



# The Influence of Personality, Driver Stress and Driver Behavior as Mediator on Road Accident among bus Driver in Riau Province Indonesia

Fikri<sup>1\*</sup>, Rozmi Ismail<sup>2</sup> and Fatimah Wati Halim<sup>3</sup>

<sup>1,2,3</sup> School of Psychology and Human Development, Universiti Kebangsaan Malaysia, Bangi Selangor Malaysia,

\*Lecture Faculty of Psychology, Islamic University of Riau Indonesia

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## ABSTRACT

**Objective** – This study aims to examine the contribution of personality, stress of driver and driver behavior as a mediator on road accident among bus driver in Indonesia. The study adopts a survey method to elicit responses from a sample of 400 bus driver who were selected as a Respondent type. The brief purpose of the paper and illustrate the direction that is taken, whether it is empirical or theoretical testing in analyzing the research subject.

**Methodology/Technique** – The Data collecting using the Big Five Personality questionnaires, Driver Stress Inventory, Driver Behavior questionnaires and Road Accident Inventory. The data collected were analysis confirmatory factor analysis and Structural Equation Model (SEM).

**Findings** – The SEM results show that the model hypothesis predictor index of road accidents have a good match but personality factors do not have affect directly on road accident and the stress of driver and driver behavior have a significant effect on Road accident; therefore the model needs to be re-specified. All of the predictors have influenced for 4% of variance on road accidents. Two predictor variables were accounted for 24% of variance on the behavior of drivers. Stress drivers directly affecting road accidents by ( $\beta = .13$ ), and driver behavior ( $\beta = .07$ ). Two predictor variables on the driver behavior also reveals that the personality basis directly affects the behavior of the driver ( $\beta = .18$ ), followed by stress of the driver have a direct influence on the behavior of drivers ( $\beta = .38$ ). The factor of driver behavior error and lapses have strong effect to road accident

**Novelty** – The implication this study show that there is a need for an intervention program in order to reduce the prevalence of accident involvement due to personality factors. The latter should be focused on managing driving behavior.

**Type of Paper:** Empirical

**Keywords:** Driver Stress, Driver Behavior, Road, Accident, Indonesia.

**JEL Classification:** C99, Z10, Z19.

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## 1. Introduction

Road accidents are one of the major global public health concerns. Every day around the world, more than 3000 people die from road traffic injuries (Pedan & Hyder 2002). It is estimated that each year millions of people spend their time in hospitals after severe crashes and many will never be able to live or work as they

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\* Corresponding author:

E-mail: [fikri\\_idris@yahoo.com/fikri@psy.uir.ac.id](mailto:fikri_idris@yahoo.com/fikri@psy.uir.ac.id)

Affiliation: School of Psychology and Human Development, Universiti Kebangsaan Malaysia

used to do. According to the World Health Organization (WHO 2009), almost 1.3 million people were killed globally and 50 million people were injured per year due to road traffic accidents. Therefore, this is equivalent to an average of 3500 deaths per day and correspondingly, an average of 150 deaths per hour. International Traffic Safety Data and Analysis IRTAD (2010) predicted that worldwide 250 million people would be killed or seriously injured over the next 20 years. Moreover, WHO (2009) foretold that global road fatalities would reach 1.9 million by 2010. Without appropriate action, by 2020, road traffic injuries are expected to become the third leading contributor to the global burden of injuries (Pedan & hyder 2002).

In Asia, it is estimated that the number of fatalities is about 700,000 annually that is more than half of the world's road fatalities (Economic and Social Commission for Asian and the Pacific, ESCAP 2010). By 2020, it is estimated that two-thirds of the world road fatalities will occur in the region (ESCAP 2010). Traffic accidents and fatalities have tremendously risen in most developing countries around the world and Malaysia has not been spared from this. In fact, the nature of road safety issues in developing countries is different from that in developed countries. Jacobs, Aeron and A strop (2000) estimated that the majority of deaths (85%) from road crashes occur in developing countries and almost half occurs in the Asia-Pacific region. In Asia, most of those killed or injured in road accidents are vulnerable road user, especially motorcyclist. In East-Asian and Southeast Asian countries, more than two-thirds of the victims are motorcyclist (ESCAP 2010).

The case of road accident In Indonesia increased from year to year, according to the Global Status Report on Road Safety which is delivered by the WHO. Indonesia occupies the first level of road accident improvement. Indonesia reported an increase in the case of road accident by more than 80 percent. In Indonesia, the number who died as a result of road accident highway reaches 120 people per day.

Base on literature review the factors causing road accidents, human components are one of the largest contributors to the occurrence of road traffic accidents (Grayson and Maycock 1988). Review of accidents caused by human factors supported by Preston and Harris (1965) and Salleh (2008) who found that road accidents caused by four chief factors, namely human factors, mechanical, environmental and animal. But according to the four factors Engglaan (2008) factors of road accidents are caused by human factors. Human factors are the dominant factor that accounted for 80 % to 98 % of road accidents (Spring 2003, Yilmaz and Celik 2004, Rozmi 2006, Wundersitz 2008).

Driver behavior, stress driver and Personality is three aspect that is the focus of psychological studies scholars drive. Driver behavior is one of the main causes of the increasing number of road accidents and it is one picture of the vulnerability stemming from human factors (Spring 2003; Rozmi 2006), Besides that Driver stress is a significant safety problem, even for professional drivers (Evans & Johansson, 1998). Stress may impair performance through distracting the driver from maintaining safety, or through eliciting potentially dangerous coping strategies such as reacting aggressively to other traffic. Drivers differ considerably in their vulnerability to stress-related performance impairment. Personality traits of anxiety, depression and anger have all been implicated in accident risk (e.g., Beirness, 1993). There are multiple dimensions of stress vulnerability that predict both subjective stress response and performance change in empirical studies (see Matthews, 2002, for a review). Much previous research attention. Simulator studies have established that a stress vulnerability dimension labeled Dislike of Driving predicts both anxiety and impaired vehicle control and attention to task stimuli, especially under stressful conditions. Stress may also relate to risk-taking, but there is little direct evidence on this issue. According to the transactional theory of driver stress (Matthews, 2002), personality factors interact with situational demands to elicit cognitive processes that mediate the effects of driver stress vulnerability on both subjective outcomes (e.g., emotional distress) and objective outcomes (e.g., distraction, risk-taking). Consistent with theory, Dislike of Driving is associated with tension and perceptions of lack of control, whereas an Aggression dimension is related to anger and appraisals of other drivers as hostile.

## **2. Method**

### **2.1 Participant and Procedure**

The sample initially consisted of 400 bus driver from 13 cities in Riau Province Indonesia. Drivers were approach by a group of university student who were trained on data collection and interview techniques and only those who agree to fill out the questionnaire and have driving license included in the study. The participants were assured about anonymity and confidentiality of their respondent.

### **2.2 Instruments**

The Malaysia Version of Driver Behavior questionnaire (DBQ) (Afsane & Rozmi Ismail, 2013) with seven item addition items was used to measures driver behavior (Sumer, Ozkan & Lajunen, 2002) participant were asked to indicate how often they committed each the 35 behavior in the previous year on a 6-point (0=never, 5=Nearly all the time)

The Big Five Inventory (BFI, Benet-Martinez & Jhon, 1998) was employed to measure the five personality trait. The Big Five Inventory consist 44 items, allowing researchers quickly and efficiently assess the five personality Dimensions, the dimensions is openness, conscientiousness, extraversion, agreeableness, and Neuroticism.

The Stress Driver Inventory (DSI, Metthew, 2002) was employed to measure the five personality trait. The Driver Stress Inventory consist 40 items, allowing researchers quickly and efficiently assess the five driver stress Dimensions, the dimensions are disliked driving, aggressive, error, lapses and violent.

Demographics and accident history. The respondents of this research were asked to indicate their age, Frequency of driving, the number of accident and offenses during 5 years.

### **2.3 Statistical analyzes**

This study using structural Equation modeling (SEM) with multiple indicators for three constructs: Personality, Driver behaviors, and Road Accidents

In testing the purpose model, conventional, cut-off criteria and fit indices were used (Nebi Sumer & Lajunen,2005) this indices involved goodness of fit index (GFI), adjusted goodness of fit (AGFI), DF ratio and root mean squares error approximation (RMSEA).

## **3. Result**

### **3.1 Demographic Profile**

In this section, we discuss the results of the study that was done by the researcher. About descriptive data social-demographic risk drivers in the city of Pekanbaru, as seen in Table 1 below.

Table 1. Socio-Demographic Profile of Urban Public Transport Driver Course

Case		Frequency	Percentage
Age	20 - 30-year-old	109	27.3
	31 - 40-year-old	150	37.5
	41 - 50-year-old	105	26.3
	51 - 60 years old	36	9.0
Level of Education	Elementary School	34	8.5
	Junior Hight School	88	22.0
	Senior Hight School	252	63.0
	Degree	26	6.5
Salary	RP 1 million – 2 million	183	45.8
	Rp 3 million – 4 million	181	21.7
	Rp 5 million – 6 million	36	8.9

The study involved 400 respondents from drivers aged 20 to 30, a total of frequencies is 109 (27.3%), the age from 31 to 40, the frequencies are 150 ( 37.5 % ), the age of respondent from 41 to 51 years old a total of frequencies is 105 ( 26.3 % ). In terms of education, it was found that the majority of respondents had a low of education such as the frequencies of Junior Hight School is 88 (22.0%). The level of education Senior Height School, have frequencies is 252

(63.0 %) on the other hand the elementary school frequencies is 34 (8.5 %). In terms of driving license, a total of 100 people (20.25 %) did not have a driver's license and 300 (80.75 %) of drivers have a driver's license. In terms of salary, a total of 183 people (45.8 %) of drivers has a salary from 1 million until 2 million Rupiah. Whereas 183 people (21.7 %) drivers have a salary from 3 million until 4 million Rupiah.

Base on field studies that carried out by researchers, there are several types of risky driver behavior were found by researchers. All this types of risky driving behavior can be seen in Table 2.

Table 2. Type the At Risk Driving Behaviors in Pekanbaru Public Transport

Risky Driving Behaviour	Frequency	Percentage
Do Not Have a Driving License	100	25
Do Not Obey traffic signs	310	77.5
Not Wearing Seat Belts	250	62.5
Using mobile phone while driving	157	39.25
Exceeding Maximum speed	185	46.25
Driving with Excessive Passengers	130	32.5

The results of the descriptive analysis of high-risk behaviors have found that the majority of the 310 drivers was driving do not obey traffic signs (77.5%), not wearing seat belts as many as 250 drivers (62.5%), 185 drivers exceeding maximum speed (46.25% ). 157 drivers using mobile phone while driving (39.25%), 130 drivers driving with an excessive passenger (32.5%), and 100 drivers do have a driving license (25%). This indicates that the level of Risky Driving Behaviour of drivers has reached dangerous levels. Then we need an action to make a change for this risky driving behavior.

### 3.2 Confirmatory Factor Analysis (CFA)

The result of Measurement Model by Confirmatory Factor Analysis (CFA) find that The Model of measurement Personality, stress driver and Driver Behavior on Road Accident Involvement on Bus Driver in Riau Province Indonesia, based on this analysis researcher find that this model measurement yielded a good fit to data, the model show that with Chi-squares = 180.838, TLI: .922, The value of goodness of fit index

(GFI) = .933, DF ratio = 49, and root mean squares error approximation (RMSEA) = .082. The model of measurement factor personality, stress driver and driver behavior can see from table below:

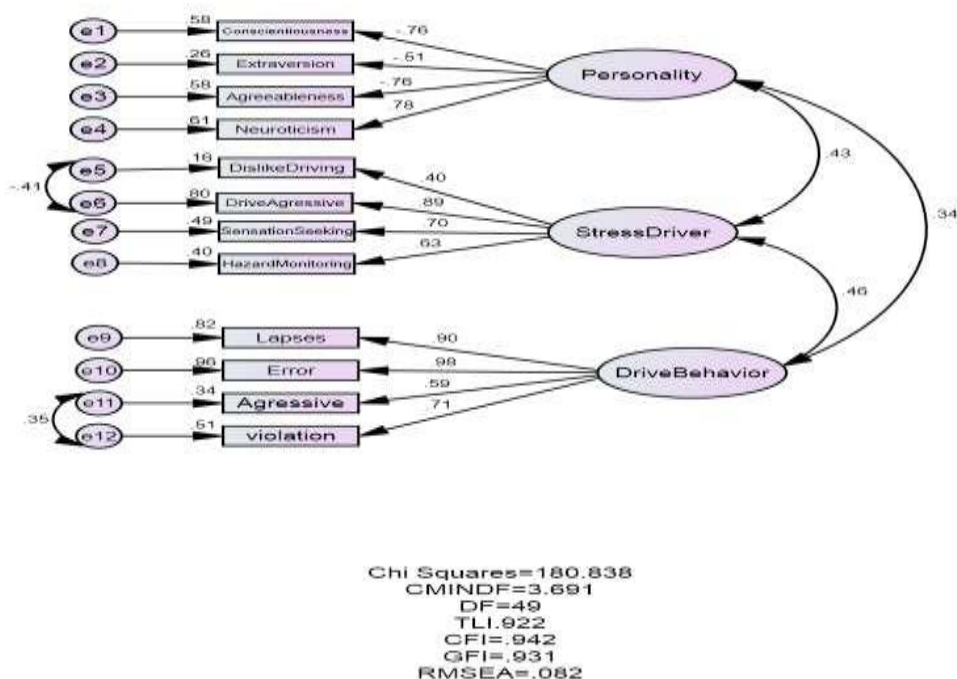


Figure 1: The Model of Measurement Big Five Personality, Driver Stress and Driver Behavior

### 3.3 Structural Equation modeling (SEM)

The result of hypothesis model by Structural Equation modeling (SEM) find that The Model of hypothesis Personality, stress driver and Driver Behavior on Road Accident Involvement on Bus Driver in Riau Province Indonesia, based on this analysis researcher find that this model measurement yielded a good fit to data, the model show that below:

The result of find that the model of personality, stress driver and driver behavior on road accident have a good fit with Chi-squares = 208.209, TLI = .912, the value of goodness of fit index (GFI) is = .926, DF ratio = 58, and root mean squares error approximation (RMSEA) = .081. The model of hyph personality can see from table below:

Supporting the mediated association, SEM analyzes revealed that all of the indirect effect of the big five factor on road accident among bus driver in Indonesia via aberrant driving behavior were statistically significant with path coefficient = 0.4. Finally, the personality factor and stress driver have significant influences the 24 % on driver behavior as mediator. The driving behavior has direct influences 7% of the variances in road accident among bus driver in Indonesia. The factor of driver behavior error and lapses have strong effect to road accident. You can see the result of the SEM analysis bellow in figure 2.

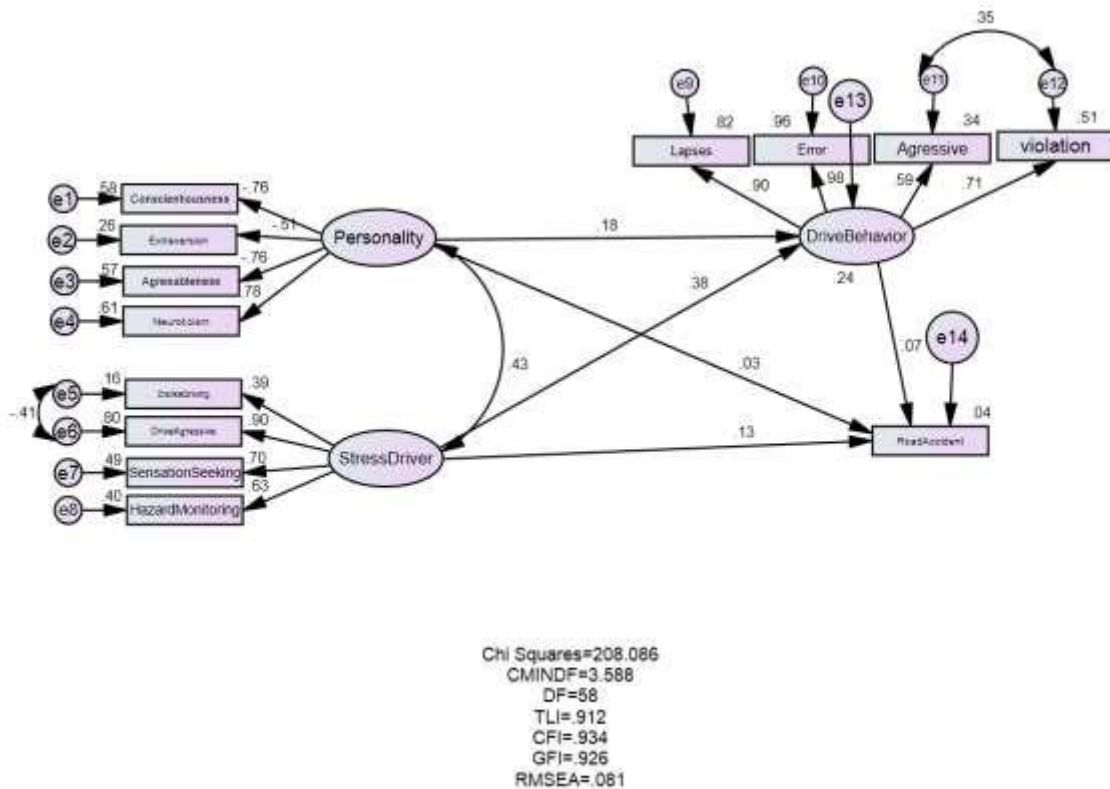


Figure 2: The Model Hypothesis of Personality and Driver Behavior on Road Accident Involvement on Bus Driver in Riau Province Indonesia

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