

AGGRESSIVE DRIVING BEHAVIOR – A REVIEW OF THE LITERATURE

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ABSTRACT

Most of the road accident happened in Malaysia involved young driver and motorcyclists. Aggressive behavior on the road has been highlighted as contributing factor of such event. This paper provides a review of current research on young driver behavior, focusing on factors that influence aggressive driving, given that this behavior has received the greatest attention in the young driver literature. The review discusses the concept of aggressive driving, factors influence such behavior and types of aggressive driving that being done by young drivers. In the final section of the paper, recommendations for future research are provided.

Keywords: *Road safety, Young driver, Road accident, aggressive driving*

INTRODUCTION

Since year 2006, road accidents in Malaysia had been increasing and most of the accidents ended with deaths, serious injuries and total loss vehicles. This has been a major problem for the Malaysian drivers especially for the motorcyclists by recording the highest number of road accidents in Malaysia. According to Bukit Aman Traffic Investigation and Enforcement Department (2016), the trend of motorcycle accidents has increased by 7.2 per cent from year 2012 to 2016. In detail, an estimated 12,554 motorcyclists were involved in accidents and 4485 people died in 2016. On the other hand, the number of car accidents continued to rise by another 8,000 cases, or 9.4 percent, from year 2012 to 2016. Overall,

there were 652,758 and 123,408 cases of car and motorcycle accidents were recorded in year 2016 respectively (Ministry of Transport Malaysia, 2016).

Based on above statistics, the Malaysian Institute of Road Safety Research (MIROS) discovered that more than 80% of road accidents in Malaysia are caused by human error. Previous studies have consistently discovered that majority road accidents are due to aggressive driving such as speeding, racing, tailgating, failing to observe signs and regulations, and seeking confrontations with other drivers (Fai, 2015; Plankermann, 2014).

Manan and Varhelyi (2012) found that young drivers aged 16–25 years have the highest number of road accidents in Malaysia, constituting 38.7 to 59.7 deaths per 100,000 populations. This can be supported by a study conducted by Al-Reesi, Ganguly, Al-Adawi, Lalamme, Hasselberg, Al-Maniri (2013) that examined responses to the Driving Behavior Questionnaire among young drivers in Oman and found that aggressive driving especially speeding very common and as main contributory factors in road accidents among young drivers. However, there are only little researches had been done to examined factors that contribute to road accidents among drivers in Malaysia. Therefore, the purpose of this paper is to provide a review of literature on (1) concept of aggressive driving among young drivers in Malaysia (2) factors that influence aggressive driving behavior among young drivers in Malaysia (3) types of aggressive driving among young drivers in Malaysia. Recommendations to minimize road accidents among young drivers in Malaysia are provided in the discussion section of this paper.

LITERATURE REVIEW

Young drivers in Malaysia

The minimum age in any given young driver range is commonly defined according to licensing restrictions in the relevant jurisdiction and typically extends to a maximum age of 25 years. Within Malaysia, the minimum age to apply for a motorcycle and car license is 17 years old (Road Transport Department (RTD) of Malaysia, 2008). Therefore, for the purpose of the current research, young drivers in Malaysia are categorized as drivers aged between 17 to 25 years old.

Concept of aggressive driving behavior

Aggressive driving has been the major contributor of road accidents as this has become a growing problem in Malaysia. King and Parker (2008) defined aggressive behavior as a response that delivers harmful stimuli with the purpose to give a danger or injury to other living who is encouraged to avoid such behavior. Generally, these definitions are referred to people.

The concept of aggressive behavior has the same characteristics with aggressive driving. In terms of driving, aggressive driving was defined as any form of behavior that is intended to injure or harm other road users physically or psychologically (Özkan & Lajunen, 2005). The National Highway Traffic Safety Administration (NHTSA) (2002) defined aggressive driving behavior as operating a vehicle with more aggressive that threatens road users or property. Nesbit, Conger, and Conger (2007) defined aggressive driving behavior as any undesirable, dangerous or risky action on the road, such as weaving through lanes, running red lights, tailgating, and using the shoulder to pass.

Even though this concept has been studied for years, but there are still ambiguities in determining the critical factors that influence some drivers to be aggressive on the road. Thus, this paper will discuss the factors that are associated with aggressive driving from the available literature.

Factors influencing aggressive driving

Anger

According to Berkowitz (1993), a person's aggression depends on the amount of anger that they express when confronting with frustrating situation. In terms of driving, the concept of driving anger was defined as the tendency to become angry behind the wheel (Deffenbacher, Oetting, & Lynch, 1994). According to Whelan, Scully and Newstead (2009), young drivers are potentially to get angry easily compared to old drivers especially when they were provoked or challenged by other drivers. For example, the drivers will express their driving anger when they face with several frustrating situations such as slow traffic, blocked traffic, being honked, or being tailgated by others. These angry drivers will impose their aggressiveness when driving towards others without paying any attention to others intentions and rights in road and results in a higher risk for accidents and a greater number of road accidents with fatalities. In addition, young male drivers are at a greater risk of involving in road accidents compared to older drivers (Laapotti, 2003). Deffenbacher, Oetting, and Lynch (1994) had developed the Driving Anger Scale (DAS), an instrument to measure driving anger. This instrument has been proved to be related to the frequency and intensity of angry thoughts and feelings as well as aggressive driving. Moreover, the relationship of driving anger and aggressive driving could predict aggressive driving outcomes such as road accidents and property damages. Table 1 summarizes the reviews of anger in influencing aggressive driving behavior.

Table 1
 Summary of reviews on anger

Authors	Findings
Berkowitz (1993)	a person's aggression depends on the amount of anger that they express when confronting with frustrating situation.
Deffenbacher, Oetting, & Lynch (1994)	the concept of driving anger was defined as the tendency to become angry behind the wheel
Whelan, Scully and Newstead (2009)	young drivers are potentially to get angry easily compared to old drivers especially when they were provoked or challenged by other drivers.
Laapotti (2003)	young male drivers are at a greater risk of involving in road accidents compared to older drivers

Big 5 Personality Traits

Besides the influence of anger on aggressive driving behavior, a driver's personality traits are discovered to have connection with aggressive driving behavior. Costa Jr. and McCrae (1992) defined personality traits as dimensions of individual differences that have a consistent pattern of thoughts, feelings, and behavior. In detail, there are five big personality traits (Big 5 traits) that related to young drivers such as neuroticism, extraversion, openness, agreeableness, and conscientiousness (Costa Jr. & McCrae, 1992).

Neuroticism is a personality trait that is defined as an inclination to experience negative emotions and difficulty in dealing with problems (Carver & Scheier, 1999). People with a high score on the neuroticism scale are often impatient, anxious, tense and irritated and tend to act aggressive when driving.

Meanwhile, extraversion is a personality trait that reflects social relations, the need for stimulation and the capacity to experience positive emotions (Lev, Hershkovitz, & Yechiam, 2008). People with a high score on the extraversion scale are active, talkative, optimistic, cheerful, enjoy excitement and stimulation, and are full of energy. Therefore, those who violated traffic regulations were much more extraverted than were those in a control group. Extraversion has also been shown to be connected with physical aggression toward other drivers that might cause road accidents (Benfield, Szlemko, & Bell, 2007).

On the other hand, openness towards an experience is defined as an active need for a novel experience and a tolerance of things that are unknown and novel (Fernandes, Job, & Hatfield, 2007). People who have the personality trait of openness are curious, non-traditional, unconventional, and prone to seek out novel experiences and reconsideration of authorities, although not necessarily unprincipled or lacking a system of values.

Next, agreeableness is a personality trait that reflects an individual's relationships with and attitudes about other people (Costa, McCrae, & Dembroski, 1989). Individuals with a high score on the agreeableness scale tend to be altruistic, empathetic and willing to help others, believing that they will receive same treatment from others in return. Antagonistic people tend to be hostile and irritating and have the need to confront, attack or punish others. Although this dimension can be connected with aggressive behavior in general, and with driving-related aggression specifically, based solely on its definition, there are few studies that have confirmed this relationship empirically.

Last but not least, conscientiousness is defined as the extent of a motivation behavior directed towards a goal (Benfield, Szlemko, & Bell, 2007). People with high scores on the conscientiousness scale are precise, punctual, reliable, scrupulous, and thoughtful and have strong feelings of order, duty and self-discipline. Such persons could be expected to observe traffic regulations and laws and to act thoughtfully in traffic.

In conclusion, based on the reviews, it is expected that all of these traits will influence drivers aggressive driving behavior on the road. Table 2 summarizes the reviews of personality traits on aggressive driving behavior.

Table 2
Summary of reviews on personality traits

Authors	Findings
Costa Jr. & McCrae (1992)	dimensions of individual differences that have a consistent pattern of thoughts, feelings, and behavior. five big personality traits (Big 5 traits) that related to aggressive driving such as neuroticism, extraversion, openness, agreeableness, and conscientiousness.
Carver & Scheier (1999)	Neuroticism is a personality trait that is defined as an inclination to experience negative emotions and difficulty in dealing with problems.
Lev, HersHKovitz, & Yechiam (2008)	Extraversion is a personality trait that reflects social relations, the need for stimulation and the capacity to experience positive emotions.
Benfield, Szlemko, & Bell (2007)	Extraversion has also been shown to be connected with physical aggression toward other drivers that might cause road accidents.
Fernandes, Job, & Hatfield (2007)	Openness towards an experience is defined as an active need for a novel experience and a tolerance of things that are unknown and novel
Costa, McCrae, & Dembroski (1989)	Agreeableness is a personality trait that reflects an individual's relationships with and attitudes about other people
Benfield, Szlemko, & Bell, (2007)	Conscientiousness is defined as the extent of a motivation behavior directed towards a goal

Sensation Seeking

Zuckerman (1990) defined sensation seeking as a personality trait involving the degree to which one desires novel and intense stimuli as it is another factor that has received considerable attention for its role in driving behavior. In another study, Zuckerman (1994)

had revealed the extended definition of sensation seeking which is seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experiences. As a result, those high in sensation seeking are assumed to engage in aggressive driving to provide the type of stimulation that they find pleasurable. High sensation seeking might have been related to some aggressive driving acts such as speeding, passing in no-passing zones, and a variety of other unsafe driving behaviors (Jonah, Thiessen, & Au-Yeung, 2001). Table 3 summarizes the reviews of sensation seeking towards aggressive driving behavior.

Table 3
Summary of reviews on sensation seeking

Authors	Findings
Zuckerman (1990)	personality trait involving the degree to which one desires novel and intense stimuli as it is another factor that has received considerable attention for its role in driving behavior.
Zuckerman (1994)	seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experiences.
Jonah, Thiessen, & Au-Yeung (2001)	High sensation seeking might have been related to some aggressive driving acts such as speeding, passing in no-passing zones, and a variety of other unsafe driving behaviors.

Macho Personality

The concept of macho personality has been proposed by Mosher and Sirkin (1984) to refer to an exaggerated endorsement of the male stereotype acquired in early and middle childhood. During this developmental period, it is vital to foster an exaggerated masculine style in order to eliminate the emotions of fear and distress among boys (Mosher & Sirkin, 1984). Parry (1968) found that young men drivers aged 16 to 25 years scored significantly higher on a measure of driving aggression. Thus, it is important to study men's aggressiveness on the road. Obviously, there are individual differences in the extent to which men identify with the traditional male stereotype such as macho personality. The macho personality consists of three components such as (1) calloused sexual attitudes toward women, (2) the perception of violence as manly, and (3) the view of danger as exciting. In addition, a masculine driving style is likely to be reflected in the choice of a high-powered car, which enables fast and furious driving (Krahé & Fenske, 2002). Nowadays, a wide range of high-powered models is available, even among smaller and less expensive cars, so driving a powerful car is to some degree a matter of choice, not just of financial resources. Therefore, macho personality could be one of the factors that influence young drivers' to be aggressive on the road. Table 4 summarizes the reviews of macho personality in influencing aggressive driving behavior.

Table 4
Summary of reviews on macho personality

Authors	Findings
Mosher and Sirkin (1984)	an exaggerated endorsement of the male stereotype acquired in early and middle childhood. During this developmental period, it is vital to foster an exaggerated masculine style in order to eliminate the emotions of fear and distress among boys.
Parry (1968)	young men drivers aged 16 to 25 years scored significantly higher on a measure of driving aggression. Thus, it is important to study men's aggressiveness on the road.
Krahé & Fenske (2002)	a masculine driving style is likely to be reflected in the choice of a high-powered car, which enables fast and furious driving

Types of aggressive driving

Speeding

Speeding is the most common driving offence and contributed in many crashes among young drivers. Speeding is defined as a driver was offending the speed limit, exceeding or driving too fast for conditions contributed to the crash (NTSHA,2002). Based on NHTSA (2002) data showed that 39 percent of male driver age between 15 and 20 were involved in fatal crashes while speeding at the time of crash. They always drive at high speed lead to lose control over the vehicles. On top of that, speeding is the third contributor to traffic accidents.

Researchers have indicated that speeding is a very dangerous driving behavior and should be considered one of the most important contributors to specific kinds of accidents such as right of way violations, active shunts or reversing, and loss of control (West & Hall, 1997). According to statistic compiled by Bukit Aman Traffic Investigation and Enforcement Department in 2016, 30.6% of drivers involved in fatal accidents because of driving too fast. In particular, Fai (2015) and Plankermann (2014) discovered that majority of young male drivers were involved in excessive speeding behaviors because of running late, not paying attention to the speed, keeping up with the flow of traffic, and enjoying the thrill of driving fast.

Red-Light Running (RLR)

Red-light running (RLR) is one of the most aggressive driving behaviors and occurs frequently in urban areas. Based on RTD of Malaysia (2008), RLR was defined in two ways. The first one was under a “permissive yellow” rule that a driver could legally enter the intersection during the entire yellow interval. In this case, RLR refers to a violation when a driver entered an intersection after the onset of a red light. The other rule was “restrictive yellow” that a driver could neither enter nor be in the intersection on a red light. Under this situation, RLR refers to a violation when a driver had not cleared intersection after the onset of a red light. RLR has become a serious threat, so

much so that about 40% of the 123,408 accidents occurring in Malaysia were estimated to be intersection-related and 5.2% of the drivers involved in the fatal crashes in 2016 failed to obey traffic signs, or signals (RTD of Malaysia, 2008). Researchers have conducted many studies to investigate RLR behavior. For example, Retting and Williams (1996) found that the red-light runners were always young drivers aged below 25 years old.

Furthermore, Retting, Ulmer, and Williams (1999) indicated that red-light runners were more likely to be young males with invalid driver's licenses and had alcohol consumptions; in particular, those who were deviant and driving after drinking were more likely to run red-light at night. In a later study, Porter and England (2000) argued that RLR rates were related to the size of the intersection, traffic volume, time of day, safety belt use, and ethnicity. Also, Porter and Berry (2001) demonstrated that violators were more likely to drive alone and in a hurry. They also found that a driver's characteristics, attitudes, and the presence of passengers were important predictors of RLR behavior. Recently, Elmitiny, Yan, Radwan, Russo, & Nashar (2010) also showed that moving speed, vehicle's distance from the intersection, and positions in the traffic flow were significantly associated with RLR.

DISCUSSION

This paper discusses the utility of the Driving Anger Scale (DAS) in predicting aggressive driving. In deep, one's propensity to experience angry feelings while driving predicted lapses in concentration while driving such as not complying to speed limit and red light. In addition, DAS also can be used to measure aggressive driving for instance, minor loses of vehicular control, close calls, aggressive driving, risky driving, physically aggressive driving anger expression, verbally aggressive driving anger expression, and use of the vehicle to express anger. Besides that, sensation seeking also can predict the same act of aggressive driving with DAS as high sensation seekers may perceive less risk is high-risk driving situations or may be more willing to accept the risk in order to experience the thrill associated with risky behavior.

Next, this article combines four separate literatures of personality attributes on the prediction of aggressive driving, for instance driving anger, the Big 5 traits, sensation seeking, and macho personality. From the Big 5 traits, agreeableness is the most influential predictor to aggressive driving as low levels of agreeableness predicting high levels of aggression such as speeding and Red Light Running. In addition, it is known that young people are tend to have less driving experience that will lead to low agreeableness while driving and more prone to accidents and receive more fines than people from other age groups. On the other hand, extraversion has been predicted to have positive relationship with aggressive driving. For instance, individuals characterized by high extraversion are prone to behave aggressively when driving, increasing the risk that they will be involved in accidents, frequently receive summons or have their licenses suspended. In busy traffic, conditions and situations that induce stress are generated. Due to low tolerance to stress, people with high

extraversion choose to behave aggressively. Of the Big 5 traits, conscientiousness also could be a predictor of aggressive driving as individuals characterized by low conscientiousness manifested increased aggression when driving. These people generally do not follow the rules and are characterized by an erratic lifestyle which transposes into their driving behavior. When driving, these people are rebellious and disorganized, and have an aggressive driving style, which often leads to the occurrence of accidents or violations of traffic rules. Meanwhile, neuroticism and openness will be not predicting aggressive behavior among young drivers.

Lastly, this paper explains in detail macho personality in predicting aggressive driving. Macho personality is more related to young and male drivers. Drivers endorsing a macho personality is predicted to have experienced aggressive driving. In addition, it can be expected that macho men emphasize on speeding, whereas non-macho men are guided to a greater extent by safety considerations in their driving styles. On top of that, macho personality could capture an aspect of male gender identity that is relevant to the prediction of aggressive driving behavior.

CONCLUSION

As a conclusion, this paper provides an extensive knowledge on critical factors that influenced the driving behavior of young drivers in Malaysia. In sum, there are five critical factors that can influence a driver to be aggressive while driving such as anger, individual personality traits, seek for sensation, and macho personality. Besides that, this paper also contributes to develop a theoretical framework that integrates the factors influencing aggressive driving and types of aggressive driving behavior which make it necessary to give a further explanation on aggressive driving behavior among young drivers in Malaysia. It is suggested that this study would benefit to increase the awareness of road safety among Malaysian drivers especially the younger generation.

REFERENCES

- Al-Reesi, H., Ganguly, S.S., Al-Adawi, S., Laflamme, L., Hasselberg, M., Al-Maniri, A., (2012). Economic growth, motorization and road traffic injuries in the Sultanate of Oman, *Traffic Injury Prevention*. <http://dx.doi.org/10.1080/15389588.2012.694088>.
- Benfield, J. A., Szlemko, W. J., & Bell, P. A. (2007). Driver personality and anthropomorphic attributions of vehicle personality relate to reported aggressive driving tendencies. *Personality and Individual Differences*, 42, 247–258.
- Berkowitz, L. (1993). Aggression: Its Causes, Consequences, and Control. *Aggressive Behavior*, 20(6), 464–466.
- Bukit Aman Traffic Investigation and Enforcement Department. (2016). *Statistics of road accidents for motorcycle vehicles in Malaysia*. Polis DiRaja Malaysia.

- Carsten O.M.J., Tight M.R., & Southwell, M. T. (1989). *Urban accidents: Why do they happen?* Basingstoke, UK: AA Foundation for Road Safety Research.
- Costa Jr. P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO-PI-R) and NEO five factor inventory (NEO-FF-I) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., McCrae, R. R., & Dombroski, T. M. (1989). *Agreeableness versus antagonism: Explication of a potential risk factor for CHD*. In A. W. Siegman & T. M. Dombroski (Eds.), *In search of coronary prone behavior* (pp. 41–63). Hillsdale, NJ: Erlbaum.
- Deffenbacher, J. L., Oetting, E. R., & Lynch, R. S. (1994). Development of a driving anger scale. *Psychological Reports, 74*, 83–91.
- Elmitiny, N., Yan, X., Radwan, E., Russo, C., & Nashar, D. (2010). Classification analysis of driver's stop/go decision and red-light running violation. *Accident Analysis and Prevention, 42*, 101–111.
- Fai, L. C. (2015, May 25). Miros statistics say human error causes 80% of traffic accidents. *theSun Daily*. Retrieved from <http://www.thesundaily.my/news/1333889>.
- Fernandes, R., Job, S. R. F., & Hatfield, J. (2007). A challenge to the assumed generalisability of prediction and countermeasure for risky driving: Different factors predict different risky driving behaviors. *Journal of Safety Research, 38*, 59–70.
- Jonah, B. A., Thiessen, R., & Au-Yeung, E. (2001). Sensation seeking, risky driving, and behavioral adaptation. *Accident Analysis and Prevention, 33*, 679–684.
- King, Y., & Parker, D. (2008). Driving violations, aggression and perceived consensus. *Revue Europeenne De Psychologie Appliquée 58*, 43–49.
- Krahé, B., & Fenske, I. (2002). Predicting aggressive driving behavior: The role of macho personality, age, and power of car. *Aggressive Behavior, 28*, 21–29.
- Laapotti, S. (2003). *What Are Young Female Drivers Made of? Differences in Attitudes, Exposure, Offences and Accidents Between Young Female and Male Drivers*. Turku, Finland: University of Turku.
- Lev, D., Hershkovitz, E., & Yechiam, E. (2008). Decision making and personality in traffic offenders: A study of Israeli drivers. *Accident Analysis and Prevention, 40*, 223–230.
- Manan, M. M. A., & Várhelyi, A. (2012). Motorcycle fatalities in Malaysia. *IATSS Research, 36* (1), 30–39. <http://dx.doi.org/10.1016/j.iatssr.2012.02.005>.
- Ministry of Transport Malaysia. (2016). *Transport Statistic Malaysia*.
- Mosher, D. L., & Sirkin, M. (1984). Measuring a macho personality constellation. *Journal of Research in Personality, 18*, 150–163.
- National Highway Traffic Safety Administration (NHTSA). 2012. "Aggressive driving."
Available: <http://www.nhtsa.gov/Aggressive>.
- Nesbit S. M., Conger, J. C., & Conger, A. J. (2007). A quantitative review of the relationship between anger and aggressive driving. *Aggression and Violent Behavior, 12*, 156–176.
- Özkan, T., & Lajunen, T. (2005). Why are there sex differences in risky driving? The relationship between sex and gender-role on aggressive driving, traffic offences,

- and accident involvement among young Turkish drivers. *Aggressive Behavior*, 31, 547–558.
- Parry, M. H. (1968). *Aggression on the road*. London: Tavistock.
- Plankermann, K. (2014). *Human factors as causes for road traffic accidents in the Sultanate of Oman under consideration of road construction designs*. PhD Thesis. University of Regensburg.
- Porter B. E., & England, K. J., (2000). Predicting Red-Light Running Behavior: A Traffic Safety Study in Three Urban Settings. *Journal of Safety Research*, 31 (1), 1–8.
- Porter E. Bryan and Berry D. Thomas. (2001). A nationwide survey of self-reported red light running: Measuring prevalence, predictors, and perceived consequences. *Accident Analysis and Prevention*, 33, 735–741.
- Retting, R. A., Ulmer, R. G., & Williams, A.F. (1999). Prevalence and characteristics of red light running crashes in the United States. *Accident Analysis and Prevention*, 31, 687–694.
- Retting, R.A., & Williams, A.F. (1996). Characteristics of red light violators: Results of a field investigation. *Journal of Safety Research*, 27, 9–15.
- Road Transportation Department of Malaysia (2008). *Transport Statistic Malaysia*.
- West, R., Hall, J. (1997). The role of personality and attitudes in traffic accident risk. *Applied Psychology: An International Review*, 46 (3), 253–264.
- Whelan, M., Scully, J., & Newstead, S. (2009). *Vehicle safety and young drivers Stages 2 and 3: Analysis of young driver crash types and vehicle choice optimization*. Report 292. MUARC.
- Zuckerman, M. (1994). Behavioral expressions and biosocial bases of sensation seeking. Cambridge: University of Cambridge Press.
- Zuckerman, M., (1990). The psychophysiology of sensation seeking. *Journal of Personality*, 58, 313–345.