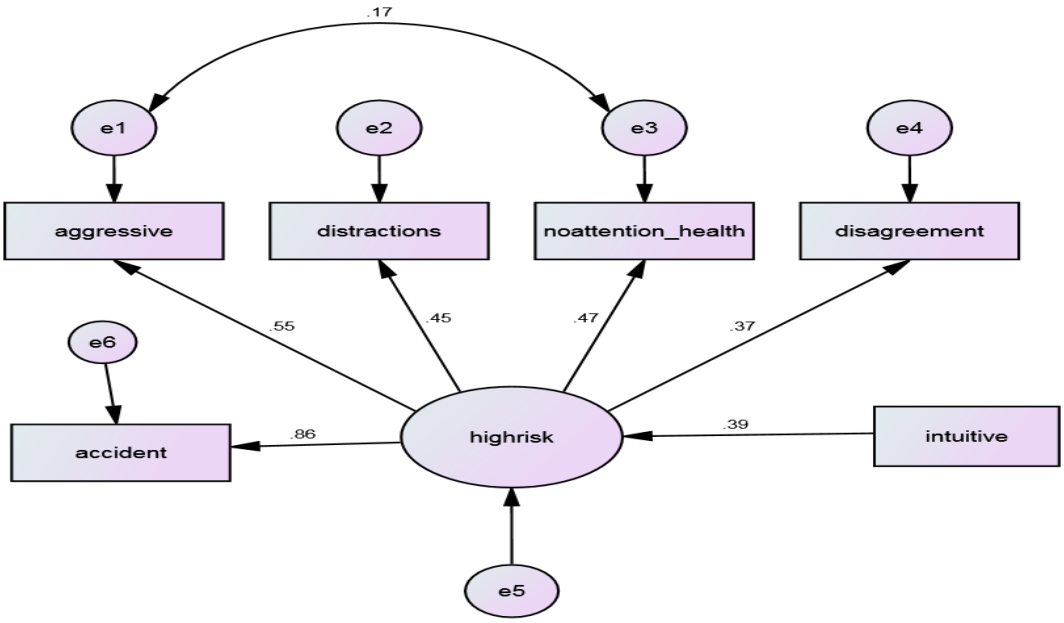

Figure 2. The Relationship between Intuitive Variable and Number of Accidents with the Mediator of High-Risk Behaviors

Table 5. Indicators of overall model evaluation of the relationship of Intuitive variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	15.16
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.056
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	1.896
GOODNESS OF FIT INDEX (GFI)	0.985
COMPARATIVE FIT INDEX (CFI)	0.977
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.962
(RMSEA)	0.05

The results of Table 5 show that the chi-square ratio to the degree of freedom is 1.896. The RMSEA index value is 0.05 and has a good fit. GFI, CFI, and AGFI indices have values of 0.985, 0.977, and 0.962, respectively. All indices indicate the suitability of the structural equation model.

Table 6. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇦ Intuitive	0.03	5.57	***	0.39	**Confirmed**
Accident ⇦ High-risk	0.16	7.67	***	0.86	**Confirmed**

According to the results of Table 6, it can be seen that the impact factor of the Intuitive variable to driving behavior is 0.39. This path has an impact factor greater than 0.3 and is confirmed, which indicates a direct relationship between the Intuitive variable and the driving behavior variable. As a result, risky driving behaviors increase as drivers' Intuitive increases. The path of driving behavior with the number of accidents has a decisive impact factor of 0.86. As a result, the number of accidents increases with the increase in risky driving behaviors. Intuitive attributes have the most significant impact on aggressive behavior and disregard for individual health.

Intuitive traits, meanwhile, have the greatest impact on aggressive behavior and disregard for individual health. Because intuitive people will not believe it until they experience pain and accident, they will pay less attention to their own health and that of others. As a result, high-risk behaviors of this gender are seen. These people are wacky, and as a result, high-risk behaviors of this kind are also common.

Based on the results of this section and the previous section, it can be said that both intuitive and perceptual characteristics of drivers positively influence and enhance drivers' high-risk behaviors. In other words, people perceive or intuitively exhibit more or less the same driving behavior. This part of the personality is a factor in increasing risk and consequently increasing the number of accidents.

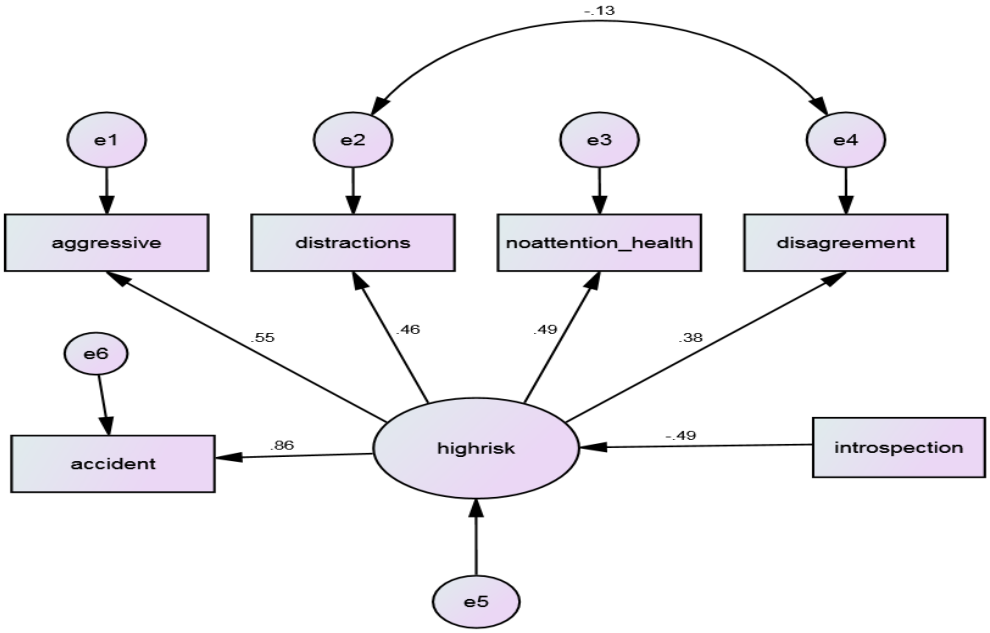

Figure 3. The Relationship between Introvert Variable and Number of Accidents with the Mediator of High-Risk Behaviors

In Figure 3, the Introvert variable is the independent variable, and the number of accidents is used as the primary dependent variable. As well as variable risky driving behaviors have been used as intermediary variables.

Table 7. Indicators of overall model evaluation of the relationship of Introvert variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	18.74
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.016
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	2.34
GOODNESS OF FIT INDEX (GFI)	0.983
COMPARATIVE FIT INDEX (CFI)	0.969
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.955
(RMSEA)	0.06

The results of Table 7 show that the chi-square ratio to the degree of freedom is 2.34. The RMSEA index value is 0.06 and has a good fit. GFI, CFI, and AGFI indices have values of 0.983, 0.969, and 0.955, respectively. All indices indicate the suitability of the structural equation model.

Table 8. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇦ Introvert	0.03	-6.91	***	-0.49	**Confirmed**
Accident ⇦ High-risk	0.14	7.78	***	0.86	**Confirmed**

According to the results of Table 8, it can be seen that the impact factor of the Introvert variable to driving behavior is -0.49, Negative impact factor indicates that introversion has an inverse relationship with high-risk driving behaviors. The coefficient of influence of driving behavior with the number of accidents has a positive value of 0.86. As a result, the number of accidents increases with the increase in risky driving behaviors.

Introverted people are usually more cautious about their surroundings and therefore have less risky behaviors. On the other hand, introverts are not interested in being seen in public environments and therefore do not engage in activities that attract the attention of others and as a result are not exposed to high-risk behaviors.

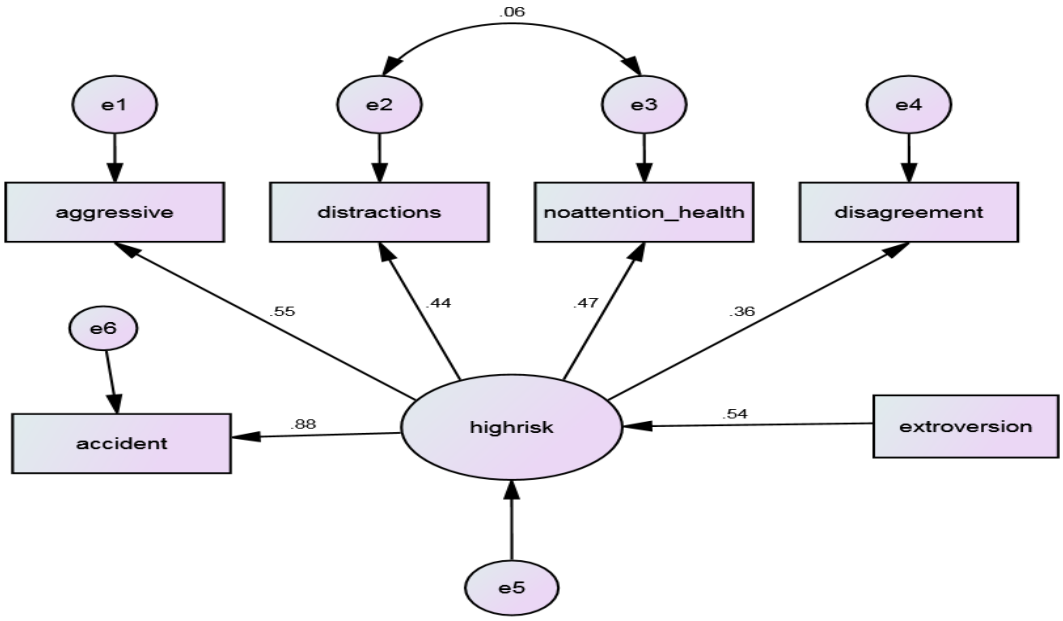

Figure 4. The Relationship between Extrovert Variable and Number of Accidents with the Mediator of High-Risk Behaviors

In Figure 4, the Extrovert variable is the independent variable, and the number of accidents is used as the primary dependent variable. As well as variable risky driving behaviors have been used as intermediary variables.

Table 9. Indicators of overall model evaluation of the relationship of Extrovert variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	23.68
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.003
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	2.96
GOODNESS OF FIT INDEX (GFI)	0.978
COMPARATIVE FIT INDEX (CFI)	0.957
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.942
(RMSEA)	0.07

The results of Table 9 show that the chi-square ratio to the degree of freedom is 2. 96. The RMSEA index value is 0.07 and has a good fit. GFI, CFI, and AGFI indices have values of 0.978, 0.957, and 0.942, respectively. All indices indicate the suitability of the structural equation model.

Table 10. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇦ Extrovert	0.029	7.287	***	0.54	**Confirmed**
Accident ⇦ High-risk	0.149	7.788	***	0.88	**Confirmed**

According to the results of Table 10, it can be seen that the impact factor of the extrovert variable to driving behavior is 0.54. This path has an impact factor greater than 0.3 and is

confirmed, which indicates a direct relationship between the extrovert variable and the driving behavior variable. As a result, risky driving behaviors increase as drivers' Extrovert increases. The path of driving behavior with the number of accidents has a decisive impact factor of 0.88. As a result, the number of accidents increases with the increase in risky driving behaviors. Extroverts are usually interested in being seen in public environments and as a result engage in activities that attract the attention of others and result have high risk behaviors.

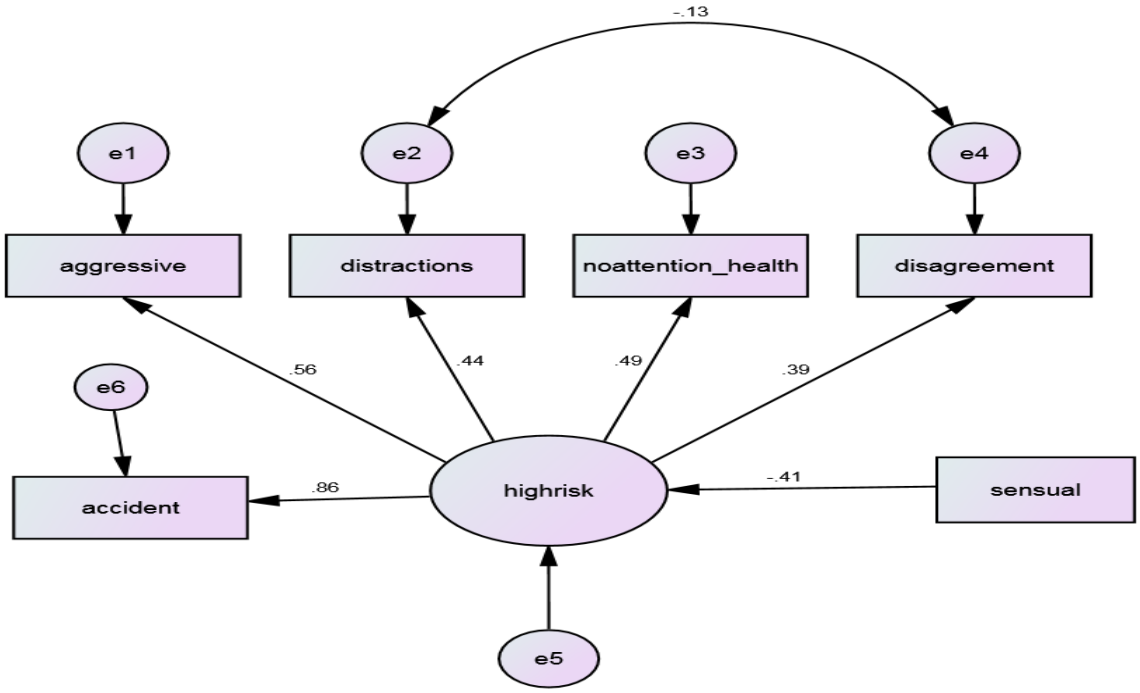

Figure 5. The Relationship between Sensor Variable and Number of Accidents with the Mediator of High-Risk Behaviors

In Figure 5, the Sensor variable is the independent variable, and the number of accidents is used as the primary dependent variable as well as variable risky driving behaviors have been used as intermediary variables.

Table 11. Indicators of overall model evaluation of the relationship of Sensor variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	20.35
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.009
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	2.544
GOODNESS OF FIT INDEX (GFI)	0.982
COMPARATIVE FIT INDEX (CFI)	0.961
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.953
(RMSEA)	0.06

The results of Table 11 show that All indices indicate the suitability of the structural equation model.

Table 12. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇦ Sensor	0.020	-6.051	***	-0.41	**Confirmed**
Accident ⇦ High-risk	0.143	8.697	***	0.86	**Confirmed**

According to the results of Table 12, it can be seen that the impact factor of the Sensor variable to driving behavior is -0.41. The negative impact factor indicates that the Sensor variable has an inverse relationship with high-risk driving behaviors. The coefficient of influence of driving behavior with the number of accidents has a positive value of 0.86. As a result, the number of accidents increases with the increase in risky driving behaviors. Sensitive people understand the risks more quickly and are not willing to risk behaviors while driving. These people exhibit low risk behaviors.

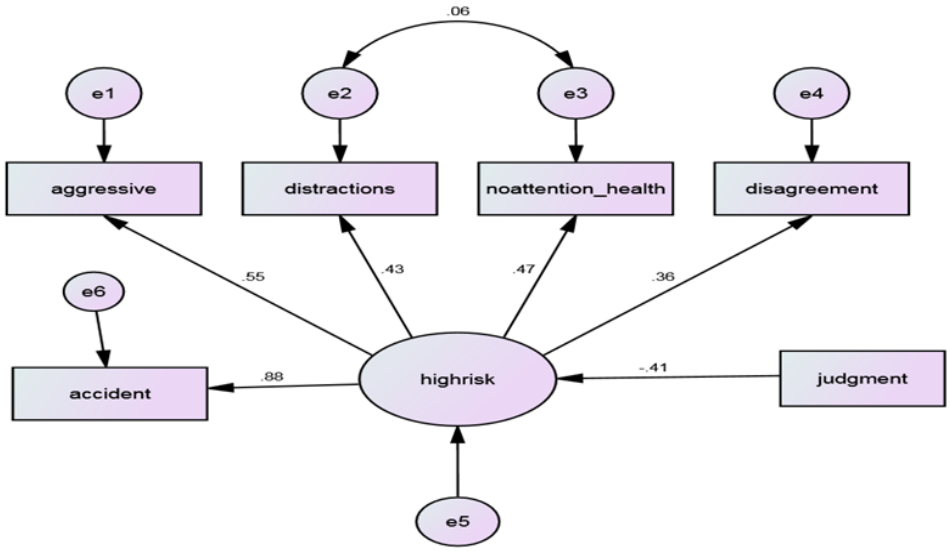

Figure 6. The Relationship between Judger Variable and Number of Accidents with the Mediator of High-Risk Behaviors

In Figure 6, the Judger variable is the independent variable, and the number of accidents is used as the primary dependent variable. As well as variable risky driving behaviors have been used as intermediary variables.

Table 13. Indicators of overall model evaluation of the relationship of Judger variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	22.92
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.003
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	2.865
GOODNESS OF FIT INDEX (GFI)	0.979
COMPARATIVE FIT INDEX (CFI)	0.953
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.944
(RMSEA)	0.07

The results of Table 13 show that All indices indicate the suitability of the structural equation model.

Table 14. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇐ Judger	0.027	-5.908	***	-0.41	**Confirmed**
Accident ⇐ High-risk	1.302	8.303	***	0.88	**Confirmed**

According to the results of Table 13, it can be seen that the impact factor of the Judger variable on driving behavior is -0.41. The negative impact factor indicates that the Sensor variable has an inverse relationship with high-risk driving behaviors. The coefficient of influence of driving behavior with the number of accidents has a positive value of 0.88. As a result, the number of accidents increases with the increase in risky driving behaviors. Judging can analyze existing situations and thus avoid risky behaviors when properly analyzed. As a result, this personality trait reduces risky driving behaviors.

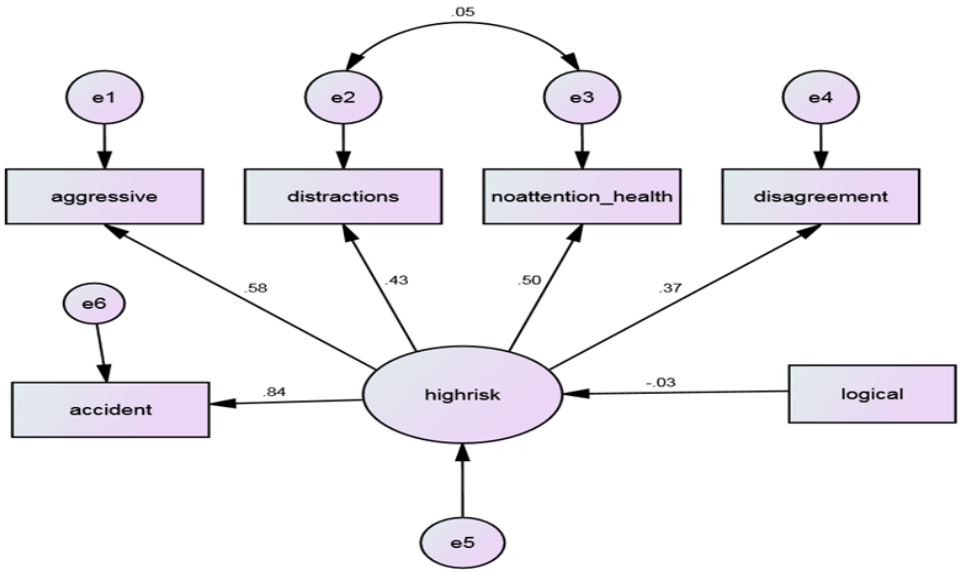

Figure 7. The Relationship between thinker Variable and Number of Accidents with the Mediator of High-Risk Behaviors

In Figure 7, the thinker variable is the independent variable, and the number of accidents is used as the primary dependent variable. As well as variable risky driving behaviors have been used as intermediary variables.

Table 15. Indicators of overall model evaluation of the relationship of thinker variable with the number of accidents with the intermediary variable of risky behaviors

FIT INDICES	THE OBSERVED VALUES
CHI-SQUARE (χ^2)	21.045
DEGREES OF FREEDOM (DF)	8
THE SIGNIFICANCE LEVEL (P)	0.007
CHI-SQUARE TO FREEDOM RATIO (χ^2/df)	2.631
GOODNESS OF FIT INDEX (GFI)	0.980
COMPARATIVE FIT INDEX (CFI)	0.951

FIT INDICES	THE OBSERVED VALUES
ADJUSTED GOODNESS OF FIT INDEX (AGFI)	0.949
(RMSEA)	0.07

The results of Table 15 show that All indices indicate the suitability of the structural equation model.

Table 16. Standardized impact coefficients

Route	The standard error (S.E)	Critical Ratio (C.R)	The significance level (P)	Standardized Estimate	Result
High-risk ⇦ thinker	0.009	-0.488	0.626	-0.03	**Not confirmed**
Accident ⇦ High-risk	0.150	7.906	***	0.84	**Confirmed**

Table 16 shows the standard impact coefficients. The logical variable path to high-risk behaviors was not confirmed because of an impact factor of less than 0.3.

In all models, high-risk driving behaviors are actively and directly related to the number of accidents. The coefficients of the impact of high-risk driving behaviors in models of Perceiver, intuitive, Introvert, Extrovert, Sensor, Judger, and Thinker with the number of crashes were found between 0.82 and 0.88. The positive coefficients of these coefficients mean their direct relationship, and being close to one means that the coefficients are stronger. Furthermore, in all models, out of the four dangerous driving behaviors, aggressive behavior has the most influence on high-risk behaviors.

4. Conclusion

One of the most important causes of traffic accidents is the human factor. Human behavior while driving is significantly influenced by their personality traits. Humans display behaviors while driving that can increase the likelihood of an accident. In this study, high risk behaviors while driving are divided into four categories: aggressive behavior, distraction and fatigue, disregard for their health and disagreement. A researcher-made questionnaire and Myers-Briggs personality questionnaire were used to investigate the impact of personality traits on high-risk behaviors and accidents. Structural equations were used to analyze the results. In these models, personality traits are considered as independent variables, risky behaviors as intermediate dependent variable and number of accidents as dependent variable. It should be noted that this research has been conducted on a specific youth population and may not be generalizable to the whole community. The present study is a pilot study and was conducted to describe the driving behavior of educated youth. This is one of the limitations of the study. Based on the obtained results and analyzes, the relationship between personality traits and high-risk behaviors as well as the relationship between high-risk behaviors and the number of accidents is as follows.

1. Perceptual-intuitive attributes have a positive effect on high-risk driving behaviors. In other words, these personality dimensions increase the risk of high risk behaviors in drivers. This aspect of the personality of the individual causes them to be inattentive.
2. Introversion - Extraversion in individuals affects high-risk behaviors. According to the results of the study, introversion specificity in individuals reduces risky behaviors and extroversion specificity increases tendency to these behaviors. Introverted people are less likely to be seen and therefore do not exhibit behavior that requires much attention. Extroverts, on the contrary, are more aggressive.
3. The sensitve-judging aspect of a person's personality reduces risky driving behaviors. This aspect of the personality, if it is more

sensitive, increases the speed of detection and reaction, and if it is judging, it prevents risky behaviors. Both aspects reduce the number of accidents.

4. According to the results, people with personality preferences (extroverted, intuitive, and perceptual) have the highest number of high-risk driving behaviors and number of accidents, as well as those with personality preferences (judgmental, introverted, and intuitive). They have the highest number of dangerous driving behaviors and the least number of accidents.

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