

Full Length Article

Open Access

Code: 4784

Re-conceptualizing Risky Driving Behaviors: Evidences from Jimma Town and Kersa DistrictKinde Getachew^{1*}, Nega Jibat², Getachew Tilahun³, Dejene Gemechu⁴

Citation: Kinde Getachew, Nega Jibat, Getachew Tilahun, Dejene Gemechu. (2024). Re-conceptualizing risky driving behaviors: Evidences from Jimma town and Kersa district. *Ethiop.j.soc.lang.stud.* Vol. 11 .No.1, pp.131-147.

eISSN: 2408-9532; pISSN: 2412-5180. Web link: <http://journals.ju.edu.et/index.php/ejssls>

Publication history. Accepted in a revised form: 20 Jun, 2024

Subscription(electronics): Submission fee: Free of payment ; Accessing fee: Free of payment

Copyright: © 2024 Jimma University. A first publication right is granted to the journal. Jimma University makes the publications to be made available freely (open access).

License: Published by Jimma University. This is an open access article under the CCBY-NC-ND license (<http://creativecommons.org/licenses/BY-NC-ND/4.0/>).

Abstract

The conceptual distinctions of risky driving behaviors as lapses, errors, and violations are essential. However, recent research still tends to view these behaviors as a single construct. The objective of this research is, therefore, to split risky driving behavior into its component parts and show the relationship of the psychosocial factors to drivers' errors, lapses, and violations during driving. One hundred eighty-one drivers were selected using a cluster sampling technique from four high-incident areas in Jimma Town and three areas in Kersa. They completed the Driver Behavior Questionnaire (DBQ). A hierarchical multiple linear regression analysis was used to analyze the data. The analysis revealed hostile personality (hp) significantly predicted lapses, $R^2=16.9\%$, $b_{hp}=.297$, $t=5.98$, $p=.001$; errors, $R^2=21.7\%$, $b_{hp}=.372$, $t=7.08$, $p=.001$; hostile personality, and substance use (su) together predicted violations, $R^2=16.1\%$, $b_{hp}=.246$, $t_{hp}=4.5$, $p_{hp}=.001$; and, $b_{su}=.345$, $t_{su}=3.56$, $p_{su}=.001$. Hence, the study concluded the conceptual distinction of risky driving behavior as lapses, errors, and a violation is partially justifiable, though several research works are needed. The study implies researchers should be more specific in their investigations and reporting to inform the development of targeted strategies for reducing road traffic accident.

Key words: Errors, Lapses, Risk driving behavior, Violations

* Corresponding author: the details about the authors are given at the end of the manuscript.

1. Introduction

Road traffic accidents (RTAs) are becoming a significant threat worldwide, resulting in injuries that often lead to disabilities and even loss of life, accompanied by substantial economic and social consequences (Yan, Chen, Wang, Zhang, & Zhao, 2021). According to the World Health Organization's WHO (2022) report, approximately 1.3 million lives are lost annually due to road traffic crashes, and between 20 and 50 million more people suffer non-fatal injuries, many of which result in disabilities. Furthermore, the report highlights that road traffic injuries impose significant economic burdens on individuals, their families, and nations as a whole, accounting for 3% of their gross domestic product.

Ethiopia is not an exception to the global trend of road traffic accidents (RTAs). According to a report by Fana Broad Casting (FBC) (2021), citing the Federal Police Commission Data, a total of 20,672 road traffic accidents occur between July and December 2020, resulting in 1,848 fatalities and 5,211 injuries (2,646 serious, 2,565 minor) across all Regional States and the two City Administrations, except Tigray. However, other reports suggest that the actual fatality figures may be much larger than those reported by the Ethiopian Federal Police Commission due to issues related to underreporting and misclassification of road traffic fatalities. For instance, the World Health Organization (WHO) report indicates that the estimated number of road fatalities in Ethiopia was 27,326 in 2016, more than six times the figure reported by the country (UNEC, 2020).

Drivers' behavior, vehicles' technical problems, and environmental conditions actively interact to cause RTAs (Novikov, Shevtsova, & Vasilieva, 2020). However, research results and reports from relevant offices elucidate that drivers' behavior, otherwise called psychosocial factors, play a significant role in causing RTAs (Kongcharoen, Onmek, Karrila, & Seksan, 2022; Peltzer & Renner, 2004). Data from the Ministry of Transport, Ethiopia cited in UNEC(2020) reveals that human factor is the most frequently cited contributing factor for crashes, followed by environmental (5.4%) and vehicle factors (0.5%).

Risky driving behavior is often classified into three categories: violations, errors, and lapses (Parker, West, Stradling, & Manstead, 1995; Reason, Manstead, Stradling, Baxter, & Campbell, 1990). Lapses are absent-minded behaviors with consequences mainly for the perpetrator, posing no direct threat to other road users. Errors are typically misjudgments and failures of observation that may be hazardous to others, such as failing to check one's rear-view mirror before pulling out or changing lanes, and missing traffic signs. Violations involve deliberate contraventions of safe driving practices, which include disregarding speed limits, unnecessary honking, running red lights, and chasing another driver when angered (Nayum, 2008; Parker et al., 1995; Reason et al., 1990).

The conceptual distinctions of risky driving behavior as lapses, errors, and violations are essential and recommended by scholars several decades ago. The rationale is that errors, lapses, and violations have different psychological origins, which call for distinct intervention strategies (Parker et al., 1995; Reason et al., 1990). Recently, researchers have started to recommend the need for conducting research that takes into account the specific nature of driving behavior (Wan, Yan, Liu, Mao, & Wang, 2023). However, several research works on road traffic accidents continue to construe risky driving behavior as a single, one-dimensional construct (Alonso, Pastor, Montoro, & Esteban, 2015; Muluken et al., 2023; Alemu & Habtamu, 2019). Researchers often focus primarily on the overall identification of dangerous driving rather than the specific behaviors, such as speeding and lane violations, which hardly help to design targeted improvements in traffic safety measures (Wan et al., 2023). In line with this, WHO (2022) safe system approach suggests one of the specific driving behaviors, i.e., safe speeds, as one of the interventions to eliminate fatal crashes and reduce serious injuries.

Consequently, conceptualizing risky behavior as a one-dimensional construct could result in erroneous conclusions, as it confounds the relationship between specific risky behaviors and psychosocial factors (Parker et al., 1995; Reason et al., 1990). Moreover, it does not clearly indicate which psychosocial variables are responsible for causing specific behaviors, which in turn limits the efficacy of interventions aimed at decreasing road traffic accidents (Wan et al., 2023). Hence, we propose the reconceptualization of risky behavior into its constituents: lapses, errors, and violations of traffic rules and regulations, and show how these constructs relate to psychosocial dimensions of drivers, as suggested by different scholars (Parker et al., 1995; Reason et al., 1990; Wan et al., 2023).

In addition, although Ethiopia has undertaken many interventions based on its available resources and institutional capacities, the trends RTAs show an increase of about 9% on average from 2010 to 2018 (Debela, 2019). Given the increasing magnitude and severity of road traffic accidents in Ethiopia, research works seem to have been given less attention (Dagne, Hassen, Fekede, Melake, & Tesfaye, 2020; Micheal, Asfawesen, Ararso, & Tariku, 2023). Accordingly, the aim of this research is to split risky driving behavior into its component parts [lapses (lack of concentration), errors (missing signals), and violations of traffic rules and regulations (speeding)], and show the relationship of SDC and psychosocial factors of drivers in Jimma Town and Kersa District to drivers' errors, lapses, and violations during driving. The study addresses the following research questions: To what extent do drivers' SDC and psychosocial factors predict lapses of concentration while driving? To what extent do the drivers' SDC and psychosocial factors predict drivers' errors while driving? And, to what extent do drivers' SDC and psychosocial factors predict violations of traffic rules and regulations while driving?

2. Conceptual Framework

Risky driving behaviors include speeding, driving under the influence of alcohol, driving drowsy, driving without wearing a seatbelt, using a phone while driving, and violating traffic laws (Abraham, Ameyu, Lakew, & Eshetu, 2011). These behaviors can be categorized as lapses, errors, and violations (Parker et al., 1995; Reason et al., 1990). Risky driving has been associated with drivers' socio-demographic characteristics (SDCs) such as age, education, and gender (Aluja, Balada, García, & García, 2023; Hassan & Abdel-Aty, 2013), as well as psychosocial factors (Haghdoust, Masoumi, Zavareh, Ebadi, & Moslehi, 2022; Zhang, Qu, Tao, & Xue, 2019).

Research findings indicate that young drivers engage in riskier behaviors and experience higher mortality rates (Alderman et al., 2018; Das, Avelar, Dixon, & Sun, 2018; Tefft, 2017). Evidence suggests that age is negatively correlated with lapses, errors, and violations (Aluja et al., 2023; Haghi et al., 2014; Lucidi et al., 2019; Nguetsa & Kouabenan, 2017). However, lapses are more prevalent among individuals over 50 years old (Haghi et al., 2014). Risky driving behaviors are more prevalent among less educated young males who operate motorized two- and four-wheelers (Komba, 2016).

Gender differences in driving behavior have also been observed, with women scoring higher on lapses and men exhibiting more violations (Lajunen, Sullman, & Gaygısız, 2022). A recent study explored the relationship between road rage and masculinity-femininity gender roles in young drivers (Deniz, Lajunen, Özkan, & Gaygısız, 2021). The findings revealed that masculinity and anger were positively associated with impolite behaviors in men, while femininity was negatively related to verbal aggression while driving. The literature indicates that men are generally more impulsive than women and tend to engage in riskier driving

behaviors (Cross, Copping, & Campbell, 2011). Such behaviors are notably more common among less educated young males who operate motorized two- and four-wheelers (Komba, 2016).

In some local studies, Muluken et al. (2023) found that socio-demographic and personal characteristics such as sex, monthly income, and educational status did not have a significant relationship with risky driving behavior. However, factors such as driving at night, driving for more than 8 hours per day, believing that one's income is insufficient, weak law enforcement, issues with training institutions, being a Bajaj driver, and being a non-governmental driver were significantly associated with risky driving behavior. Similarly, Abraham et al. (2011) indicated that respondents with secondary or high school education were more likely to engage in risky driving behaviors compared to those with university or college education. Additionally, individuals with higher incomes were at a greater risk of exhibiting risky driving behavior than those with lower incomes.

Psycho-social factors are also related to risky driving behavior, particularly personality traits. For instance, aggressiveness has been linked to a risky driving style (Aluja et al., 2023). Iancu, Hoge, and Olteanu (2016) conducted a meta-analysis examining the association between personality and aggressive driving. The finding indicates a significant relationship between neuroticism and agreeableness with risky driving, as well as a marginal association with extraversion. Additionally, a meta-analysis by Demir, Demir, and Özkan (2016) and evidence from Wang, Qu, Ge, Sun, and Zhang (2018) indicate that expressions of anger, both physical and verbal, are significantly associated with violations and errors in driving behaviors. Furthermore, risk preference and risk perception have both been shown to predict risky driving behaviors (Jing, Shan, & Zhang, 2023). In addition, individuals with certain personality traits, such as sensation-seeking or impulsivity, are more inclined to engage in risky driving behaviors (Haghdoust et al., 2022; Zhang et al., 2019). Risky driving behaviors are more prevalent among drivers who engage in substance use, including alcohol, and drugs (Gicquel et al., 2017; Talukder et al., 2022). Drivers who held supportive attitudes toward risky driving were also more likely to engage in such behaviors compared to those with unsupportive attitudes. Furthermore, drivers who did not receive advice about risky driving behavior from significant others were more likely to exhibit risky driving behaviors than those who did receive such advice (Abraham et al., 2011).

Traffic climate also plays a significant role in risky driving behavior. Traffic climate refers to the attitudes of road users towards the traffic context, and it is assumed that perceived traffic climate can influence drivers' behaviors (Üzümçüoğlu & Özkan, 2019). Studies in the literature support the assumption that perceived traffic climate is closely related to driver behaviors (Chu, Wu, Atombo, Zhang, & Özkan, 2019; Gehlert, Hagemester, & Özkan, 2014). As drivers perceive their traffic context as less internally demanding (i.e., involving internal requirements) and more externally demanding (i.e., involving external affective demands), they report higher rates of violations (Chu et al., 2019; Gehlert et al., 2014) and errors (Chu et al., 2019). The findings regarding the relationship between functionality and violations are contradictory; they suggest a negative relationship for Chinese and Turkish samples (Chu et al., 2019) but a positive relationship for the German sample (Gehlert et al., 2014). In our study, we utilized the functionality dimension of the traffic climate scale (TCS) to reflect the characteristics of a functional traffic system.

Based on the backdrop indicated above, we have developed the following conceptual framework. The framework delineates the SDC, psychological and social factors relate to risky driving behaviors (lapses, errors, and violations). In this research, we aim to show the relationship of SDC, psychological and social factors to risky driving behaviors (lapses, errors, and violations).

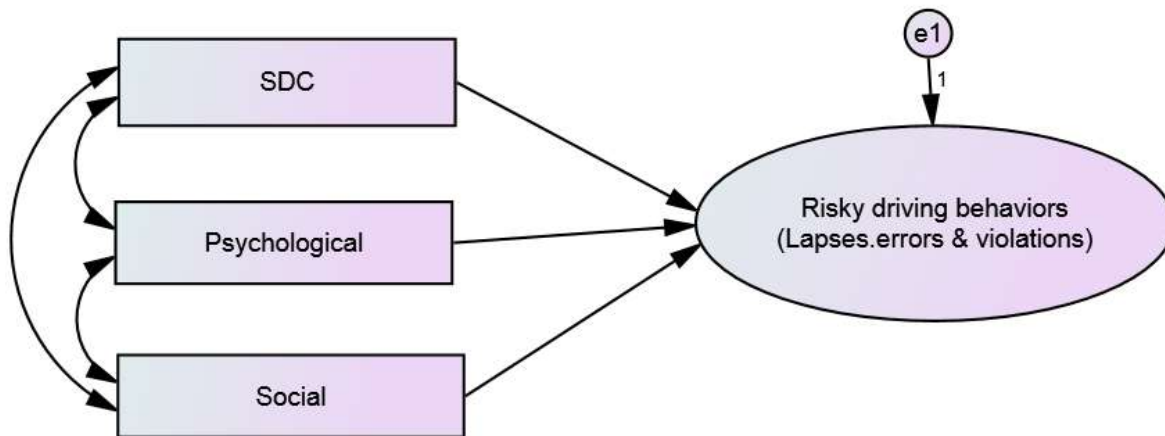


Figure 1: Conceptual framework of the study (Developed based on literature analysis)

3. Methods and Materials

3.1 Study Settings

The study was conducted in Jimma Town and Kersa District, located in the Jimma Zone of the Oromiya region, Ethiopia. Jimma Town and Kersa District are situated in southwestern Ethiopia, approximately 357 kilometers away from the capital, Addis Ababa.

3.2 Participants, Sample Size and Sampling Technique

A community-based study was conducted to examine the relationship of SDC and psychosocial factors of drivers' to drivers' errors, lapses, and violations in Jimma Town and Kersa District. Jimma Town was selected mainly due to its large flow of traffic, while Kersa District was chosen because of the highest incidences of road traffic accidents in the area, as revealed by the Zone Road Transport Authority. Memon et al. (2020) suggested taking between 160 and 300 samples for multivariate statistical analysis techniques. Accordingly, we took 181 drivers. A single-stage cluster sampling technique was employed to select drivers. First, five urban and three rural Kebeles were selected randomly from Jimma Town; Kersa District was selected purposely. Then, we identified the stations where we could find drivers in these clusters (selected Kebeles and Districts). The identified stations at Jimma Town were Merkato, the main bus station (old), the bus station around CBE and bajage station (Kochi), and we identified bus station, motor and bajage areas at Kersa District. Finally, data were collected for a day from 181 drivers located at the different stations/clusters.

3.3 Instruments

We utilized a shortened version of the Driver Behavior Questionnaire (DBQ), which included information on Socio-Demographic Characteristics (SDC) and comprised 11 items. Participants rated these items on a five-point scale, ranging from 1 (Never) to 5 (Always). The DBQ contained six domains: a single item for measuring drivers' error, lapse, violation, and hostile personality, five items for fatigue, and two items for risk-taking personality. Additionally, three items for measuring substance and alcohol use, and six items to measure traffic climate were administered, with which participants rated the items on five-point scale (1: Strongly Disagree to 5: Strongly Agree). The DBQ was adapted from Smith (2016). The shortened version of the DBQ demonstrated acceptable psychometric qualities in various studies. The authors developed and included measures for drug and substance use and the traffic climate, taking into account the specific realities of the city and district. These measures were subjected to expert analysis for their organization, readability, and item coverage. The experts confirmed that the various scales accurately measured what they intended to measure.

Table 1

Cronbach's alphas coefficients

Scales	No of Items	alpha
Fatigue	5	.777
Risk taking	2	.835
Drug and Substance Abuse	3	.830
Traffic climate	6	.720

A pilot test was conducted on thirty-two drivers taken from Mendera Kochi Village to check the reliability of different scales. Table 1 indicates the Cronbach's alpha reliability estimates for the scales ranged from 0.720 to 0.835, which is considered acceptable.

3.4. Procedures

We obtained a letter of support from the College of Social Science and Humanities, at Jimma University. The data collection process was conducted by trained data collectors who held a Master's degree in Health, Education, or Psychology. These data collectors were selected for their expertise and familiarity with the context, ensuring high-quality data collection procedures. The data collectors spent a day in the selected areas to collect the data, which took an average of 15-20 minutes per a driver.

3.5 Analysis

A hierarchical multiple regression analysis was used to identify the SDC and psychosocial factors predicting driving errors, lapses, and violations. The researchers tested the multiple regression assumptions for all dependent variables across the independent variables, as suggested by Field (2009). The assumptions of linearity, multicollinearity, independence, and homoscedasticity were all met. However, the assumption related to the normal distribution of residuals was slightly violated. While the researchers noted that only extreme deviations from normality are likely to have a significant impact, they acknowledged this limitation. Overall, the hierarchical multiple regression analysis was conducted after ensuring that the key assumptions were met, with the exception of a minor violation of the normality of residuals assumption, and the researchers concluded that the results are likely to be valid.

3.6 Ethical Consideration

The research began by clearly explaining the purpose of the study to the participants. Verbal consent was obtained from all participants prior to data collection, ensuring their willingness to take part in the study. Confidentiality and anonymity were strictly maintained throughout the process by de-identifying all data collected. To further protect the privacy of the participants, the researchers only reported aggregate statistics, rather than individual-level data. These ethical measures were put in place to uphold the rights and well-being of the study participants as we have included some sensitive items.

4. Results

4.1 Socio-demographic Characteristics of Respondents

A total of 181 drivers participated in the study. The Socio-demographic Characteristics of Respondents are summarized in Table 2.

Table 2

Socio-demographic characteristics (SDC) of participants

	Variables	F	%
Location	Jimma City	147	81.2
	Kersa Wereda	34	18.8
Education level	BA/BSC	3	1.7
	Diploma	25	13.8
	High school completed	125	69.1
	Primary or junior complete	19	10.5
	Can read write but no formal education	7	3.9
Sex	Male	180	99.4
	Female	1	.6
Marital status	Married	101	55.8
	Single	77	42.5
	Divorced	2	1.1
	Widowed	1	.6
Ownership of the vehicle	Government	5	2.8
	Non-government	40	22.3
	Personal property	92	51.4
	Other	42	23.5
Type of vehicles	Taxi	24	13.3
	Bus	4	2.2
	Automobile	30	16.6
	Pick up	3	1.7
	Bajaj	79	43.6
	Motorbike	13	7.2
	Other	28	15.5

Thirty-four (18.8%) participants were recruited from various locations in Kersa District, including Bajaj, motorbike, and bus station areas. The remaining 147 (81.2%) participants were taken from hot spot areas at Jimma Town, such as Merakto, the bus station around the main Commercial Bank of Ethiopia (CBE), the old bus station, and the Bajaj station near Koche. The majority of the participants were high school graduates (125, 65.9%), followed by diploma holders (25, 13.8%). The sample was predominantly male, with 180 (99.4%) males and only 1 (0.6%) female. Most participants were married (101, 55.8%), and 92 (51.4%) owned the car they drove. Bajaj drivers made up the largest group, accounting for 79 (43.6%) of the participants. The age of participants ranged from 19 to 55 years, with a mean age of 29.37 (median = 29.00) and a standard deviation of 5.79. Driving experience varied from 1 to 21 years, with a mean of 5.12 years (median = 4.00) and a standard deviation of 3.49.

4.2. Relationship of Psychosocial Variables to Drivers' Lapses

First we presented the zero-order correlation of SDC and psychosocial factors to drivers' errors, lapses and violations during driving. Then the hierarchical regression follows for each.

Table 3

The zero order correlation between SDC and drivers' lapses

	1	2	3	4	5	6	7	8
1 Site	1							
2 Age	.150*	1						
3 Education	.032	-.132	1					
4 Type	-.007	-.239**	-.241**	1				
5 Experiences	.052	.533**	.055	-.230**	1			
6 Marital status	-.021	-.609**	-.028	-.002	-.463**	1		
7 Ownership	-.082	.203*	-.077	.451**	-.024	-.120	.1	
8 Lapses	-.075	.049	.009	-.034	-.003	.041	.079	1

*. Correlation is significant at the 0.05 level (2-tailed).

**.. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 3, none of the socio-demographic variables [site (rural vs. urban), drivers' age, education level of drivers (high school and above vs. primary), type of vehicles (four wheels vs. three and two wheels), drivers experiences, marital status and vehicle ownership] demonstrated a significant relationship with lapses. Specifically, the relationship between these variables and lapses in concentration was non-significant, with p-values greater than 0.05.

Table 4

The zero order correlation between psychosocial variables and drivers' lapses

	1	2	3	4	5	6
1 Hostile personality	1					
2 Fatigues	.024	1				
3 Risk taking	.145	.515**	1			
4 Substance use	.020	.258**	.237**	1		
5 Traffic climate	.038	-.016	-.159*	-.039	1	
6 Lapses	.411**	.104	.034	-.043	-.046	1

*. Correlation is significant at the 0.05 level (2-tailed).

**.. Correlation is significant at the 0.01 level (2-tailed).

As shown in table 4, hostile personality had a statistically significant positive relationship with drivers' lapses ($r = 0.411$, $p = 0.01$). However, the other psychosocial variables did not have a significant relationship with lapses, $p > .05$.

We conducted a regression analysis using only the measure of hostile personality. The result is summarized in table 5.

Table 5

The beta coefficients and t-value for predictors of drivers' lapses

	b	Std. error	B	t	sig
Constant	1.115	.129		8.618	.000
Hostile personality	.297	.050	.411	5.977	.000

The results showed that drivers' hostile personalities accounted for nearly 17% of the variance in lapses. Specifically, hostile personality significantly predicted drivers' lapses ($R^2=16.9\%$, $b=.297$, $t=5.98$, $p=.001$).

4.3 Relationship of Psychosocial Variables to Drivers' Errors

We conducted correlation analysis to see the relationship of psychosocial variables to drivers' errors. The result is summarized in table 6.

Table 6

The correlation between SDC and drivers' errors in driving

	Site	Age	Education	Vehicles	Experience	Marital status	Ownership	Error
Error	.092	-.040	-.090	.107	.100	.078	.159	1

As shown in Table 6, none of the socio-demographic variables [site (rural vs. urban), drivers' age, education level of drivers (high school and above vs. primary), type of vehicles (four wheels vs. three and two wheels), drivers experiences, marital status and vehicle ownership] had a significant relationship with drivers' errors during driving. Specifically, the relationship between these variables and drivers' errors was very weak and non-significant, with p-values greater than 0.05.

Table 7

The zero order correlation between psychosocial variables and drivers' errors

	Hostile personality	Fatigue	Risk taking	Substance use	Traffic climate	Error
Error	.471**	.035	.054	.062	.019	1

** . Correlation is significant at the 0.01 level (2-tailed).

Regarding the relationship of psychosocial variables and drivers' errors (Table 7), hostile personality had a statistically significant positive relationship with drivers' errors ($r = 0.471$, $p = 0.01$). However, all the other psychosocial variables did not demonstrate a significant relationship with drivers' errors, with p-values greater than 0.05.

We conducted a regression analysis using only the measure of hostile personality. The result is summarized in table 8.

Table 8

The beta coefficients and t-values for predictors of drivers' errors

	b	Std. error	B	t	sig
Constant	1.138	.137		8.308	.000
Hostile personality	.372	.053	.471	7.08	.000

The result showed that drivers' hostile personalities accounted for nearly 22% of the variance in drivers' errors. Specifically, hostile personality significantly predicted drivers' errors while driving ($R^2=21.7\%$, $b=.372$, $t=7.08$, $p=.001$).

4.4 Relationship of Psychosocial Variables to Violations

We conducted correlation analysis to see the relationship of psychosocial variables to drivers' violations. The result is summarized in table 9.

Table 9

The correlation between SDC and violations of traffic rules and regulations

	Site	Age	Education	Vehicles	Experience	Marital status	Ownership	Error
Violations	.046	.034	-.040	.043	.057	-.065	.061	1

As shown in Table 9, none of the socio-demographic variables [site (rural vs. urban), drivers' age, education level of drivers (high school and above vs. primary), type of vehicles (four wheels vs. three and two wheels), drivers experiences, marital status and vehicle ownership] had a significant relationship with violations of traffic rules and regulations. The relationship between these variables and violations was very weak and non-significant, with p-values greater than 0.05.

Regarding the psychosocial variables, the analysis revealed several significant relationships with violations of traffic rules and regulations. The result is summarized in table 10.

Table 10

The correlation between psychosocial variables and violations in driving

	Hostile personality	Fatigue	Risk taking	Substance use	Traffic climate	Violations
Violations	.317**	.149*	.183*	.253**	-.006	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Hostile personalities had a statistically significant positive relationship with of violations traffic rules and regulations ($r = 0.317$, $p = 0.01$). Similarly, fatigue ($r = 0.149$, $p = 0.05$), risk-taking ($r = 0.183$, $p = 0.05$),

and substance use ($r = 0.253$, $p = 0.01$) all demonstrated statistically significant associations with violations of traffic rules and regulations. In contrast, traffic climate did not have a significant relationship with violations of traffic rules and regulations.

We conducted a hierarchical stepwise linear regression analysis, including only the psychosocial variables that had a statistically significant relationship with driving violations: hostile personalities, substance use, fatigue, and risk-taking. The result is summarized in table 11.

Table 11

The beta coefficients and t-values for predictors of violations in driving

Variables	b	Std. error	B	t	Sig
Constant	1.073	.188		5.704	.000
Hostile personality	.246	.055	.312	4.503	.000
Substance and drug use	.345	.097	.247	3.560	.000

The results showed that the linear combination of drivers' hostile personalities and substance use accounted for 16.1% of the variance in violations of traffic rules and regulations. Specifically, hostile personality accounted for 10% of the variance, while substance use accounted for the remaining 6.1%. Hostile personality significantly predicted drivers' violations of traffic rules and regulations ($R^2_{hp}=10\%$, $b=.246$, $t=4.503$, $p=.001$). Similarly, substance use significantly predicted drivers' violations of traffic rules and regulations ($R^2_{su}=6.0\%$, $b=.345$, $t=3.56$, $p=.001$). The other variables, including fatigue and risk-taking, did not significantly predict drivers' violations of traffic rules and regulations.

5. Discussion

The findings of this study revealed that SDC did not predict driving errors, lapses, or violations. This contradicts the findings of several previous researchers. For instance, past studies have found that riskier and unsafe driving behaviors were more prevalent among less educated individuals (Komba, 2016). Additionally, some researchers have reported that aberrant driving behaviors declined with increasing age (Haghi et al., 2014; Ngueutsa & Kouabenan, 2017) although lapses were more common in individuals over 50 years old (Haghi et al., 2014). The inconsistency between the current findings and previous research may be due to the conceptual definitions used in this study, which differentiated between driving errors, lapses, and violations, whereas prior studies often considered risky driving behavior as a general construct.

The study findings revealed that hostile personalities significantly predicted drivers' lapses, errors, and violations consistent with the findings of Demir et al., (2016); Iancu et al., (2016) and Wang et al. (2018). Parker et al. (1995) and Reason et al. (1990) also indicated that impulsiveness can result in a lack of thoroughness in decision-making, which in turn can contribute to road traffic accidents. Additionally, the study found that drug and substance use significantly predicted driving violations. This finding aligns with previous research, which has shown that driving under the influence of alcohol or other substances can alter driving ability and behavior, significantly increasing the risk of being involved in a fatal crash or sustaining serious injuries (Alonso et al., 2015; Lin et al., 2022). Moreover, reckless driving behaviors, including drunk-driving and chewing khat while driving, appear to be more crucial in causing safety issues (UNEC, 2020).

Contrary to some previous studies, SDC, fatigue, risk-taking personality, and traffic climate did not significantly predict driving lapses, errors, or violations. For instance, Ulleberg (2001) had indicated the importance of these factors in predicting risky driving behaviors. The reasons for the inconsistencies between the current findings and previous research may lie in the approach taken in this study. Here, risky driving behavior was separated into its component parts, namely errors, lapses, and violations (Parker et al., 1995; Reason et al., 1990) whereas some recent studies have often conceptualized risky driving behavior as a single construct (Alemu & Habtamu, 2019; Alonso et al., 2015; Muluken et al., 2023). This more nuanced approach may have revealed differences in the predictive power of the various factors when considering the specific driving outcomes. The separation of risky driving into its constituent elements may have uncovered these distinctions (Wan et al., 2023), leading to the divergent findings compared to previous literature.

6. Conclusion

The objective of this research was to examine the relationship between drivers' SDC and psychosocial factors to drivers' errors, lapses, and violations. By separating risky driving behavior into its component parts, the study aimed to provide a more nuanced understanding of these relationships. However, the study has several limitations. As a correlation study, it cannot establish causal relationships of SDC and psychosocial factors to driving errors, lapses, and violations. Additionally, the limited geographic coverage of the sample restricts the generalizability of the findings. The use of self-report questionnaires may introduce the potential for social desirability and memory biases. Despite these limitations, the following conclusions can be drawn from the study.

Socio-demographic characteristics did not predict driving errors, lapses, or violations, contradicting some previous research findings. This inconsistency may arise from the current study's approach of breaking down risky driving behavior into specific components, whereas previous research has typically treated it as a single construct. Hostile personalities (aggressive behavior) significantly predicted drivers' lapses, errors, and violations, consistent with earlier studies suggesting that impulsiveness can lead to a lack of thoroughness in decision-making, contributing to road traffic accidents. Drug and substance use significantly predicted driving violations, aligning with previous research indicating that driving under the influence of alcohol or other substances can alter driving ability and behavior, significantly increasing the risk of crash involvement and serious injuries. Thus, it seemed that the conceptual distinction of risky driving behavior as lapses, errors, and violations is partially justifiable, though several research works are needed.

7. Implications

The magnitude of RTAs is alarmingly increasing, despite various strategies designed and implemented over several decades. This trend underscores the need for alternative approaches to tackle this pressing issue. The findings in this research provide valuable insights and a fresh perspective for policymakers, researchers, and practitioners involved in the prevention of road traffic accidents. The study presents the following theoretical and practical implications.

With respect to the theoretical implications, this study suggests that researchers should place greater emphasis on the concept of risky driving behavior, which is a multifaceted construct comprising distinct components such as driver errors, lapses, and violations. Despite this complexity, many studies continue to treat risky driving behavior as a single, undifferentiated construct. Even when researchers use specific terms like

speeding or seat belt use in their analyses, they often revert to the general term "risky driving behavior" in their reports and communications. This one-dimensional perspective hampers efforts to mitigate RTAs, as each component requires tailored intervention strategies. Therefore, future researchers should be more precise in their investigations and reporting of risky driving behavior, acknowledging its multidimensional nature. This approach will enhance understanding of the underlying factors contributing to RTAs and facilitate the development of targeted interventions that address the specific needs of each component.

For practical implications, prioritizing driver personality is essential in preventing errors, violations, and lapses, alongside addressing issues related to alcohol and substance use in traffic violations. Currently, driver training programs in Ethiopia primarily focus on vehicle mechanics, while driver behavior receives minimal attention. Many trainers also lack proper qualifications, which undermine the effectiveness of these programs (UNEC, 2020). Therefore, the study emphasizes that the psychological aspects of drivers should receive due attention during training programs. Additionally, the legal maximum blood alcohol concentration is set at 0.04 g/dl for breath tests and 0.08 g/dl for blood tests, applicable to all age groups. However, it is crucial to establish separate alcohol limit restrictions for young and professional drivers, as younger individuals are at a higher risk of alcohol-related road crashes (UNEC, 2020).

Acknowledgements

The authors are grateful to Jimma University for funding the research. The participants of the study are also acknowledged for providing the data required for the study.

Authors' contributions

- A. 1-4 Conceptualized the research, drafted the methodology, collected data
- B. 1 Analyzed the data and prepared manuscript
- C. 2-4 read and revised the manuscripts
- D. All authors have read and agreed to the publication of the manuscripts.

Authors' Details

- 1) Kinde Getachew Abebe, Department of Psychology College of Education and Behavioural Sciences, Jimma University. Email: kinde.getachew@ju.edu.et
- 2) Nega Jibat Gemedo, Department of Sociology, College of Social Sciences and Humanities, Jimma University. Email: negajibat@gmail.com
- 3) Getachew Tilahun Wakene, Department of Communication and Media Studies, College of Social Sciences and Humanities, Jimma University. Email: getachewtil@yahoo.com
- 4) Dejene Gemechu Chala, Department of Social Anthropology, College of Social Sciences and Humanities. Email: sachekebo@gmail.com

Competing of Interest

The authors declare that there is no conflict of interest.

Consent for publication

The authors agreed to submit to the Journal of Social Sciences and Language Studies and approved the manuscript.

Corresponding author's signature: Kinde Getachew



Funding

The corresponding author disclosed that he received funding from Jimm University.

Publisher's Note. Jimma University is neutral with regard to jurisdictional claims in published material and affiliations.

References

- Abraham, H., Ameyu, G., Lakew, A., & Eshetu, G. (2011). Risky driving behaviors for road traffic accident among drivers in Mekele city, Northern Ethiopia. *BMC Research Notes* 4(1), 1-6. doi: 10.1186/1756-0500-4-535.
- Alderman, E. M., Johnston, B. D., Breuner, C., Grubb, L. K., Powers, M., Upadhyia, K., & al., e. (2018). The teen driver. *Pediatrics* 142:e20182163. doi: 10.1542/peds.2018-2163.
- Alemu, D., & Habtamu, K. (2019). Psychosocial factors as predictors of risky driving behavior and accident involvement among drivers in Oromia Region, Ethiopia. *Heliyon*, 5(6), e01876. <https://doi.org/10.1016/j.heliyon.2019.e01876>.
- Alonso, F., Pastor, J. C., Montoro, L., & Esteban, C. (2015). Driving under the influence of alcohol: frequency, reasons, perceived risk and punishment. *Substance abuse treatment, prevention, and policy*, 10(1), 1-9. <https://doi.org/10.1186/s13011-015-0007-4>
- Aluja, A., Balada, F., García, O., & García, L. (2023). Psychological predictors of risky driving: The role of age, gender, personality traits (Zuckerman's and Gray's models), and decision-making styles. *Frontiers in Psychology*, 14:1058927. doi: 10.3389/fpsyg.2023.105892.
- Chu, W., Wu, C., Atombo, C., Zhang, H., & Özkan, T. (2019). Traffic climate, driver behaviour, and accidents involvement in China. *Accident Analysis & Prevention*, 122, 119-126. <http://dx.doi.org/10.1016/j.aap.2018.09.007>.
- Cross, C. P., Copping, L. T., & Campbell, A. (2011). Sex differences in impulsivity: a meta-analysis. *Psychol. Bull.* 137(1), 97–130. doi: 10.1037/a0021591.
- Dagne, G., Hassen, A., Fekede, K., Melake, D., & Tesfaye, G. (2020). Road traffic accidents fatality and associated factors in Southwest Shoa, central Ethiopia. *East African Journal of Health and Biomedical Sciences*, 4(1), 35-46. <http://ejol.ethernet.edu.et/index.php/EAJHBS/article/view/1468/1080>
- Das, S., Avelar, R., Dixon, K., & Sun, X. (2018). Investigation on the wrong way driving crash patterns using multiple correspondence analysis. *Accid. Anal. Prev.* 111, 43–55. doi: 10.1016/j.aap.2017.11.016.
- Debela, D. J. (2019). Road traffic accident in Ethiopia from 2007/08-2017/18. *American International Journal of Sciences and Engineering Research*, 2(2), 49-59. <https://doi.org/10.1313/aijser.v2i2.90>.
- Demir, B., Demir, S., & Özkan, T. (2016). A contextual model of driving anger: A meta-analysis. *Transportation Research Part F: Traffic Psychology and Behaviour*, 42(2), 332-349. <https://doi.org/10.1016/j.trf.2016.09.020>.
- Deniz, P., Lajunen, T., Özkan, T., & Gaygısız, E. (2021). Masculinity, femininity, and angry drivers: masculinity and femininity as moderators between driver anger and anger expression style among young drivers. *Accid. Anal. Prev.* 161(2):106347. doi: 10.1016/j.aap.2021.106347.
- Fana Broad Casting(FBC). (2021). Ethiopia reports 1,848 deaths due to road traffic accidents in 6 months. <https://www.fanabc.com/english/ethiopia-reports-1848-deaths-due-to-road-traffic-accidents-in-6-months/>.
- Field, A. (2009) *Discovering Statistics Using SPSS*. 3rd Edition, Sage Publications Ltd., London.
- Gehlert, T., Hagemester, C., & Özkan, T. (2014). Traffic safety climate attitudes of road users in Germany. *Transp. Res. Part F Traffic Psychol. Behav.* 26, 326–336. <https://doi.org/10.1016/j.trf.2013.12.011>.
- Gicquel, L., Ordonneau, P., Blot, E., Toillon, C., Ingrand, P., & Romo, L. (2017). Description of various factors contributing to traffic accidents in youth and measures proposed to alleviate recurrence. *Frontiers in psychiatry*, 8(JUN), 94. <https://doi.org/10.3389/fpsyg.2017.00094>.

- Haghdoust, Z., Masoumi, G., Zavareh, D. K., Ebadi, A., & Moslehi, S. (2022). A Systematic Literature Review of Driver's Sociocultural Factors Predisposing to Road Traffic Crashes. *Medical Journal of the Islamic Republic of Iran*, 36. DOI: 10.47176/mjiri.36.21.
- Haghi, A., Ketabi, D., Ghanbari, M., & Rajabi, H. (2014). Assessment of human errors in driving accidents; analysis of the causes based on aberrant behaviors. *Life Science Journal*, 11(9), 414-420. http://www.lifesciencesite.com/ljsj/life1109/067_25086life110914_414_420.pdf.
- Hassan, H. M., & Abdel-Aty, M. A. (2013). Exploring the safety implications of young drivers' behavior, attitudes and perceptions. *Accid. Anal. Prev.* 50, 361–370. doi: 10.1016/j.aap.2012.05.003.
- Iancu, A. E., Hoge, A., & Olteanu, A. F. (2016). The association between personality and aggressive driving: a meta-analysis. *Romanian J. Psychol.* 18(2), 24–32. https://www.rjap.psihologietm.ro/Download/rjap182_1.pdf
- Jing, L., Shan, W., & Zhang, Y. (2023). Risk preference, risk perception as predictors of risky driving behaviors: the moderating effects of gender, age, and driving experience. *Journal of Transportation Safety & Security*, 15(5), 467-492. <https://doi.org/10.1080/19439962.2022.2086953>.
- Komba, D. D. (2016). *Risk judgement, risk taking behaviour and road traffic accidents in Tanzania: Geographical analysis*. Thesis for the Degree of Philosophiae Doctor, Norwegian University of Science and Technology, Faculty of Social Sciences and Technology Management, Department of Geography, Trondheim, Norway. <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/2403537>.
- Kongcharoen, J., Onmek, N., Karrila, S., & Seksan, J. (2022). Risk factors related to road traffic accidents in Phuket Province, Southern Thailand: A confirmatory factor analysis. *Transactions on Transport Science*, 1, 1-9. <https://doi.org/10.5507/tots.2021.020>
- Lajunen, T., Sullman, M. J., & Gaygısız, E. (2022). Self-assessed driving skills and risky driver behaviour among young drivers: a cross-sectional study. *Front. Psychol.* 13, 840269. doi: 10.3389/fpsyg.2022.840269.
- Lin, H.-A., Chan, C.-W., Wiratama, B. S., Chen, P.-L., Wang, M.-H., Chao, C.-J., . . . Pai, C.-W. (2022). Evaluating the effect of drunk driving on fatal injuries among vulnerable road users in Taiwan: A population-based study. *BMC Public Health*, 22(1), 2059. <https://doi.org/10.1186/s12889-022-14402-3>.
- Lucidi, F., Girelli, L., Chirico, A., Alivernini, F., Cozzolino, M., & Violani, C., et al. (2019). Personality traits and attitudes toward traffic safety predict risky behavior across young, adult, and older drivers. *Front. Psychol.* 10:536. doi: 10.3389/fpsyg.2019.00536.
- Memon, M. A., Ting, H., Cheah, J. H., Thurasamy, R., Chuah, F., & Cham, T. H. (2020). Sample size for survey research: Review and recommendations. *Journal of Applied Structural Equation Modeling*, 4(2), 1-20. doi: 10.47263/JASEM.4(2)01.
- Micheal, A., Asfawesen, W., Ararso, B. O., & Tariku, B. (2023). Epidemiological characteristics of deaths from road traffic accidents in Addis Ababa, Ethiopia: A study based on traffic police records (2018–2020). *BMC emergency medicine*, 23(1), 1-6. doi: <https://doi.org/10.1186/s12873-023-00791-0>
- Muluken, C., Taye, A., Ababayehu, B., Getaneh, A., Nigus, K., Biniam, M., . . . Zemen, M. Y. (2023). Personal and driving related characteristics as predictors of risky driving behavior among drivers in Debre Tabor Town, Northwest Ethiopia: A mixed method study. *International Journal of Africa Nursing Sciences*, 19 (1) 100591. <https://doi.org/10.1016/j.ijans.2023.100591>.
- Nayum, A. (2008). *The role of personality and attitudes in predicting risky driving behavior*. Master of Philosophy in Psychology, Department of Psychology, University of Oslo.

- Ngueutsa, R., & Kouabenan, D. R. (2017). Accident history, risk perception and traffic safe behaviour. *Ergonomics*, *60*(9), 1273–1282. DOI: 10.1080/00140139.2016.1259508.
- Novikov, A., Shevtsova, A., & Vasilieva, V. (2020). Development of approach to reduce number of accidents caused by drivers. *Transportation Research Procedia*, *50*, 491–498. <https://doi.org/10.1016/j.trpro.2020.10.090>.
- Parker, D., West, R., Stradling, S., & Manstead, A. S. R. (1995). Behavioural characteristics and involvement in different types of traffic accident. *Accident Analysis & Prevention*, *27*(4), 571–581. [https://doi.org/10.1016/0001-4575\(95\)00005-K](https://doi.org/10.1016/0001-4575(95)00005-K).
- Peltzer, K., & Renner, W. (2004). Psychosocial correlates of the impact of road traffic accidents among South African drivers and passengers. *Accident Analysis & Prevention*, *36*(3), 367–374. [https://doi.org/10.1016/S0001-4575\(03\)00017-4](https://doi.org/10.1016/S0001-4575(03)00017-4).
- Reason, J., Manstead, A., Stradling, S., Baxter, J., & Campbell, K. (1990). Errors and violations on the roads: A real distinction? *Ergonomics*, *33*(10–11), 1315–1332. <https://doi.org/10.1080/00140139008925335>.
- Smith, A. P. (2016). A UK survey of driving behaviour, fatigue, risk taking and road traffic accidents. *BMJ Open*, *6*(8), e011461. <https://doi.org/10.1136/bmjopen-2016-011461>.
- Talukder, M. M. A., Mia, M., Chowdhury, N. S., Shaikh, N. U., Uddin, M. A., Alam, M., & Ismael, M. (2022). Smoking Behavior and Driver's Involvement in Road Traffic Accidents in Bangladesh. *International Journal of Mental Health and Addiction*, *21*(4), 2238–2254. doi: 10.1007/s11469-021-00719-44.
- Tefft, B. (2017). *Rates of motor vehicle crashes, injuries and deaths in relation to driver age, United States, 2014-2015*. AAA Foundation for Traffic Safety.
- Ulleberg, P. (2001). Personality subtypes of young drivers. Relationship to risk-taking preferences, accident involvement, and response to a traffic safety campaign. *Transportation Research Part F: Traffic Psychology and Behaviour*, *4*(4), 279–297. [https://doi.org/10.1016/S1369-8478\(01\)00029-8](https://doi.org/10.1016/S1369-8478(01)00029-8).
- UNEC. (2020). Road safety performance Review—Ethiopia. United Nations Economic Commission for Europe. <https://doi.org/10.18356/9789210055482>.
- Üzümcüoğlu, Y., & Özkan, T. (2019). Traffic climate and driver behaviors: Explicit and implicit measures. *Transportation Research Part F: Traffic Psychology and Behaviour*, *62*, 805–818. <https://doi.org/10.1016/j.trf.2019.03.016>.
- Wan, L., Yan, Y., Liu, C., Mao, T., & Wang, W. (2023). Characteristics and identification of risky driving behavior in expressway tunnel based on behavior spectrum. *International Journal of Transportation Science and Technology*, Available online, In Press, Corrected Proof, ISSN 2046-0430, <https://doi.org/10.1016/j.ijst.2023.10.006>.
- Wang, Y., Qu, W., Ge, Y., Sun, X., & Zhang, K. (2018). Effect of personality traits on driving style: psychometric adaption of the multidimensional driving style inventory in a Chinese sample. *PLoS One* *13*:e0202126. doi: 10.1371/journal.pone.0202126.
- WHO. (2022). Road safety. <https://www.who.int/health-topics/road-safety>.
- Yan, M., Chen, W., Wang, J., Zhang, M., & Zhao, L. (2021). Characteristics and causes of particularly major road traffic accidents involving commercial vehicles in China. *International Journal of Environmental Research and Public Health*, *18*(8), 3878. <https://doi.org/10.3390/ijerph18083878>.
- Zhang, X., Qu, X., Tao, D., & Xue, H. (2019). The association between sensation seeking and driving outcomes: A systematic review and meta-analysis. *Accid. Anal. Prev.* *123*, 222–234. doi: 10.1016/j.aap.2018.11.023.