

Disruption of Mobile Phone Use on Safety Riding Behavior of Online Ojek Drivers

Renny Septiari*, Reiny Ditta Myrtanti, Nelly Budiharti, Julianus Hutabarat.

Industrial Engineering, National Institute of Technology (ITN),
Bendungan Sigura-gura 2 Malang, Indonesia

*Corresponding Author: remmyseptiari@lecturer.itn.ac.id

***Abstract:** Cell phone is the main communication tool for online motorcycle taxi drivers. With the cell phone the drivers can work and do daily activities because of orders from customers through applications installed on cell phones owned by online ojek drivers. But the use of cell phones by drivers sometimes causes them to be less aware of their surroundings. Many times we find them driving while calling or even looking at messages without stopping driving, this of course can cause their attention and alertness to be disturbed due to lack of control from the continued use of cell phones. Ultimately, the safety of the drivers and surrounding drivers is jeopardized due to the improper use of cell phones. As a result of the use of cell phones while driving, there are many accidents that can eventually injure drivers and other motorists. The purpose of this study is to determine the relationship of cell phone use and the level of safety riding of online motorcycle taxi drivers. Some of the factors underlying the use of cell phones are related to job characteristics, namely driver behavior and traffic violations. In addition, the moderating effect of cell phone use, which is a predictor of safety riding, will be tested.*

Keywords: Online ojek, cell phone, safety riding.

1. Introduction

Driving requires skills and knowledge because it is a complex job. When driving, the driver is in contact with other vehicles and must be able to control all influences that are impulses from the environment. Some accidents that have resulted in fatalities recently often result in a loss of driver focus. As a driver, everyone has physical and psychological elements. Physical human factors that can influence accidents affect the nervous system, vision, and hearing, feelings, other senses (touch, smell), changes (boredom, drugs). While psychological elements such as motivation, intelligence, emotions, experience, maturity, and habits. These factors must be considered because they have the potential to cause harm.

According to WHO 2021, many traffic fatalities occur because drivers have distracted attention. In some countries, the term 'driver distraction' means that in addition to driving a driver also performs secondary tasks such as talking to passengers, adjusting/controlling information on their cell phone. However, cell phone-related distractions, such as texting while driving, have received particular attention as they are becoming increasingly common among drivers [1]. In developed countries such as Australia[2], UK[3] such incidents are common. Some analyses show that cell phone-related distractions impair driver reaction time and stimulus detection[4]. Cell phone use during driving is said to almost quadruple the likelihood of causing a driver to be involved in an accident [5]. Given the consequences and safety risks, the use of mobile phones while driving has been targeted by many people so that this kind of behavior can be changed for the safety and convenience of motorists on the road. As for efforts to reduce this behavior, it seems to have also been regulated in the Indonesian Law Number 22 of 2009 concerning Road Traffic and Transportation (LLAJ), the rule reads Playing mobile phones can interfere with concentration while driving which poses a danger to yourself and others.

And again there are still many drivers who violate as if they have not been deterred by the consequences that can be caused by the use of cell phones while driving. And a lot happens and seems to backfire because people change their behavior due to the use of the cellphone, where the

use is done secretly so that the connection is not interrupted [6]. A recent systematic review showed that a common problem when cell phone use is associated with the involvement of driving activities increases the likelihood of traffic events that compromise safety [7].

Therefore, this study is expected to provide some information about the relationship between cell phone use and safety riding. So that if it is bad for safety it should be eliminated from the habits of drivers, especially online motorcycle taxi drivers who usually use cell phones while driving.

2. Literature Review

Habit factors are often overlooked in studies investigating distraction arising from cell phone use while driving. This study examines the relationship between habits and mobile phone-related driver distraction in a model based on the Theory of Planned Behavior (TPB). In addition, it explores potential differences in behavior across urban and rural driving environments, and between men and women. An online survey was conducted in China with 1,016 respondents, measuring attitudes, subjective norms of perceived behavioral control, reported behaviors and habits related to mobile phone use while driving. Data were analyzed using a two-stage structural equation modeling approach. Results showed that the measurement model provided a good fit to the data and was invariant across urban and rural driving environments, as well as across gender. The latent path model investigating mediation also showed a good fit and revealed that the TPB variables (attitude, subjective norm, and perceived behavioral control) partially mediated the relationship between mobile phone-related habits and mobile phone use while driving. These findings suggest that the habit of using mobile phones while driving should be considered again regarding driving behavior as this may disturb the surrounding environment [8].

Nowadays, teenage drivers use cell phones more often while driving especially at night. And this has become a major cause of road accidents. However, limited attention has been paid to night driving distraction, therefore, the purpose of this study was to explore the interaction effects of cell phone use and time of day (day and night) on driving performance especially for teenage drivers. A total of 43 teenage drivers were involved in a driving simulator experiment with multiple subject role-specific designs that included three distractions (no distraction, talking and texting on a cell phone). This study used non-parametric tests to analyze the data and obtained the following results: (1) the standard deviation of lane position (SDLP) was not significantly different at both times, but was significantly higher at night. In addition, the respondents drove faster and gave less distance on small-radius curves on both distractions at night; (2) texting significantly increased SDLP, while there was less lateral variation during the talking task than without distraction on simple road sections; and (3) compared to experienced drivers, novice drivers drove faster during driving, talking on small radii but there was no significant difference between groups during the texting task. These findings provide theoretical and practical implications for relevant policy makers to improve traffic safety [9].

From some of the research that has been mentioned related to the dangers of using cell phones while driving, in the end it is necessary to know the relationship between cell phone use and safety riding of online motorcycle taxi drivers. Some of the factors underlying the use of cell phones are related to job characteristics, namely driver behavior and traffic violations. In addition, it will be tested the moderating effect of cell phone use, which is a predictor of safety riding as shown in Figure 1.

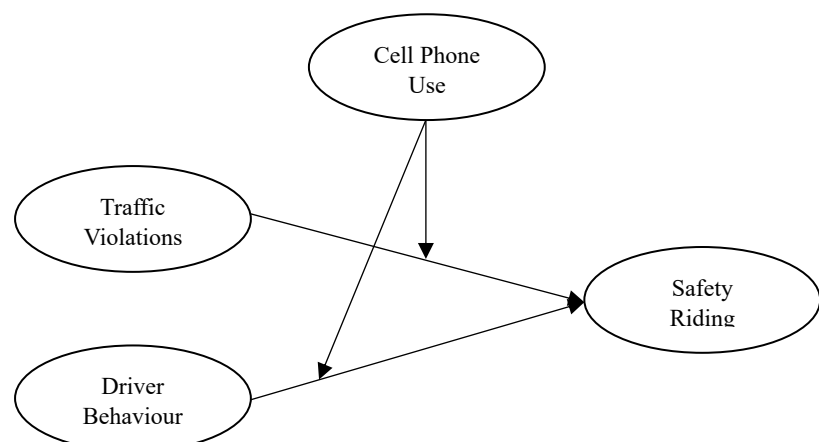


Figure 1. Research Model

From the explanation of figure 1, therefore the following hypothesis is presented:

H1. Traffic violations affect safety riding.

H2. Driver behavior affects safety riding.

H3. Traffic violations and driver behavior affect safety riding.

H4. Cell phone use affects safety riding

H5. Cellphone use moderates between traffic violations and safety riding.

H6. The use of cellphones moderates between driver behavior and safety riding.

3. Methodology

3.1. Participants

Participants or respondents in this study were 26 male online motorcycle taxi drivers. Data collection is done directly to the driver when meeting them. This is done because there is a brief explanation of the procedure for filling out the questionnaire given. There are 4 types of questionnaires given to respondents related to this study in accordance with the variables in the research model. In addition to explaining the filling procedure, some information was also conveyed regarding the purpose of this research to them. It was also conveyed that filling out this questionnaire is also confidential regarding the identity of the filler (anonimas), the right to resign at any time can be done and there are no right or wrong answers. After the respondents filled in the questionnaire, the researcher gave a small reward as a form of gratitude for their participation. It took about 45-60 minutes for the respondents to complete the four questionnaires.

3.2. Measures

A 4-point Likert-type scale was chosen for the scoring process of the questionnaires completed by the respondents who played a role in this research, with the descriptions 'strongly disagree; disagree; agree and strongly agree'. The 4-point option was chosen so that there is no neutral option that can make the answers of the respondents involved in filling out this questionnaire doubtful. According to [10], the Likert 4 scale has a simple scale so that it is easily understood by respondents, with only four answer options the Likert 4 scale allows for more specific and focused data collection, the Likert 4 scale can be used to compare research results with previous research using the Likert 4 scale or other Likert scales, the Likert 4 scale is easier to process and analyze than the Likert scale which has a longer scale, the Likert 4 scale can be used in various types of research, including social, psychological, business, and environmental research.

3.2.1. Use of Cellphone

It is not uncommon to use cell phones while driving by online ojek drivers. This is done so that the time used while working can be more efficient, but drivers do not realize the dangers of using cellphones while driving that can threaten themselves. It has been mentioned in the traffic law that the use of cell phones while driving is very dangerous for drivers. The use of cell phones while driving causes them to fail to respond to the situation around them. The reaction time becomes slower especially when the conversation on the cell phone is intense. The adverse effects of cell phone use in driving have been widely mentioned in studies such as those conducted (James McKnight, 1993; Caird, et.al., 2008) in [8]. Broadly speaking, the use of cell phones while driving has a negative effect on reaction time and vehicle control.

3.2.2. Traffic Signs

The existence of traffic signs around the highway certainly aims to facilitate motorists in carrying out their activities while on the highway. But it is not uncommon for drivers to ignore the traffic signs they pass by on the grounds that they are in a hurry, do not understand, are not visible, etc. Whereas the existence of these signs is as a guide for road users to be orderly, safe, and secure. Whereas the existence of these signs is as a guide for road users to be orderly, safe and comfortable while on the road. But in reality, traffic sign violations by drivers seem to be a common daily sight. The existence of traffic signs in the end does not seem too useful to be installed in that place. In Indonesia, there are still many drivers who 'like' violating traffic signs. Traffic sign violations are

based on Law of the Republic of Indonesia Number 22 of 2009 concerning Road Traffic and Transportation.

3.2.3. Driver Behavior

Drivers often engage in behaviors that pose risks to both themselves and other road users. Although many of these unsafe actions are taken, they are actively and consciously aware that they are breaking the rules. This is a result of mistakes due to inexperience, momentary preoccupation and inattention. Intentional or not, both rule violations and deficiencies in memory, judgment, or situational awareness can and do contribute to traffic accidents [11].

to traffic accidents [11]. Therefore, there is a need for tools that can measure these behaviors and the frequency of violations committed. In 1990, Reason, Manstead, Stradling, Baxter, and Campbell, introduced the Driver Behavior Questionnaire consisting of 50 questions self-administered by drivers, in which drivers rate the frequency of risky behaviors performed while driving. [12] identified nearly 200 studies that have used the DBQ in part or whole. [13] agreed that the DBQ is one of the most widely used instruments to measure driving behavior.

3.2.4. Safety Riding

The concept of safety riding means a form of driving behavior that is safe and comfortable for yourself and others, so that when driving the risk of unwanted things happening can be suppressed. The questionnaire on Safety Riding is taken based on Indonesian Law No. 22 of 2009, which outlines the rules of good traffic procedures. Among them are obliged to drive a motor vehicle reasonably and with full concentration, must use a helmet that meets national standards for motorcyclists. Safety riding behavior is very important to reduce the number of accidents and ensure the safety of riders and other road users [14].

4. Results

4.1. Reliability and Validity Assessment

For the validity of each question item of the 4 questionnaires distributed, the average was valid. Table 1 presents the statistical reliability results of the questionnaires and it can be shown that the reliability of all scales is quite good, with Cronbach's Alpha values ranging from 0.63 to 0.82.

Table 1. Reliability Statistic

Variabel	N of Items	Cronbach's Alpha	Cut off	Decision
Traffic Violations (X_1)	10	0,626	0,60	Reliabel
Driver Behaviour (X_2)	20	0,746	0,60	Reliabel
Cell Phone Use (M)	5	0,698	0,60	Reliabel
Safety Riding (Y)	18	0,821	0,60	Reliabel

4.2. Effect of Traffic Violation and Driver Behavior on Safety Riding

To determine the effect of Traffic Violation and Driver Behavior on Safety Riding, multiple regression tests were conducted. As shown in table 2a, that Traffic Violation and Driver Behavior together have a significant effect on Safety Riding with a value of Sig. $0,00 < 0,05$. But judging from table 2b, the situation changes when the variable stands alone. From table 2b. it is known that Traffic Violation has no effect on Safety Riding with a Sig value. $0,778 > 0,05$. While Driver Behavior has a significant effect on Safety Riding with a Sig value. $0,00 < 0,05$. This shows that Traffic Violations committed by online motorcycle taxi drivers do not make them aware of the importance of Safety Riding behavior. They prioritize getting to their destination quickly rather than behaving safety riding which in turn can bring safety to themselves. As shown in table 2b, that driver behavior affects the level of safety riding behavior. Which means that behaving right or wrong really depends on each personality.

Table 2a. Multiple Regression Results of Traffic Violations and Driver Behavior on Safety Riding

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	646.558	2	323.279	31.762	.000 ^a
	Residual	234.096	23	10.178		
	Total	880.654	25			

a. Predictors: (Constant), Driver Behaviour, Traffic Violations

b. Dependent Variable: Safety Riding

Table 2b. Multiple Regression Results of Traffic Violations and Driver Behavior on Safety Riding

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.421	6.337		1.171	.254
	Traffic Violations	-.043	.149	-.031	-.285	.778
	Driver Behaviour	.841	.107	.862	7.874	.000

a. Dependent Variable: Safety Riding

4.3. Cell Phone Use moderates between traffic violations and safety riding.

From table 3a. it is known that the effect of cell phone use on safety riding has a positive and significant effect with a sig value. $0,027 < 0,05$. Which means that the use of cell phones while driving affects the level of safety riding behavior of the driver. But in table 3b. when cell phone use interacts with traffic violations it has no effect on safety riding with a Sig value. $0.231 > 0.05$, which means that cell phone use is not a moderating variable for traffic violations on safety riding.

Table 3a. Results of Stage 1 Moderation Regression Test

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.605	9.234		3.423	.002
	Traffic Violations	.118	.254	.087	.465	.647
	Cell Phone Use	.975	.411	.441	2.370	.027

a. Dependent Variable: Safety Riding

Table 3b. Results of Stage 1 Moderation Regression Test

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-29.886	50.762		-.589	.562
	Traffic Violations	2.367	1.844	1.734	1.284	.212
	Cell Phone Use	4.925	3.234	2.231	1.523	.142
	TV x Cell Phone Use	-.144	.117	-2.566	-1.231	.231

a. Dependent Variable: Safety Riding

4.4. The Effect of Driver Behavior and Cell Phone Use on Safety Riding

From table 4a. it is known that the effect of cell phones on safety riding has no effect with a sig value. $0,091 > 0,05$. Which means that cell phone use does not affect the driver's safety riding behavior. The same can be seen in table 4b where the interaction between driver behavior and cell phone use has no effect on safety riding with a Sig.value of $0.835 > 0.05$, which means that cell phone use is not a moderating variable for driver behavior on safety riding.

Table 4a. Results of Stage 1 Moderation Regression Test

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.838	5.702		.498	.623
	Driver Behaviour	.775	.104	.794	7.416	.000
	Cell Phone Use	.417	.236	.189	1.762	.091

a. Dependent Variable: Safety Riding

Table 4b. Results of Stage 2 Moderation Regression Test

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.093	38.081		-.134	.895
	Driver Behaviour	.925	.721	.948	1.283	.213
	Cell Phone Use	.895	2.283	.405	.392	.699
	DB x Cell Phone Use	-.009	.043	-.305	-.211	.835

a. Dependent Variable: Safety Riding

4.5. Research limitations and future research

The research that has been done has some limitations with exceptions and also provides additional advice and input for potential research for further investigation, especially regarding the characteristics of online ojek jobs. Provides additional suggestions and input for potential research for further investigation, especially regarding the employment characteristics of online ojek.

The data collected and analyzed in this study are limited to one city in one country namely Malang, East Java, Indonesia and the results are not directly applicable to other research contexts, especially with different online ojek business topology and traffic environment. However, studies from various research contexts are encouraged to provide a more comprehensive understanding of employment, job characteristics, mobile phone use especially violations and safety riding on the incidence of traffic violations and behavior of online ojek drivers.

5. Conclusion

It is generally known how the use of cell phones while driving can bring danger both to the driver himself and to other motorists around him. In this study, the safety riding factor is the main focus of every variable effect that was tested including traffic violations, driver behavior and cell phone use while driving. It can be concluded:

1. Driver behavior affects the level of safety riding behavior. Which means that behaving right or wrong is a choice and depends on each personality. If drivers are aware that their bad behavior while driving on the highway will bring harm, they should behave in an orderly manner so that the driving atmosphere is safe and conducive.

2. The effect of cell phone use on safety riding has a positive and significant effect when viewed in relation to traffic violations. Explaining that drivers are aware that the careless use of cell phones and carried out while driving can affect the level of safety due to traffic violations committed.
3. The effect of cellphone use has no effect on safety riding when viewed in relation to driver behavior. Indicating that there are still many drivers who are less attentive and act at will when using cell phones on the highway. In the end, it can be concluded that driver behavior is determined by their respective personalities and attitudes.

References

- [1]. Schroeder et al., 2018. Conceptualization, Assessment, and Treatment of Traumatic Stress in First Responders: A Review of Critical Issues. Published in Harvard Review of Psychiatry 1 July, Psychology, Medicine.
- [2]. Oviedo Trespacios et al., 2017. Risk Factors Of Mobile Phone Use While Driving In Queensland: Prevalence, Attitudes, Crash Risk Perception, And Task-Management Strategies. PLoS ONE, Vol 12(9), Sep 6, 2017, Article 0183361, US: Public Library of Science. <https://doi.org/10.1371/journal.pone.0183361>
- [3]. Sullman et al., 2018. The Role Of Beliefs In The Use Of Hands-Free And Handheld Mobile Phones While Driving. Journal of Transport & Health (Elsevier), Volume 9, June 2018, Pages 187-194.
- [4]. Caird, Simmons, Wiley, Johnston, & Horrey, 2018. Does Talking on a Cell Phone, With a Passenger, or Dialing Affect Driving Performance? An Updated Systematic Review and Meta-Analysis of Experimental Studies. The Journal of the Human Factors and ergonomics Society, Vol.60, Iss.1, January 19.
- [5]. Dingus et al., 2016. Driver Crash Risk Factors And Prevalence Evaluation Using Naturalistic Driving Data. PNAS- Proceedings of the National Academy of Sciences 113 (10) 2636-2641, February 22.
- [6]. Truelove et al., 2023. External And Internal Influences On Mobile Phone Use While Driving: Combining The Theories Of Deterrence And Self-Determination. Transportation Research Part F: Traffic Psychology and Behaviour Volume 93, February 2023, Pages 280-293
- [7]. Rahmillah et al., 2023. Evaluating the Effectiveness of Apps Designed to Reduce Mobile Phone Use and Prevent Maladaptive Mobile Phone Use, Multimethod Study. Journal of Medical Internet Research, Delft University of Technology Vol.25, August 29.
- [8]. [Basar Demir, et.al.,2023. Cell Phone-Related Driver Distraction: Habits Predict Behavior Over And Above The Theory Of Planned Behavior Variables. Accident Analysis and Prevention (Elsevier) 192, 107200.
- [9]. Yingying Yan, et.al., 2022. Driving Distraction At Night: The Impact Of Cell Phone Use On Driving Behaviors Among Young Drivers. Transportation Research Part F: Psychology and Behaviour (Elsevier) 91, 401-413.
- [10]. Sugiyono, 2019. Metode Penelitian Kuantitatif, Kualitatif dan R&D. Bandung:Alphabet.
- [11]. Stanton & Salmon, 2009. Measuring Situation Awareness In Complex Systems: Comparison Of Measures Study. International Journal of Industrial Ergonomics, May 1.
- [12]. Winter dan Dodou, 2010. Five-Point Likert Items: T Test Versus Mann-Whitney-Wilcoxon. PARE-Practical Assesment Research & Evaluation, Volume 15, Number 11, October.
- [13]. Winter, Dodou & Stanton, 2015. A Quarter Of A Century Of The DBQ: Some Supplementary Notes On Its Validity With Regard To Accidents. Ergonomic (Taylor & Francis Online) Vol. 58, Iss.10, April 16.
- [14]. Septiari R and Budiharti N, 2022. The Correlation Of Safety Riding Knowledge And Traffic Accident Rates For Online Motorcycle Taxi Drivers In Malang City. November, World Journal Of Advanced Research and Reviews-Vol. 16, Iss: 2.