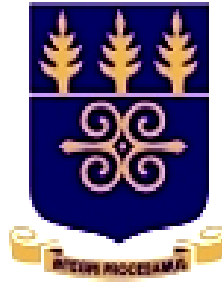


**UNIVERSITY OF GHANA
DEPARTMENT OF PSYCHOLOGY**



**TRAFFIC RISK PERCEPTION, RISK TOLERANCE AND DRIVING
BEHAVIOURS IN GHANA: A CASE STUDY AMONG COMMERCIAL DRIVERS
IN THE GREATER ACCRA REGION**

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
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DECLARATION

I, Priscilla Kafui Akoto, the author of this thesis do hereby declare that except for references to other people’s works, which I have duly acknowledged, the study herein presented is the first of its kind to be carried out in the Department of Psychology, University of Ghana, Legon, during the 2016/2017 academic year under the objective supervision of Dr. Adote Anum and Dr. Benjamin Amponsah. This work has never been submitted in any form, whole, or part for a degree in this university or elsewhere.

Signed

Priscilla Kafui Akoto

Date

(Student)

This work has been submitted for examination with our approval as supervisors

Signed.....

Dr. Adote Anum

Date

(Principal Supervisor)

Signed.....

Dr. Benjamin Amponsah

Date

(Co-supervisor)

DEDICATION

This work is dedicated to all victims of road traffic accidents especially, to those who suffered various consequences of road accidents through the recklessness and negligence of drivers. It is also dedicated to the numerous individuals, groups and organizations that have road safety at heart.

A special dedication goes to RT. Rev. Prof. Cephas Narh Omenyo, my god father for his sacrifices and dedication that saw the successful completion of this work as well as the victory in my education.



ACKNOWLEDGEMENT

First of all, I acknowledge God who made my work a reality, secondly to my family and again I cannot forget my dedicated and trustworthy supervisors of this project, Dr. Adote Anum and Dr. Benjamin Amponsah. They have contributed greatly to the success of this work. Their ideas, insight and tolerance were enough to raise my enthusiasm for this work. I finally appreciate and acknowledge all those who in one way or the other have contributed to the success of this project.



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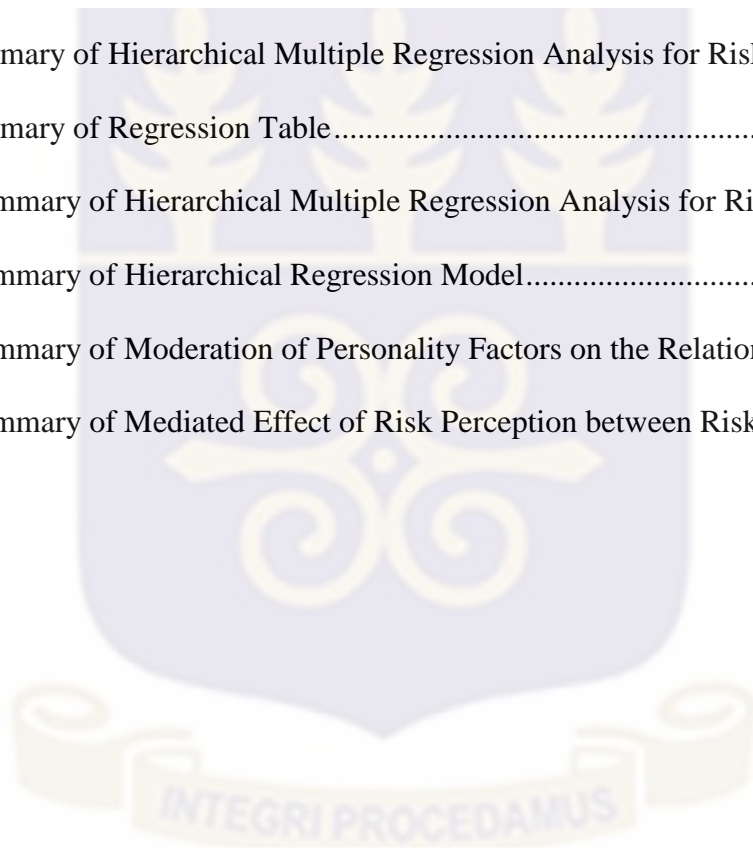
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ABSTRACT

The current study examine the effect of risk tolerance and different components of risk perceptions influence in driving behaviour. A sample of 151 driver was conveniently sampled in Accra, Ghana for the study. The tests that were used for the study included the risk perception scale, hypothetical risk tolerance scale, the five factor inventory and the driver behaviour questionnaire. Factor analysis was used to test for the construct validity of the items within the Ghanaian context and the hypothesis were tested using series of hierarchical multiple regressions. Findings from a series of multiple regression analysis showed the risk tolerance was found to increase overall risky driving behaviours and three components of risk driving behaviours, aggressive violations, ordinary violations and errors but not lapses. Risk perceptions positively predicted driving behaviours. When the two components of risk perceptions where analysed, it was observed that only effective components of risk perception positively predicted driving behaviours. Neuroticism moderated the relationship between risk perception and driving behaviours. The findings are discussed within the context of promoting safety driving among commercial drivers in Ghana.

Keywords: Risk Perception, Risk Tolerance, Personality Factors, Driving Behaviours, Ghana

CHAPTER ONE

INTRODUCTION

Background to the Study

In Ghana, road traffic accidents are the most rampant form of occupational accidents which claim more lives and destroy more properties than any form of severe occupational accidents (National Road Safety Commission, 2013). The number of road accidents is increasing leading to loss of lives, injuries and destruction of properties (World Health Organisation, 2013). Statistics available at National Road Safety Commission (NRSC, 2008) for instance show that between 1991 and 2008, there had been 237,289 casualties which are due to road traffic accidents that claimed 25,585 lives, caused 84,934 serious and 126,782 minor injuries. The World Health Organisation (WHO) in 2008 described road traffic accidents in developing countries as ‘hidden epidemic’ and even projected it to be the fifth leading cause of death in developing countries by 2030.

This situation is very worrying especially looking at the high rates of fatalities that are associated with road traffic accidents. For instance, in many African countries including Ghana, 70% of all road traffic accidents end in fatalities (WHO, 2009). In situations where lives are lost, the cost is not only limited to the amount spent on salvaging the situation but also the lost labour of those who lose their lives (Danso, 2010). Several factors have been implicated in the rampant road accidents. The factors include faulty vehicles, poor road networks and human errors on the part of the drivers. But of all these, human errors have been found to be the highest contributing factor. For instance, errors on the part of the drivers have been reported to contribute to about 90-95% of all road accidents (Rumar, 1985).

A number of factors have been identified to influence driver errors. Research in accident and safety has shown that risk perception is found to have a significant influence on human errors in accident. Risk perception is explained to be individuals' subjective evaluation of the likelihood or probability and severity of the amount of hazards inherent in a current or impending activity (Iverson & Rundmo, 2002). When individuals perceive high risk in an activity, they are more likely to engage in safe or protective behaviours. The current study empirically examined how risk perception and risk tolerance influence driving behaviours among commercial drivers in Accra, the capital city of Ghana.

Risk Perception and Risk Tolerance

Risk perception is considered as the lens through which individuals view, evaluate or make judgement of the likelihood of a risk or harm occurring and the seriousness of the consequences (Oppong, 2015). Therefore, in occupational health and safety management, risk perception is considered to have two components which are probability of the risk occurring and the severity of its consequences (Gyekye, Salminen & Ojajarvi, 2012). Risk perception is found to be a component of a broader risk evaluation or judgment which is also influenced by risk tolerance. Risk tolerance involves the amount of risk that individuals deem acceptable to bear in a given situation (Ulleberg & Rundmo, 2003). Thus, there are different levels of risk in different occupational contexts. The amount of acceptable risks inherent in an occupation or an activity (risk tolerance) influence individuals risk perception. Therefore, there is an inverse relationship between risk tolerance and risk perception.

Risk tolerance is found to be shaped by micro individual level and broader or macro level situations such as type of occupation and the broader policies and rules regarding occupational health and safety climate (O'Toole, 2002). Because of that, risk tolerance is influenced by safety climate in an occupational context and individual level

characteristic such as the amount of risk a person can entertain. Risk perception on the other hand is strictly a micro or individual level subjective interpretations of an event. The fact that risk perceptions are shaped by attitudes, which involves both cognitive and emotional processes (Oppong, 2015) makes risk perception a dispositional construct which is better assessed through personality factors. Personality factors have therefore been reported to influence both risk perception and driving behaviours. Personality is defined as individual differences in terms of characteristic patterns of thinking, feeling and behaving (Allport, 1961). Some scholars (e.g., Ulleberg & Rundmo, 2003) argue that individual differences in terms of personality traits account for differences in people's level of perceived risks and their associated behaviours, especially among drivers.

Risky Driving Behaviours among Commercial Drivers

Driving behaviours are defined as the actions and decisions that drivers engage in while travelling on the road. Driving behaviours are broadly categorized into risky driving and safety driving (Sucha, Sramkova & Risser, 2014). Safety driving is defined as the actions and decisions that drivers take which protect themselves and other road users from the risk of road accident (Machin & Sankey, 2008). Risky driving behaviours are defined as decisions and actions taken by drivers that put themselves and other road users in danger (Machin & Sankey, 2008; Sucha et al., 2014).

In the current study, driving behaviour was conceptualized using risky driving behaviours to measure decisions and actions taken by drivers that put themselves and other road users in danger of road accident. Driver in the current study was also conceptualized as commercial drivers. The National Road Safety Commission (2013) defines commercial drivers in Ghana as the category of drivers who are engaged in the business of transporting the travelling public to and from their destinations.

Four domains of risky driving behaviours were assessed in the current study; aggressive violations, errors, ordinary violations and lapses. Aggressive violations assessed the dangerous violations of road safety violations usually in response to provocations from other road users (Sucha et al., 2014). The errors dimension assessed dangerous mistakes commercial drivers make that put other road users in danger. Ordinary violations assessed the actions and decisions that violate road safety regulations in ways that do not necessarily put self and others in danger. The final dimension which is lapses assessed the normal forgetfulness that characterizes driving behaviours.

In terms of road safety in Ghana, errors on the part of drivers can therefore be accounted for by risk tolerance in road safety in Ghana and risk perceptions on the part of the individual drivers. There are motor traffic laws and rules and regulations in Ghana that guide behaviours of road users in general and drivers in particular. These rules and regulation specify acceptable and unacceptable behaviours for drivers and therefore shape risk tolerance. Even though the rules and regulations serve as a guide to drivers, the rules do not make decisions for the drivers. The drivers make their own decisions based on their subjective evaluations of the daily situations they meet on the road. The choice of drivers is due to the fact that most traffic accidents are found to be as a result of driver errors (Lajunen et al., 2004), which usually manifests in their inaccurate evaluation or judgement of an impending danger (Iverson & Rundmo, 2002) being a result of their own actions or actions of other road users (Ulleberg & Rundmo, 2003).

Statement of the Problem

Driving is a risky and stressful activity that is filled with quick and on the spot decisions on the part of the drivers. In emergency situations, drivers have less time to think about the best decision to take. Most road accidents therefore happen as a result of impromptu decisions drivers make which tends to be wrong (Machin & Sankey, 2008;

Sucha et al., 2014). Research shows that several situations that require drivers to make such quick decisions are situations that could have been avoided if drivers accurately perceive the probability of the inherent danger (Iverson & Rundmo, 2002). This therefore requires a critical understanding of risk perception among drivers to be able to understand their decision-making process when driving. However, the literature on risk perception among drivers and driving behaviours so far does not provide a holistic understanding of how risk perception influence driving behaviours. The literature globally by far has explored only one component of risk perception (cognitive risk perception) to the neglect of the affective component of risk perception which is also an important aspect of subjective evaluation of incidents on the road. In Ghana for instance, research on risk perception among drivers is scarce. Majority of the studies in Ghana explore main socio-demographic factors like gender, age, years of experience and educational experience in explaining risky driving behaviours.

This creates a deficit in two domains in road safety in Ghana; in the areas of training drivers in driving schools and testing or examining drivers for the award of driving license (Akateeba et al., 2015). Most of the curricular in driving training school focus on the skills of moving a vehicle with little or no attention given to the risk evaluation and perception whiles driving. This has accounted for the reason why drivers who receive their training in a driving school report high traffic violations compared to those who receive their training from informal sources (Akaateba et al., 2015). It is therefore imperative to further empirically examine risk perception and driving behaviours in order to get a deeper understanding of risk perception, especially in Ghana where literature is scarce.

Aim and Objectives

The main aim of the current study was to empirically examine how risk perception and risk tolerance influence driving behaviours in Ghana. Specific objectives of the study are;

1. To examine the effect of risk tolerance on risky driving behaviours among commercial drivers in Accra.
2. To assess the effect of risk perception on risky driving behaviours among the commercial drivers in Accra.
3. To assess the moderating role of personality factors on the relationship between risk perception and risky driving behaviours.
4. To examine the mediating effect of risk perception on the relationship between risk tolerance and risky driving behaviours.

Research Questions

Based on the specific objectives of the study, the following research questions are raised:

1. What is the effect of risk tolerance on risky driving behaviours among commercial drivers in Accra?
2. What is the effect of risk perception on risky driving behaviours among the commercial drivers in Accra?
3. Do personality factors moderate the relationship between risk perception and risky driving behaviours?
4. Does risk perception mediate the relationship between risk tolerance and risky driving behaviours?

Significance of the Study

The study makes important contributions to road safety issues in Ghana in different ways. For instance, in terms of training drivers in Ghana, findings for the study provides insight into how different components of traffic risk perception influence driving behaviours and the other factors that moderate the relationship. This helps in improving and broadening the curriculum for training drivers to include cognitive and affective processing of traffic incidents in order to pre-empt risk situations and avoid it. With regards to testing drivers, findings from the study also inform the cognitive test that is organised by the Driver and Vehicular Licensing Authority (DVLA) in ways that can help in holistic assessment of risk of individual would-be drivers applying for license.

The findings from the study also provide insight into how personality factors influence risk perception of commercial drivers. This will improve the training and licensing of commercial drivers in Ghana. The findings also give insight into planning road safety campaigns in Ghana by factoring the element of personality differences in the development on the campaign messages. Apart from its contribution to road safety in Ghana, the study also makes contribution to the development of road safety literature in Ghana. Findings from the study provide understanding of how drivers' judgement and decision making process on the road are influenced by their personality characteristics. This helps advance the literature on road safety in Ghana by paying attention to the subjective predictors of risk perception of workers.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter of the study consists of sections on theoretical frameworks, review of related studies, rationale for the study, key variables of the study, statement of hypotheses and operational definitions.

Theoretical Framework

The theories that are used as the frameworks to explain the study are the Risk Preference theory and the Protection Motivation Theory.

Protection Motivation Theory

The Protection Motivation Theory (PMT) was originally developed by Rogers (1975) to conceptually provide clarity to the understanding of how fear appeals evoke protective behavioural responses. The PMT was originally developed within fear-arousing communication framework. The PMT took the affective route to explaining communication and attitude change. In later revisions of the PMT, Rogers (1983) extended the theory to encompass all general theory of persuasive communication, placing emphasis on the role of how cognitive processes mediate fear-appeal messages in behavioural change communications (Boer & Seydel, 1996; Norman, Boer & Seydel, 2005).

The central propositions of the PMT is that when individuals perceive fear or danger in activities they usually engage in, they are motivated to protect themselves by engaging in protective behaviours (Normal et al., 2005). Over the years, the Protective Motivation Theory has been used to explain persuasive communication and driving behaviours. This is mainly because the PMT is considered as one of the most suitable

theories for explaining driving behaviours based on how drivers perceive and tolerate risk (Nordfjaern, Jorgensen & Rundmo, 2011).

By extending the central assumption of the PMT to driving behaviours, the PMT proposes that drivers are more likely to protect themselves when they anticipate negative consequences, have the desire to avoid them and feel they have the ability to take preventive measures (Khazode, Mati & Ray, 2012). The PMT basically rests on about six pillars which are severity, vulnerability, response-efficacy, self-efficacy, protection motivation and protective behaviours (Boer & Seydel, 1996). These pillars or components of the PMT are applied to explain driving behaviours.

The severity component looks at drivers' evaluations of the severity of the consequences of their actions should they be involved in an accident. The vulnerability component looks at drivers' evaluation of the probability of being involved of being involved in an accident. The response efficacy component looks at the drivers' evaluations of the ability of the prescribed road safety behaviours in averting the negative consequences. The self-efficacy component looks at the extent to which the drivers believe in their ability to engage in the prescribed road safety behaviours. The protection motivation component is the drivers' evaluations of their intention of engaging in the recommended driving behaviours and the protective behaviour component looks at the drivers actually engaging in safe driving behaviours.

Based on the six components, it can be deduced that the PMT conceptualises safety or risky driving to be evaluative and therefore a product of an individual's subjective cognitive and affective judgment because of the element of anticipation in the assumptions (Boer & Seydel, 1996; Khazode et al., 2012; Nordfjaern et al., 2011; Norman et al., 2005). According to protection motivation theory, risk perception and use of personal protective equipment increase when workers have reason for concern, often times due to a previous

incident. Protection motivation theory has been used to focus safety campaigns and has been shown to be more effective than other theories and models at decreasing young adults' intentions to speed while driving (Glendon & Walker, 2013).

Overall, PMT postulates that there is a relationship between risk perception and injuries and incidents, and that people take protective action when they are motivated and have the agency to do so. For example, Sheeran et al. (2013) found that enhancing the elements of risk appraisal (such as risk perception and perceived severity) has a combined positive effect on changing intentions and behaviour toward safety. This appraisal system (risk perception and perceived severity) is a product of individual characteristics including personality traits. The PMT has seen several criticisms on its conceptualization of the mechanisms involved in engaging in protective behaviours. First, the theory has been criticized for assuming linearity in the mechanisms leading to protective behaviours. By delineating the six components, the PMT is criticized for proposing that protective behaviours go through these stages and therefore discounting the possibility of impromptu or unplanned responses (Sheeran et al., 2013). Secondly, the PMT is criticized for conceptualising protective behaviours as being totally in the hands of the agentic rational individual who has all the power to either engage or avoid protective behaviours. In this way, the PMT discount other equally important contextual and structural factors that affect safety behaviours but exist outside the rational agentic self (Glendon & Walker, 2013).

These criticisms notwithstanding, the PMT is argued to be a suitable theory in explaining individual differences in risk perception and tolerance influence driving behaviours. Therefore, in applying PMT to this study, drivers have motivation to protect themselves against harmful situations or accidents. This motivation to protect themselves against injury depends on their affective and cognitive risk appraisal involving risk perception which itself depends on their perceived severity, vulnerability, response-

efficacy, self-efficacy, protection motivation and protective behaviours (Boer & Seydel, 1996). An element of perception in the risk appraisal means that drivers' motivation to protect themselves is influenced by their individual differences inherent in their dispositions towards risks.

Risk Preference Theory

The theory of risk preference was first developed by Weiner (1972) within the context of motivation for self-preservation to propose that individuals' motivation to protect themselves depends on their attitudes and predisposition towards risks. According to the Risk Preference theory, people have a natural predisposition towards risk. Thus, the risk preference theory broadly conceptualizes as the attitude people hold towards risks which influence their decision making behaviours. In other words, the level of risk individuals can tolerate shape their preferences for risk-inherent activities and whether or not they engage in risky behaviours.

Personality factors are therefore considered as an important predisposition in explaining risk perception according to this theory. Risk Preference theory also proposes that people act often in accordance with their preferences (Escher, 2010) which are usually shaped by personality differences (Roth & Kroll, 2007). Based on the internal disposition assumption of risk perception, three categories of workers can be identified: risk-seeking, risk-neutral, and risk-averse. Risk seeking individuals are conceptualised as those who are able to tolerate higher risks and therefore fancy taking risks. Risk neutral are individuals who have moderate or normal tolerance for risk and therefore do not engage in risks more than what is normal for daily activities. The risk averse individuals are those who have very low tolerance for risk and therefore avoid anything that has element of risks in them (Escher, 2010; Roth & Kroll, 2007).

Over the years, the risk preference theory has seen several revisions and applications in different fields of applied psychology such as health behaviours and driving behaviours. In its applications in different fields of applied psychology, the risk preference theory has seen a number of criticisms. Major among them is its fixation on individual-level explanations of behaviour that does not take into consideration meso-level and macro-level factors that impinge on behaviours. Sheeran et al. (2013) for instance have argued that high risk appraisal have minimal effect on behaviours and that there are several factors that are unaccounted for in risk-behaviour chain. Nonetheless, several researchers (e.g., Gwyther & Holland, 2012; Oltedal & Rundmo, 2006) have therefore applied risk preference theory to study driving behaviours. In the context of driving behaviours, risk preference theory conceptualises accident-proneness among drivers based on the level of risks they can tolerate. Thus, risk seeking drivers are conceptualised as being likely to engage in risky driving behaviours and risk averse drivers being least likely to engage in risky driving behaviours (Akaateba et al., 2015; Cobey et al., 2013; Gwyther & Holland, 2012; Opong, 2015).

In applying the Risk Preference theory to this study, the theory proposes that, risk perception among drivers would be influenced by their inherent dispositions that orient their evaluation and judgement of situation as risk or not risky. Therefore, risk perception and risk tolerance of drivers in this study is predicted to affect their driving behaviours and the effect moderated by differences in their personality characteristics.

Review of Related Studies

Majority of research studies examining risk perception and driving behaviours have shown that different levels of risk perception significantly influence both safe and risky driving behaviours (e.g., Chen, Donmez, Hoekstra-Atwood & Marulanda, 2016; Machado-Leon, Ona, Ona, Eboli & Mazulla, 2016; Sheeran, Harris & Epton, 2013;

Simsekoglu, Nordfjaern, Zavareh, Hezaveh, Mamdoohi & Rundmo, 2013). Several socio-demographic have also been found to influence both risk perception and risky driving behaviours among drivers (e.g., Akaateba et al., 2015; Cobey et al., 2013; Gwyther & Holland, 2012; Herrero-Fernandez, Macia-Guerrero, Silvano-Chaparro, Merino & Jenchura, 2016; Oltedal & Rundmo, 2006). The big 5 personality traits have also been purported to have an influence on risky driving behaviours in general (John, Naumann & Soto, 2008; Kumar & Singh, 2015; Thorrisen, 2013). The review is organised around these three themes in the literature.

Risk Perception, Risk Tolerance and Driving Behaviours

There is ample evidence to show that risk perception significantly influences driving behaviours. For example, in a study to examine the influence of drivers' perception of crash risk on their driving behaviours in a sample of 492 drivers in Spain, Machado-Leon et al. (2016) reported that crash risk perception significantly predicted risky driving behaviours. They explain that the crash risk perception of drivers is very important, especially in inter-city two-way lanes where a mistake on the part of the driver that lead to a crash can affect both on-coming vehicles and vehicles following the driver.

Risk perception is however a complex phenomenon that can be specific in a particular domain (e.g. crash risk perception) or general such other non-traffic risk perception. The Machado et al. (2016) study however does not give any indication of how crash risk perception relates to general risk perception. So it becomes difficult to identify whether the effect observed was as a results of drivers' risk perception in general.

Simsekoglu et al. (2013) have explored this issue in an earlier study between a sample of 213 Turkish and 254 Iranian drivers. They examined the influence of traffic and non-traffic risk perception on fatalism and driver behaviours. In both samples, they observed that traffic risk perception was positively correlated with non-traffic risk perceptions.

Drivers who reported high non-traffic risk perceptions also reported high traffic risk perceptions. But when it came to how perceived risk influenced driving behaviours, there were some nuances. For example, they observed that traffic risk was only associated with precautionary driving behaviours but not fatalism. Thus, high perceived risk significantly influenced safe driving behaviours such as wearing of seat belt and reduced speed limit. This was however observed in Turkish drivers but not in Iranian drivers. They observed among the Iranian drivers that perceived risk did not influence any of their driving behaviours (Simsekoglu et al., 2013).

Simsekoglu et al. (2013) explained that the observed differences between Turkish and Iranian drivers could be as a result of differences in cultural and socio-political environments of the safety constructs between these two countries. Turkish drivers were found to report greater mean scores on both traffic and non-traffic risk perceptions compared to Iranian drivers. Turkish drivers were also found to report lower mean score in traffic violations compared to Iranian drivers. Perhaps, Iranian drivers are able to tolerate high amount of risk compared to the Turkish driver. This is because risk perception has been found to be a component of risk judgement which includes risk tolerance. Unlike risk perception which is an individual level phenomenon, risk tolerance is a contextual or occupational level phenomenon which determines the amount of tolerable risks (Oppong, 2015).

Risk tolerance has been found to be significantly related to risk perception. For example, in a study of self-reported accident involvement among aircrafts, Hunter (2002) separated risk tolerance and risk perception and observed that risk tolerance was negatively related to risk perception. Thus, individual pilots who reported high risk tolerance recorded low risk perception. Risk perception was found to significantly predict self-reported engagement in hazardous events. Risk tolerance on the other hand did not

predict involvement in hazardous events. Hunter (2002) therefore concluded that differences in cognitive skills required for accurate risk perception places pilots at a greater likelihood of accident involvement, rather than differences in underlying personality traits related to risk tolerance. This means that there are contextual (cultural and occupational) differences when it comes to judgement of risks. Khan et al. (2015) have also reported similar findings in traffic risk, driving behaviour and road safety in a comparative study between Malaysia and Singapore. In a self-reported study of safety attitudes, driver behaviour and traffic risk perceptions among 187 Singaporean and 313 Malaysian drivers, Khan et al. (2015) observed that in both countries, perceived traffic risk fully mediated the relationship between perceived driving skills and engagement in road safety behaviours and partially mediated the relationship between driving skills and aggression and anxiety on the road. They therefore concluded that traffic risk perception is an important factor in driver behaviour both in Malaysia and Singapore.

In a meta-analysis study of experimental studies examining the effect of risk appraisals in changing people's behaviour, Sheeran, Harris and Epton (2013) reported that heightening risk appraisal had effect on both intention and behaviour. They identified that both cognitive (perceived risk and perceived severity) and affective (anticipatory emotion and anticipated emotions) combined to influence intentions and behaviours. For example, they observed that cognitive risk perception (heightening risk) had larger effects on both intentions and behaviours when affective risk perception (anticipatory emotions) was also high.

These studies, put together show that risk perception (as a product of individual level judgement) is influenced by risk tolerance. Where risk tolerance is high, risk perception is low. Risk perception has also been found to have different components (mainly cognitive and affective) that all combine to influence intentions and behaviours

(in this case driver behaviour). There have also been national or contextual differences in how risk perception influence behaviours of drivers.

Socio-demographic Variables, Risk Perceptions and Driving Behaviours

A number of socio-demographic characteristics have been identified to influence both risk perception and driving behaviours. The main demographic variables are gender, age, years of experience, educational level and family or household size. In Ghana for instance, Akaateba et al. (2015) have examined the influence of educational attainment, driving experience and form of driver training on self-reported attitudes and frequency of committing traffic safety violations. Interestingly, Akaateba et al. (2015) observed in their study that the frequency of commission of traffic violations was positively correlated with years of driving experience but was negatively correlated with increasing level of education. Drivers who were trained in driving schools were found to report higher frequency of violations of traffic regulations compared to those who were learned driving in informal institutions.

Gwyther and Holland (2012) also examined age, gender and attitudinal differences in self-regulated driving behaviours among a sample of 395 drivers in the United Kingdom. With respect to gender differences, they observed that women were significantly more likely to engage in self-regulated driving compared to men. They also observed that women were significantly more likely to be influenced by their emotions negatively when driving compared to men. With respect to age differences, they observed a quadratic effect on self-regulated driving, such that older and younger drivers reported higher score for self-regulated driving compared to middle-aged drivers. However, the effect of age was found to be affected by years of experiences in a way that when years of experience were controlled for, self-regulated driving increased with age. Negative

emotions in the form of anxious driving style and negative affective attitude were found to independently predict self-regulated driving behaviours (Gwyther & Holland, 2012).

Machado-Leon et al. (2016) have also reported similar findings in their study cited earlier on traffic crash risk perception. In assessing the influence of driving experience, household size and gender on drivers' perceptions of traffic risk, they reported a significant gender differences. They found that women were less likely to respect safe distance in crash risk perception compared to men. On the other hand, men more likely to drive under unsafe or optimal personal conditions in their crash risk perceptions compared to women. They also reported that not respecting the rules of passing another car in crash risk perception tends to be significantly lower as the number of people in a household increases (Machado-Leon et al., 2016). Thus, drivers with higher household size were more likely to have higher traffic crash risk perception. Drivers with less experience were also found to perceive higher traffic crash perception than those with more driving experience. Years of experience was therefore negatively related to traffic risk perceptions.

Similar findings with regards to socio-demographic variables have been reported in other studies elsewhere. Significant gender differences in risk perceptions and risky behaviours for instance have also been recorded in experimental study in Spain (Herrero-Fernandez et al., 2016), risky driving behaviours and accident involvement in Norway (Sigve & Rundmo, 2006) and both physical and financial risk in the Netherlands (Cobey, Stulp, Laan, Buunk & Pollet, 2013).

Personality Factors on Risk Perception and Driving Behaviour

The big five personality factors have been purported to comprise extraversion, agreeableness, conscientiousness, neuroticism and openness. Extraversion is seen as a personality factor that encompasses traits such as the quality of being sociable, active and

assertive. This personality trait also correlates with taking leadership roles in teams or groups as well as having high energy levels and more people oriented (John et al., 2008). Extraversion is characterised by sensation seeking and would therefore lead to risky and aberrant driving behaviours (Herrero-Fernandez, 2016). Agreeableness, a second factor of personality focuses on the individual's social relationships, trust levels, straightforwardness, modesty and tender-mindedness (Costa & McCrae, 1992). People low on this factor tend to be unfriendly, irritable and rude as well as possessing a general lack of compliance, and a general disregard for rules and laws. It is therefore believed that people high in agreeableness would find it easy to comply with driving regulations and therefore engage less in risky driving behaviours.

Conscientiousness denotes task- and goal-directed behaviour and thus such people tend to be very good at organizing, prioritizing and planning (John et al., 2008). It is made up of competence, order, dutifulness, achievement striving and self-discipline (Costa & McCrae, 1992). Neuroticism on the other hand has been found to include anxiety, anger hostility, depression, self-consciousness, impulsiveness as well as vulnerability (Costa & McCrae, 1992; John et al., 2008). Neuroticism has also been found to be linked with poor coping skills, frequent job changes and experience of burnout. Further studies have shown that anxiety, a component of neuroticism is significantly correlated with excitement seeking and risky driving behaviours (Oltedal & Rundmo, 2006). Openness connotes the deeper level and original nature and depth of an individual's emotional and mental life. It also consists of the feelings, actions, ideas and values (Costa & McCrae, 1992; John et al., 2008) Researchers have also linked openness with certain types of unsafe driving, for example a relationship between openness and the aggressive use of a vehicle, as well as traffic accidents have been established. (Benfield, Szlemko, & Bell, 2007; Cellar, Nelson & Yorke, 2000).

Rationale for the Study

Putting all the studies reviewed above together shows that driver behaviours have been explored very well in the literature. However, the literature does not provide conclusive knowledge on driver behaviours, especially with regards to how risk perception influence driving behaviours. There are a number of issues that need further empirical investigations.

For example, the literature on risk perception is limited. Judgement of risk has been found to be controlled by two distinct factors; risk tolerance and risk perception (Lehmann, Haight & Michael, 2009). Risk perception alone has been argued to comprise of cognitive and affective components (e.g., Sheeran et al., 2013). Risk tolerance has been found to be negatively related to risk perception (Hunter, 2002). But how risk tolerance is related to the different component of risk perception (cognitive and affective) is still not known in the literature.

The influences of age, gender, years of driving experience and household size have been mainly examined on driving behaviours. For example, males and females have been found to engage in different domains of risky driving behaviours (e.g., Machado-Leone et al., 2016) yet females have been reported of having higher risk perception compared to males (e.g., Cobey et al., 2013; Herrero-Fernandez et al., 2016). However, how gender differences moderates the relationship between traffic risk perception and driver behaviours is still not well understood. Age and years of experience have also been found to co-vary together to influence risky driving behaviours (e.g., Gwyther & Holland, 2012). But their (age and years of experience) influence on risk perception has not been well explored directly. The influence of household size on traffic risk perception and driving behaviours also need further investigation.

The current study therefore filled these gaps by empirically examining how risk tolerance influence risk perception and how the different components of risk perception influence driving behaviours among drivers. Socio-demographic variables (age, gender, years of experience and household size) are also examined for the possible moderation roles between risk perception and driving behaviours. These relationships were also explored between private and commercial drivers.

Statement of Hypothesis

Based on the literature review, the following hypotheses were formulated and tested;

H1: Risk Tolerance negatively predicts driving behaviours such that higher risk tolerance will be associated with higher risk driving behaviours.

H2: Risk Perception significantly predicts driving behaviours among the drivers such that high risk perception significantly reduces risky driving behaviours.

H2a: High Cognitive risk perception is associated with low risky driving behaviours

H2b: High affective risk perception is associated with high risky driving behaviours

H3: Personality factors moderate the relationship between risk perception and risky driving behaviours such that the effect of risk perception on risky driving behaviour depends on personality factors.

H4: Risk Perception mediates the relationship between risk tolerance and risky driving behaviours.

Hypothesised Model

Figure 1 shows the hypothesised model that summarises the relationships tested in the study based on the hypotheses stated. As shown in the model, risk tolerance is hypothesised to influence traffic risk perception. Traffic risk perception is hypothesised to predict driving behaviours; however, the relationship is expected to be moderated by

factors such as personality, years of experience, age, gender and household size of the driver.

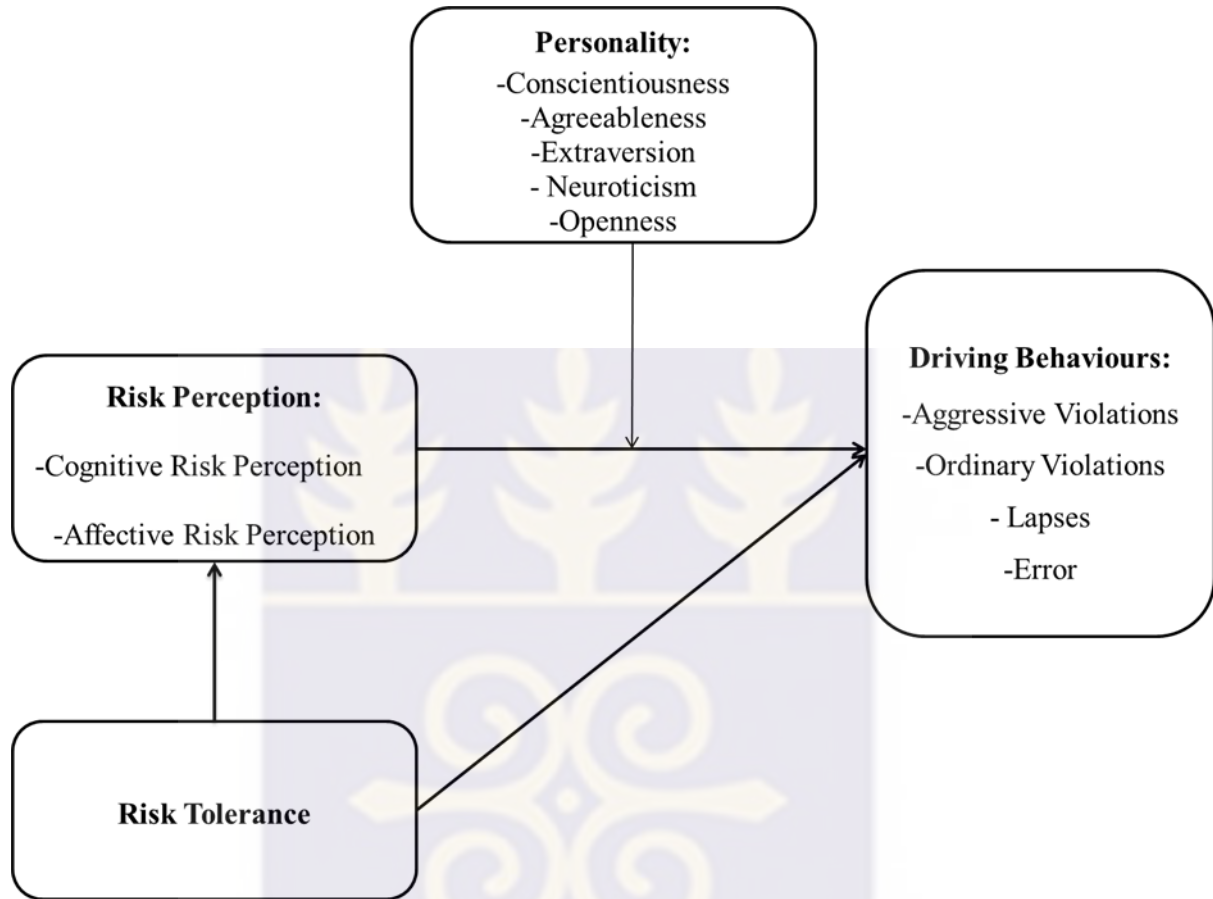


Figure 1: Hypothesised Model of Traffic Risk Perception, Risk Tolerance and Driving Behaviour

CHAPTER THREE

METHODOLOGY

This chapter contains the detailed methodological procedures that were employed in gathering and analysing data for the study. The sub-sections here include; descriptions of the research design and approach, population of the study, sample size and sampling technique, description of measures, procedures for data collection, proposed data analyses and ethical issues of the study.

Research Design

A cross-sectional survey design was used to gather data for the study. Surveys are mostly used in studies that assess attitudes and orientations in a large population where individual respondents are the unit of analysis (Babbie, 2004). Again, the use of the survey method provides an advantage of capturing large sample of drivers for the study which helps to generalise the findings. The cross-sectional survey design was therefore suited for the purpose of exploring individual-level variables in the current study.

Study Setting

The study was carried out within the Accra Metropolis. The Metropolis is chosen because statistics from the National Road Safety Commission (NRSC, 2016) indicates that the Accra Metropolis is one the districts in Ghana that record highest road traffic offenses and road traffic accidents. Several other studies (e.g., Ackah & Adonteng, 2011; Nyarko, 2016) also indicate that most of the road traffic accidents involve commercial drivers. Also, due to its cosmopolitan nature, the metropolis is made up of people with diverse backgrounds cutting across ethnic, religious, education and socio-economic backgrounds. Because of this, findings from the study could reflect the situation in other parts of the country. Specifically, three commercial bus stations or terminals were selected for the study. The stations that were selected for the study were: circle bus station, Madina station and

Achimota New Station. These stations were selected due to their potential of providing a pool of drivers to be sampled for the study. The stations serve as destinations and points of departure for the commercial drivers. Because of this, the drivers can be accessed and surveyed when they are waiting for their turn to load passengers or when they arrive from their trip.

Population of the Study

The population of the study consisted of commercial drivers from three bus stations. Specifically, commercial drivers who used long buses or other such vehicles popularly known as 'trotro' were the target population. This category was used because of the rate at which these drivers ply the roads in Ghana.

Sample and Sampling Techniques

A set of inclusion and exclusion criteria were applied to serve as the guide in the process of selecting the commercial drivers for the study. In terms of inclusion criteria, commercial drivers qualified to be part of the study are those who drove long buses and other vehicles popularly referred to as 'trotro'. In this respect, commercial drivers consisted of trotro drivers, taxi drivers and long bus drivers. Again, to qualify to be included in the study, the driver must have been engaged in commercial driving occupation for at least one continuous year. This is to ensure that by one year, the driver must have been met with or engaged in some road behaviours which are being assessed in the study. From the population, a sample size of two hundred (200) commercial drivers was targeted. By the nature of the study, the participants had relatively low levels of education. Because of this, the survey took the form of researcher-administered, where the researcher read and explained the items to the drivers in the language they understood

(mostly Twi and sometimes Ga) and the responses provided. For the few who could read and write, the surveys were given out to them to respond.

By the nature of the participants, there were several instances where the survey administration would start and the driver has to leave, either to load his vehicle or that the vehicle is full with passengers so had to drive them. Because of this, it was very difficult getting the commercial drivers to respond to all the items in the questionnaire. So at the end of the whole data gathering process, a total of one hundred and sixty (160) drivers had been surveyed. However, in processing the questionnaires for data entry, one hundred and fifty-one (151) of the questionnaires were judged as good for analyses. Thus, the sample size of the study was therefore 151 commercial drivers. The sample was judged to be adequate for analyses using guidelines based on Cohen (1992). Using the formula for sample size determination by Cohen (1992), for a study that intends to use multiple regression analysis, which has about 4 predictors, with a medium effect size and an alpha level of .01, the minimum sample size should be 118. Therefore, the final sample size of 151 which were used for the analyses was adequate for statistical analyses.

The convenience sampling technique was used to select drivers for the study. In each of the three stations, only commercial drivers who were available and agreed to be part of the study were used for the study. The reason for the choice of such a non-probability sampling technique was because of the nature of work of the target group. The commercial drivers were on duty working and therefore had little time to spare. Because of that, only drivers who were waiting in-line to load their vehicles were used for the study because they could have some time to spare. The convenience sampling technique was therefore the best technique under the circumstance for selecting participants for the study.

The demographic characteristics of the participants are provided on Table 1. In terms of age, the minimum age of the participants was 20 years and the maximum age was 60

years. Majority (70%) of the participants were between the ages of 31 – 50years. In terms of tenure, the minimum years of experience were 1 year and the maximum years were 30 years. Majority of the participants had basic education (59.6%) and only few of them reported having any form of tertiary (post-secondary level) education (5.3%).

Table 1: Demographic Characteristics of Participants (N = 151)

Variables	Categories	<i>F</i>	%
Age	20 - 30years	25	16.6
	31 - 40years	46	30.5
	41 - 50years	46	30.5
	51 - 60years	34	22.5
	Total	151	100.0
Years of Driving Experience	1 - 5years	25	16.6
	6 - 10years	36	23.8
	11 - 15years	33	21.9
	16 - 20years	24	15.9
	21 - 25years	28	18.5
	26 - 30years	5	3.3
	Total	151	100.0
Education	Basic	90	59.6
	Senior High	53	35.1
	Tertiary	8	5.3
	Total	151	100.0
Marriage	Single	24	15.9
	Married	98	64.9
	Divorced	18	11.9
	Widowed	11	7.3
	Total	151	100.0

Measures and Instruments

Risk perception was measured using the Risk Perception Scale for Drivers by Rundmo and Iverson (2004). The scale is a 10-item scale that assesses three domains of

risk perception; emotion-based risk perception (4 items), cognition-based risk perception (4 items) and concern for traffic safety (2 items). The 10 items are measured on 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale has high internal consistency with a Cronbach alpha of .81. The highest possible score is 50 and the lowest possible score is 10. Higher scores signify higher risk perception and lower scores signifies lower risk perception.

Risk tolerance was measured by adapting the hypothetical scenario measure developed by Lehman et al. (2009). The hypothetical scenario measure assesses risk tolerance by asking participants to rate their levels of comfort with three scenarios which are developed to reflect situations representing three levels of increasing risk from low to medium to high. Similar approach of measuring risk tolerance has been used by other researchers such as Reyna and Lloyd (2006) and Hunter (2002). Level of comfort is rated on a 4-point Likert scale from 1 = very comfortable to 4 = very uncomfortable, where higher scores indicate lower risk tolerance. This measure of risk tolerance has recorded high reliability with a Cronbach alpha of .81 (Linensenbigler, 2009).

The Five-Factor Inventory (Costa & McCrae, 2010) was used to measure three dimensions of the big five model of personality. The instrument originally has five dimensions, namely: openness, conscientiousness, extraversion, agreeableness and neuroticism. All responses on this instrument were rated on a 5-point Likert scale with two anchors (5 = very true; 1 = very false) in this study. The personality scale has 25 items and high reliability values with Cronbach alpha values ranging between 0.79 and 0.78. A sample item on this scale is: "I don't know why I do some of the things I do".

The Driver Behaviour Questionnaire (DBQ) was used to measure driving behaviour among the participants. The DBQ is a prominent measurement scale to examine drivers' self-reported aberrant behaviour and has been used in several studies in many

countries and despite minor cultural nuances, the distinction between errors as unintentional mistakes and violations as deliberate acts has been supported by all international studies (Sucha, Sramkova & Risser, 2014). The DBQ (The Manchester Driver Behaviour Questionnaire) is a self-report questionnaire developed by Reason, Manstead, Stradling, Baxter, and Campbell (1990) in the United Kingdom as a measure of aberrant driving behaviours.

The original version comprises 50 items referring to drivers' aberrations. Respondents are asked to rate on a six-point scale (1= never; 2=hardly ever; 3=occasionally; 4=quite often; 5= frequently; 6=nearly all the time) how often they experience specific types of aberrant driving behaviours. Sample items in the questionnaire include; "Attempt to drive away with the handbrake on," "Overtake a single line of stationary or slow-moving vehicles, only to discover that they were queuing to get through a one-lane gap". For the purposes of this study, the 27-item cross-cultural version of the DBQ was used. The 27-item cross-cultural version of the DBQ has recorded reliability figures ranging from .73 to .84 (Sarbescu, 2013; Sucha et al., 2014). Several exploratory and confirmatory factor analyses study of the DBQ has provided about four subscales which are; lapses, errors, ordinary violations and aggressive violations with (e.g., Sarbescu, 2013).

Procedure for Data Collection

The study began by sending an introductory letter from the management of the Bus Terminal Drivers Association requesting for the permission carry out the study there. After the letter was honoured, the researcher, together with three research assistants was called and introduced to sample the commercial drivers present. The purpose of the study was explained to the drivers and after that sought their consent to take part of the study.

The pilot study

The pilot study was conducted to test the psychometric properties of the scales before they were used for the main study. The pilot study was conducted using a sample size of twenty (20) commercial drivers conveniently selected from one of the commercial vehicle stations (i.e. Madina Station) where the study was conducted. After ethical clearance was obtained for the study, permission was then sought from the executive members of the commercial drivers' union in all the stations chosen for the study. After the permission was granted, the 20 commercial drivers who met the inclusion criteria were sampled for the pilot study. The pilot study was also meant to test how the commercial drivers made sense of all the items that make up the scales. Where possible, some items that did not reflect in their context were adapted and modified to suit their context.

The ages of the pilot sample ranged between 27 years and 53 years, with a mean age of 33.7 years ($SD = 3.8$ years). Their years of experience ranged between 3 years and 18 years, with a mean of 8.2 years ($SD = 2.6$ years). All of them had either no education (25%) or at most some basic education (75%). The commercial drivers who were used for the pilot study were not included in the main study. The Cronbach alpha values of the scales after the pilot study are provided on Table 2.

Table 2: Reliability Values of Piloted Scales

Scales	No. of Items	α
Risk Tolerance Scale	3	.779
<i>Total Risk Perception</i>	10	.883
Affective Risk Perception Subscale	5	.842
Cognitive Risk Perception Subscale	5	.817
<i>Total Driver Behaviours</i>	27	.839
Lapses subscale	8	.821
Errors subscale	8	.792
Ordinary Violations subscale	8	.782
Aggressive Violations subscale	3	.778
<i>Total Personality Scale</i>	20	.857
Conscientiousness	4	.854
Extraversion	4	.821
Agreeableness	4	.798
Neuroticism	4	.78
Imagination (Openness)	4	.821

The Table 2 shows that the Cronbach alpha (α) values of the scales and their sub-scales .778 - .883. The values mean that the scales have high internal consistencies. According to Tavakol and Dennick (2011), the acceptable level of internal consistency of a scale should range between 0.75 – 0.90. Therefore, the scales and their sub-scales were judged to be reliable for the study.

The main study

After the pilot study, the main study was then conducted. The field work in the form of data collection took place from middle of January to middle of March 2017. The field work began after the training of three (3) research assistants who mainly assisted with field survey administration with the researcher. The first week of the fieldwork was used for recruiting participants for the study and booking appointment for survey administration. In the recruitment process, those who had the ability to read and write offered to respond to

the questionnaires by themselves. And so for such drivers, the questionnaires were given to them during the recruitment process.

Ethical Considerations

High level of ethical standards was maintained throughout each stage of the study. To start with, ethical clearance was obtained the Ethical Committee for Humanities (ECH) of the University of Ghana. During the recruitment process, the nature and purpose of the study was explained to participants to be able to understand what the study entails. In seeking consent from the participants, they were made aware of the voluntary nature of the study, their right to withdraw at any point in time without explanation or penalty and will also be assured of privacy and confidentiality.

During the recruitment process, consent was mainly sought verbally to be able to book appointment for the survey. However, those who agreed to participate in the study were given the informed consent form to sign on the day of administering the survey. After the survey administration, the researcher addressed any concerns that the participants had about the study in the form of debriefing.

Finally, the contact details of the research as well as that of the Ethics Committee for Humanities at the University of Ghana were provided to participants if they needed any further information. Participants were given oral appreciation (Thank You) for their participation in the study.

CHAPTER FOUR

RESULTS

The study examined the influence of risk tolerance, risk perceptions and driver behaviour among commercial drivers in Accra Metropolis. The specific objectives that guided the study were; to examine the effect of traffic risk tolerance on traffic risk perceptions, to examine the effect of traffic risk perception on driver behaviours, to assess the moderating role of personality factors on the relationship between risk perception and driver behaviours among the commercial drivers.

The data was analyzed using hierarchical multiple regressions with the help of Statistical Package for Social Sciences (SPSS) version 18. The chapter is presented in the following order; preliminary analyses are presented in the form of testing assumptions, descriptive statistics and correlation matrix. After that, test of the hypotheses are presented. Then summary of the findings and observed model are presented next.

Preliminary Analyses

The preliminary analyses were conducted to among other things to test for the factor structure of the scales used in the study, test for the distribution of the data using descriptive statistics, correlations among the variables and also to test for the assumptions of multiple regression analysis to make sure that all the assumptions were met before testing the hypotheses.

Factor Analysis

Factor analyses were conducted on the scales with sub-scales to assess the underlying structure of the variables in the current study within Ghanaian context. The factor analyses were done using principal axis factoring with varimax rotation. It was expected that all items that measure the same construct load onto the same factor (Tabachnick & Fidell, 2007). Factor loadings were set at .40 for all the scales. Assumption of sampling adequacy was tested using Kaiser-Meyer-Olkin (KMO) test and the number of factors to be extracted was determined using Eigen values greater than 1 and scree plot (Pallant, 2010).

Risk Perception Scale

The results of factor analysis for risk perception scale are summarized on Table 5. Sampling adequacy using KMO test was found to be significant (KMO = .838, $\chi^2 = 729.744$, $p < .001$). Two factors were extracted after inspecting Eigen values of two factors exceeding 1 and the scree plot, where it was observed to levelled out after the second factor (see Appendix I). Factor loading was set at .40. The two factors explained cumulative variance of 62.056%. The first factor, with Eigen value of 4.565 explained 45.65% variance and the second factor with Eigen value of 1.641 explained 16.1%.

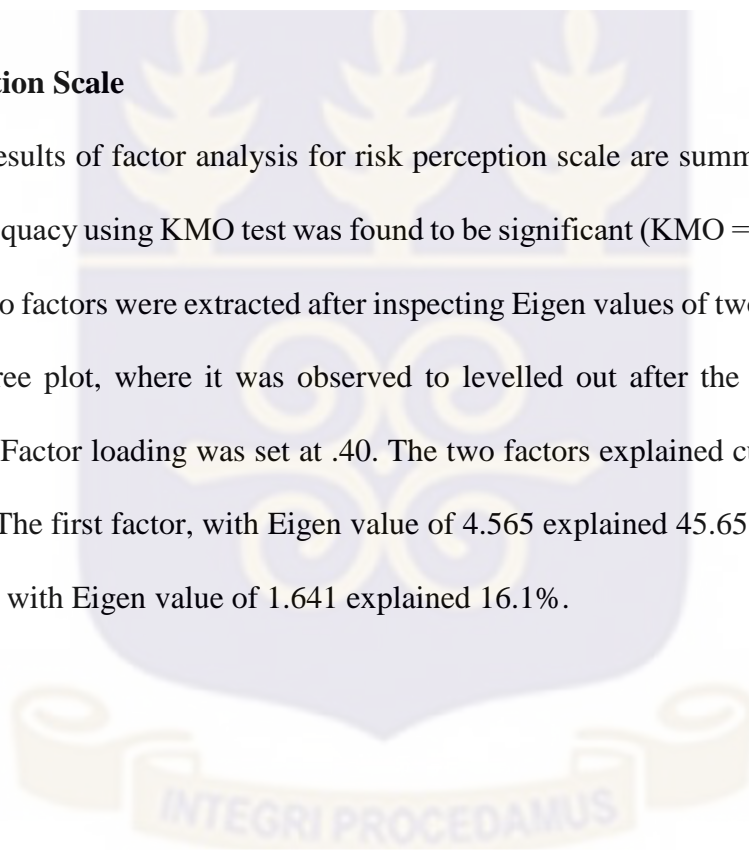


Table 3: Factor loadings based on a Principal Axis Factoring with Varimax Perception Scale (N = 151)

Items	Factor	
	Affect Risk Perception	Cognitive Risk Perception
Feeling unsafe that you yourself could be injured in a traffic crash	.695	.416
Worried for yourself being injured in a traffic crash	.910	
Feeling unsafe that person's could be injured	.883	
Worried for persons being injured in traffic crash	.585	
I think it is very probable for me to be involved in a traffic crash	.451	.615
I see myself as more How probable do you think it is for yourself to be injured in a traffic crash		.476
It is very probable for drivers in general to be involved in a traffic crash		.571
It is very easy for people to be injured in a traffic crash		.798
How concerned are you about traffic risks and are thinking that you yourself could be victimized		.661
How concerned are you about traffic risks and are thinking that others could be victimized		.523

Driver Behaviour Questionnaire

The results of factor analysis for the driver behaviour questionnaire are summarized on Table 6. Sampling adequacy using KMO test was found to be significant (KMO = .710, $\chi^2 = 2170.974$, $p < .001$). Four factors were extracted after inspecting Eigen values where five factors had Eigen exceeding 1 and the scree plot, where it was judged to levelled out after the fourth factor (see Appendix II).

Factor loading was set at .40. The four factors explained cumulative variance of 61.173%. The first factor, with Eigen value of 6.242 explained 23.117% variance, the second factor with Eigen value of 2.95 explained 11.282%, the third factor with Eigen value of 2.447 explained 9.063% and the fourth factor with Eigen value of 2.178 explained 8.067%.



Items	Factors			
	1	2	3	4
Hit something when reversing that you had not previously seen	.632			
Intending to drive to destination A, you “wake up” to find yourself on the road to destination B	.760			
Get into the wrong lane approaching a roundabout or a junction	.870			
Switch one thing, such as the headlights, when you meant to switch on something else, such as the wiper	.748			
Attempt to drive away from the traffic lights in third gear	.565			
Forget where you left your car in a car park	.509			
Misread the signs and exit from a roundabout on the wrong road	.541			
Realize that you have no clear recollection of the road along which you have just been travelling	.415			.436
Queuing to turn left onto a main road, you pay such close attention to the main stream of traffic that you nearly hit the car in front of you		.562		
Fail to notice that pedestrians are crossing when turning into a side street from a main road		.558		
Fail to check your rear-view mirror before pulling out, changing lanes, etc.		.480		
Brake too quickly on a slippery road or steer the wrong way in a skid		.670		
On turning left nearly hit a cyclist who has come up on your inside		.768		
Miss “Give Way” signs and narrowly avoid colliding with traffic having right of way		.796		
Attempt to overtake someone that you had not noticed to be signalling a right turn		.737		
Pull out of a junction so far that the driver with right of way has to stop and let you out			.634	
Disregard the speed limit on a residential road			.573	
Stay in a motorway lane that you know will be closed ahead until the last minute before forcing your way into the other lane			.747	

Overtake a slow driver on the inside	.718
Race away from traffic lights with the intention of beating the driver next to you	.705
Drive so close to the car in front that it would be difficult to stop in an emergency	.579
Disregard the speed limit on a motorway	.543
Sound your horn to indicate your annoyance to another road user	.484
Become angered by another driver and give chase with the intention of giving him/her a piece of your mind	.811
Become angered by a certain type of a driver and indicate your hostility by whatever means you can	.789

Table 4: Factor loadings based on a Principal Axis Factoring with Varimax Rotation for Risk Driver Behaviour Questionnaire (N = 151)

Factor 1 = Errors Factor 2 = Lapses Factor 3 = Ordinary Violations

Factor 4 = Aggressive Violations

Personality Factors

The results of factor analysis for the driver behaviour questionnaire are summarized on Table 6. Sampling adequacy using KMO test was found to be significant (KMO = .701, $\chi^2 = 1407.630$, $p < .001$). Five factors were extracted after inspecting Eigen values where five factors had Eigen exceeding 1 and the scree plot, where it was judged to levelled out after the fifth factor (see Appendix III).

The two factors explained cumulative variance of 69.02%. The first factor, with Eigen value of 5.090 explained 28.280% variance, the second factor with Eigen value of 2.507 explained 13.928%, the third factor with Eigen value of 1.943 explained 10.792%, the fourth factor with Eigen value of 1.515 explained 8.415% and the fifth factor with Eigen value of 1.369 explained 7.604%

Table 5: Factor loadings based on a Principal Axis Factoring with Varimax Rotation for Risk Driver Behaviour Questionnaire (N = 151)

Items	Factor				
	E	A	N	C	O
Am the life of the party (I like attending parties)	.435				
Sympathize with others' feelings				.826	
Get chores done right away(I do not delay in getting thing done)				.757	
Have frequent mood swings.			.440		
Have a very good imagination		.758			
Don't talk a lot		.791			
Am not interested in other people's problems		.541			.469
Often forget to put things back in their proper place.					.581
Am relaxed most of the time		.644			
Am not interested in abstract ideas (I don't like thinking about things I can't see)					.539
Talk to a lot of different people at parties					
Feel others' emotions.			.689		
Get upset easily.			.959		
Have difficulty understanding abstract ideas. (I find it difficult understanding things I can't see or touch)				.452	
Keep in the background (I don't like drawing attention to myself)	.453	.618			
Am not really interested in others	.606				
Make a mess of things	.706				
Seldom feel blue (I do not feel sad often)	.935				
Do not have a good imagination	.670				

E = Extraversion, A = Agreeableness, C = Conscientiousness, O = Openness,

N = Neuroticism

Descriptive statistics of the study variables

The descriptive statistics are provided in Table 3 to give an understanding of the distribution of scores of all the variables in the study.

The values of Cronbach alpha (α values ranging between .763 and .873) shown on Table 6 shows that all the scales and their sub-scales had acceptable levels of internal consistency and therefore can be judged as being reliable.

Table 6: Descriptive Statistics of Study Variables (N = 151)

Variables	M	SD	Skewness	Kurtosis	α
Risk Tolerance	7.79	3.52	-.019	-1.346	.817
Total Risk Perception	32.34	8.29	-.293	-1.035	.864
Affective Risk Perception	14.42	5.45	-.681	-1.033	.873
Cognitive Risk Perception	17.92	4.21	-.197	-.709	.807
Total Driver Behaviour	80.99	15.19	-.185	-.496	.868
Lapses	27.43	8.74	-.223	-.474	.837
Errors	26.01	9.65	-.405	-.886	.763
Ordinary Violations	16.05	7.78	1.128	.663	.780
Aggressive Violations	11.50	4.66	-.503	-.870	.791
Extraversion	8.63	3.43	-.138	-.956	.805
Neuroticism	12.31	4.93	.037	-1.237	.811
Conscientiousness	14.17	4.92	.266	-.789	.810
Agreeableness	15.31	4.06	.425	-.541	.801
Openness	15.05	4.02	.591	-.301	.798

Correlation matrix of the study variables

The correlations matrix was assessed among the study variables using the Pearson r statistical test. The summary of the results are presented Table 7.

A significant negative relationship was observed between risk tolerance and all two components of risk perception (affective risk perceptions and cognitive risk perceptions), some components of driving behaviours (errors and aggressive violations) and some component of personality factors (neuroticism and conscientiousness). A significant positive correlation was observed between risk tolerance and ordinary violations component of driving behaviours and extraversion component personality.

Affective risk perception is positively correlated with errors and aggressive violations and negatively with ordinary violations, as well as neuroticism component of personality. But it was negatively correlated with extraversion. Cognitive risk perception is positively correlated with errors and aggressive violations components of driving behaviour, neuroticism and conscientiousness and negatively with ordinary violations and extraversion.

Neuroticism is negatively correlated with risk tolerance which means that high levels of neuroticism is associated with lower levels of tolerating risk. Neuroticism is also positively associated with both affective risk perception and cognitive risk perception which means that higher levels of neuroticism are associated with increased affective and cognitive risk perceptions.

Table 7: Correlation Matrix of Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Risk Tolerance	1											
2. Affective Risk Perception	-.650 ^{***}	1										
3. Cognitive Risk Perception	-.381 ^{**}	.465 ^{***}	1									
4. Lapses	-.002	-.038	-.045	1								
5. Errors	-.570 ^{**}	.794 ^{**}	.344 ^{**}	.022	1							
6. Ordinary Violations	.347 ^{**}	-.442 ^{**}	-.398 ^{**}	-.027	-.349 ^{**}	1						
7. Aggressive Violations	-.568 ^{***}	.778 ^{**}	.365 ^{**}	-.025	.669 ^{***}	-.369 ^{**}	1					
8. Extraversion	.647 ^{***}	-.448 ^{**}	-.316 ^{**}	.112	-.367 ^{**}	.293 ^{**}	-.335 ^{**}	1				
9. Neuroticism	-.379 ^{**}	.662 ^{***}	.400 ^{**}	-.051	.612 ^{**}	-.278 ^{**}	.536 ^{**}	-.376 ^{**}	1			
10. Conscientiousness	-.220 ^{**}	.146	.328 ^{**}	-.048	.109	-.064	.154	-.207 [*]	.026	1		
11. Agreeableness	.019	-.047	-.073	-.211 ^{**}	.009	.056	.102	-.146	.025	.095	1	
12. Imagination/Openness	-.017	.088	-.034	-.182 [*]	.108	-.014	.032	-.177 [*]	-.020	.269 ^{**}	.303 ^{**}	1

* $p < .05$, ** $p < .01$, *** $p < .001$

Testing Hypotheses

The hypotheses were tested using series of multiple regressions analyses. Assumptions under multiple regressions were tested first before estimating the models.

Testing assumptions of hierarchical multiple regression

The assumptions tested included multicollinearity and normality of the data and presence of outliers. The assumption of multicollinearity was tested using tolerance values and variance inflation factor (VIF). According to Pallent (2010), for data with no multicollinearity, the tolerance values range between .223 to .991 and VIF should range between 1.031 to 1.761. During exploration of the data, it was observed that age and years of experience were highly correlated ($r = .864$, $p < .001$) and so multicollinearity was detected between age (VIF = 4.465) and years of experience (VIF = 4.014). Because previous studies (e.g., Akaateba et al., 2015) have shown that years of driving experience affect safety behaviours among drivers more than age, age was taken out of the model. After that, the multicollinearity disappeared with tolerance values ranging between .664 and .779 and VIF ranging between 1.284 and 1.511.

The assumption of normality of the data was tested using skewness to detect outliers and kurtosis to check the distribution of the scores. According to Tabachnick and Fidell (2007), data with no outliers have skewness values ranging between +1.00 and -1.00 and data with normal distribution have values of the kurtosis ranging between +2 and -2. As shown on Table 3, the skewness values ranged between -.681 and .591 and that of the kurtosis ranged between -1.346 and .663. The skewness and the kurtosis values therefore show that the data was normally distributed with no outliers.

With all assumptions of multiple regression (multicollinearity, normality, presence of outliers) all met, a series of hierarchical multiple regression analyses were conducted to test the effects of the predictors on driving behaviours. The hierarchical multiple regression helped in controlling for demographic variables (years of experience and level of education) and testing for moderation and mediation analysis (Pallant, 2010).

Risk Tolerance and Driving Behaviours: in analysing the effect of risk tolerance and driver behaviours, the effect on overall driver behaviour was analyzed first, and after that, the effect on the sub-domains (aggressive violations, errors, ordinary violations and lapses) of driver behaviours were analyzed. This helped to understand the nuance of how risk perception influence driver behaviour as a whole and the various components.

In the models, the control variables were entered first in step 1 and after that risk tolerance was entered next in step 2. In terms of the effect on driving behaviours, the overall model was found to be significant

The control variables (years of driving experience and level of education) were entered in step 1 and the predictor variables were entered in step 2. The overall model was found to be significant ($F = 7.559, p < .001$) and accounted for 13.4% variance in overall driving behaviour ($R^2 = .134$). In the step 1, the control variables did not account for any significant variance in overall driving behaviours ($F = .680, p = .508$). In the step 2, the risk tolerance significantly predicted overall driving behaviour ($\Delta F = 21.132, p < .001$). A unit increase in risk tolerance is associated with 35.4% increase in risky driving behaviours ($\beta = .354, t = 4.597, p < .001$).

Series of hierarchical regressions were conducted to examine the effect of risk tolerance on the different components of risky driving behaviours.

Table 8: Summary of Hierarchical Multiple Regression Analysis for Risk Tolerance and Driver Behaviour (N=151)

Model		B	β	t	p
1	Years of Driving Experience	.163	.076	.807	.421
	Education	1.709	.067	.713	.477
2	Risk Tolerance	1.528	.354	4.597	.000

Step 1: $R = .095$, $R^2 = \Delta R^2 = .009$, Adjusted $R^2 = .004$, $F = .580$, $df1 = 2$, $df2 = 148$, $p = .508$

Step 1: $R = .366$, $R^2 = .134$, Adjusted $R^2 = .116$, $\Delta R^2 = .125$, $\Delta F = 21.132$, $df1 = 1$, $df2 = 147$, $p = .000$

The overall model was found to be significant ($F = 7.559$, $p < .001$) accounting for 13.4% variance in risky driving behaviours ($R^2 = .134$). At step 1, the control variables did not account for significant variance in risky driving behaviours [$F(2, 148) = .580$, $p = .508$].

At step 2, risk perception accounted for significant variance in risky driving behaviours [$\Delta F(1, 147) = 21.132$, $p < .001$] accounting for 12.5% variance ($\Delta R^2 = .125$). As shown on Table 5, a unit increase in risk tolerance among the commercial drivers was associated with 35.4% increase in risky driving behaviours.

This finding supports hypothesis 1 of the study which stated that higher risk tolerance will be associated with high risky driving behaviours.

Because four different dimensions of risky driving behaviours were assessed, series of multiple regression analyses were conducted to further explore the domains of risky driving behaviours that risk tolerance actually affect. The results from the analysis are provided on Table 9.

Table 9: Summary of Regression Table

Criterion	Model	R	R ²	Adjusted R ²	ΔR ²	ΔF	df1	df2	p	β	t
Aggressive violations	1	.082	.007	-.007	.007	.504	2	148	.605		
	2	.572	.327	.313	.320	70.012	1	147	.000	.486***	8.367
Ordinary Violations	1	.127	.016	.003	.016	1.206	2	148	.302		
	2	.380	.145	.127	.129	22.086	1	147	.000	.360***	4.70
Errors	1	.057	.003	-.010	.003	.243	2	148	.785		
	2	.579	.336	.322	.332	73.584	1	147	.000	.479***	8.578
Lapses	1	.096	.009	-.004	.009	.682	2	148	.507		
	2	.096	.009	-.011	.000	.005	1	147	.945	.006	.069

Step 1: Years of Driving Experience and education

Step 2: Risk Tolerance

*** significant $p < .001$

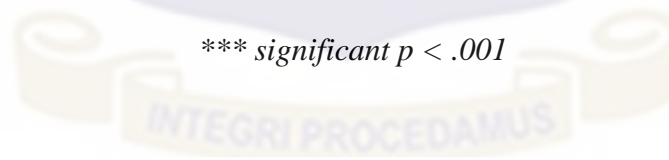


Table 6 shows the significance of the overall model in three of the four domains of risky driving behaviours. After controlling for years of driving experience and education, risk tolerance three domains of risky driving behaviours (aggressive violations, ordinary violations and lapses).

Risk tolerance predicted aggressive violations ($\Delta F = 70.012$, $p < .001$) accounting for additional 32.7% variance ($\Delta R^2 = .331$). A unit increase in risk tolerance leads to 48.6% increase aggressive violations ($\beta = .486$).

Risk tolerance also predicted ordinary violations ($\Delta F = 22.086$, $p < .001$) accounting for additional 12.9% variance ($\Delta R^2 = .129$). A unit increase in risk tolerance leads to 36% increase in ordinary violations ($\beta = .360$).

Lastly, risk tolerance also predicted errors ($\Delta F = 73.584$, $p < .001$) accounting for additional 33.2% variance ($\Delta R^2 = .332$). A unit increase in risk tolerance leads to 47.9% increase in errors ($\beta = .479$).

This means that high risk tolerance increases overall risky driving behaviours and three components of risk driving behaviours; aggressive violations, ordinary violations and errors but not lapses.

Risk Perception and Driver Behaviour: in analysing the effect of risk perceptions and driver behaviours, the effect on overall driver behaviour was analyzed first, and after that, the effect on the sub-domains (aggressive violations, errors, ordinary violations and lapses) of driver behaviours were analyzed. This helped to understand the nuance of how risk perception influence driver behaviour as a whole and the various components.

In each of the models, the control variables were entered first in step 1 and after that the predictor variables (cognitive risk perception and affective risk perception) were

entered next in step 2. In terms of the effect on driving behaviours, the overall model was found to be significant.

The control variables (years of driving experience and level of education) were entered in step 1 and the two predictor variables were entered in step 2. The overall model was found to be significant ($F = 13.86, p < .001$) and accounted for 27.5% variance in overall driving behaviour ($R^2 = .275$). In the step 1, the control variables did not account for any significant variance in overall driving behaviours ($F = .680, p = .508$). In the step 2, the two dimensions of risk perception significantly predicted overall driving behaviour ($\Delta F = 27.5, p < .001$). Cognitive and affective risk perceptions together explained an additional 26.6% variance in driving behaviours ($\Delta R^2 = .266$). This means that the hypothesis 2 which predicted that risk perception predicts driving behaviours has been supported.

Table 10: Summary of Hierarchical Multiple Regression Analysis for Risk Perception and Driver Behaviour (N=151)

Model		B	Beta	t	p
1	Years of Driving Experience	.251	.117	1.355	.178
	Education	1.811	.071	.822	.413
2	Cognitive Risk Perception	-.570	-.158	-1.977	.050
	Affective Risk Perception	1.593	.571	7.157	.000

Step 1: $R = .095, R^2 = \Delta R^2 = .009, Adjusted R^2 = .004, F = .580, df1 = 2, df2 = 148, p = .508$

Step 2: $R = .525, R^2 = .275, Adjusted R^2 = .255, \Delta R^2 = .266, \Delta F = 26.802, df1 = 2, df2 = 146, p < .001$

In order to examine the sub-hypotheses, the two dimensions of risk perception were examined to ascertain their independent effect on driving behaviours. The summary of the results have been provided in Table 7.

Table 7 shows that only cognitive risk perception was negatively associated with risky driving behaviour as predicted by hypothesis 2a but was not significant ($\beta = -.158$, $t = -1.977$, $p = .05$). This means that hypothesis 2a was not supported. Affective risk perception was able to positively predict overall risky driving behaviours ($\beta = .571$, $t = 7.157$, $p < .001$) as predicted by hypothesis 2b. This means that hypothesis 2b has been supported.

Because four different dimensions of risky driving behaviours were assessed, series of multiple regression analyses were conducted to further explore the domains of risky driving behaviours that risk tolerance actually affect. The results from the analysis are provided on Table 8.

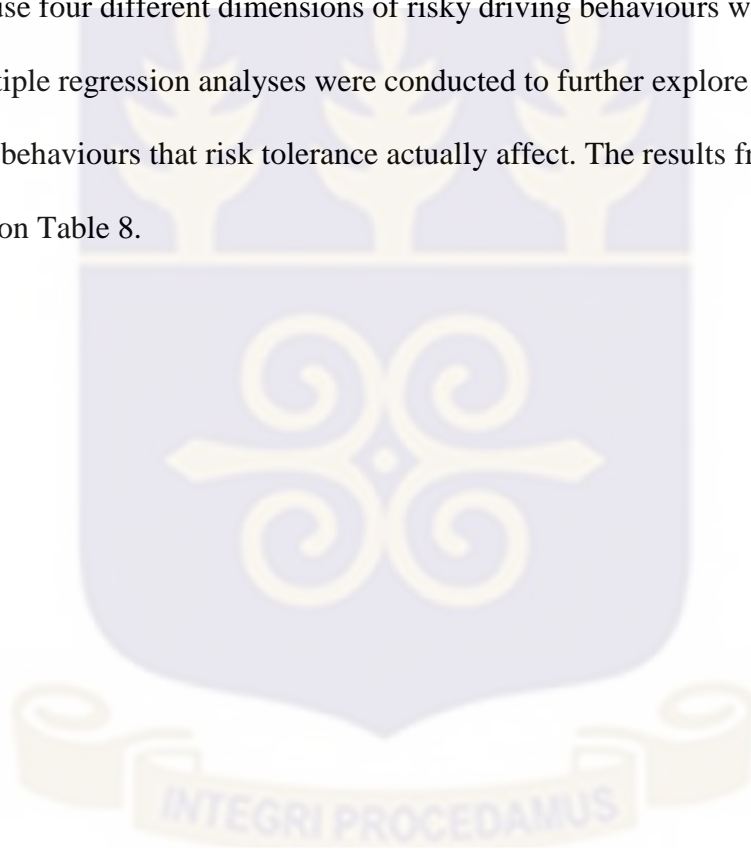


Table 11: Summary of Hierarchical Regression Model

Criterion	Model	R	R ²	Adjusted R ²	ΔR ²	ΔF	df1	df2	p	β	t
Aggressive violations	1	.082	.007	.007	.007	.504	2	148	.605		
	2	.580	.409	.498	.402	112.299	2	146	.000	.009	.155 ^a
Ordinary Violations	1	.127	.016	.003	.016	1.206	2	148	.302	-.236	-2.908 ^a
	2	.503	.253	.232	.237	23.110	2	146	.000	-.331 ^{**}	-4.078 ^b
Errors	1	.057	.003	-.010	.003	.243	2	148	.785	-.040	-.706 ^a
	2	.799 ^b	.638	.628	.635	128.171	2	146	.000	.416 ^{***}	14.476 ^b
Lapses	1	.096	.009	-.004	.009	.682	2	148	.507	-.025	-.272 ^a
	2	.105 ^b	.011	-.016	.002	.141	2	146	.869	-.026	-.276 ^b

Step 1: Years of Driving Experience and education

Step 2: Cognitive Risk Perception and Affective Risk Perception

*** significant $p < .001$; *a* = cognitive risk perception, *b* = affective risk perception

When the independent effects of affective and cognitive risk perceptions on the four components of driving behaviours were examined, it was observed that affective risk perception positively predicted aggressive violations ($\beta = .673, p < .001$) and driver errors ($\beta = .416, p < .001$) and negatively predicted ordinary violations ($\beta = -.331, p < .001$). Cognitive risk perception only negatively predicted ordinary violations ($\beta = -.236, p < .01$). Neither affective nor cognitive risk perceptions predicted driver lapses.

Moderation Analysis of Personality Factors on Risk Perception and Driver Behaviour

The moderation hypotheses were analyzed using the moderated hierarchical multiple regression. The analytical procedures followed those outlined by Baron and Kenny (1986). Prior to the analyses, the predictor variable (risk perception) and the moderator variables (personality factors) were all entered first. After that, interaction terms were created between risk perception and each of the five personality factors. There interaction terms were then used as the moderator variables.

In analysing Hypothesis 2, dispositional empathy was entered in step 1, age was entered in step 2 and the interaction variable was entered in step 3. According to Baron and Kenny (1986), moderation takes place when the interaction variable accounts for significant variance in the dependent variable after controlling for the variance accounted for by the predictor and moderator variables. The results of the moderation analysis for hypothesis 2 are summarised in Table 8.

Table 12: Summary of Moderation of Personality Factors on the Relationship between Risk Perception and Driver Behaviour

Model		B	β	t	p
1	Risk Perception	.689	.376	4.954	.000
2	Conscientious	.026	.008	.101	.920
	Neuroticism	.783	.254	2.508	.013
	Openness	-.067	-.018	-.214	.831
	Extraversion	.361	.082	.928	.355
	Agreeableness	-.107	-.028	-.352	.725
3	Risk Perception X Conscientious	.066	.182	1.908	.058
	Risk Perception X _Agreeableness	-.026	-.054	-.680	.498
	Risk Perception X Openness	.004	.008	.097	.922
	Risk Perception X Neuroticism	-.112	-.261	-3.089	.002
	Risk Perception X Extraversion	-.014	-.024	-.276	.783

The overall model was significant ($F = 25.178$, $p < .001$) and explained 66.6% of variance in driving behaviour ($R^2 = .666\%$). In step two, the five personality factors predicted driver behaviours ($\Delta F = 2.419$, $p < .05$), explaining additional 3.1% ($\Delta R^2 = .031\%$) variance in driving behaviour. In step 3, the interaction terms together significantly predicted driver behaviours ($\Delta F = 2.441$, $p < .05$), explaining additional 2.9% ($\Delta R^2 = .029\%$) variance in driving behaviour.

Risk perception significantly predicted driver behaviours in step 1 ($\beta = .376$, $t = 4.954$, $p < .001$). In step 2, only neuroticism significantly predicted driver behaviours ($\beta = .254$, $t = 2.508$, $p < .05$). In step 3, the interaction between risk perception and neuroticism

significantly predicted driving behaviours ($\beta = -.261, t = -3.098, p < .05$). This means that neuroticism moderate the relationship between risk perception and driving behaviours. The moderating role of personality hypothesis has therefore been partially supported.

Mediation Analysis of Risk Perception between Risk Tolerance and Driving Behaviours

In testing the mediating effect of risk perception on the relationship between risk tolerance and behaviour, a three-step procedure suggested by Baron and Kenny (1986) was followed. In step 1, the mediator (risk perception) is regressed on the predictor (risk tolerance) and the predictor should be able to predict the mediator.

In step 2, the criterion (driving behaviour) is regressed on the predictor (risk tolerance) and risk tolerance should predict driving behaviour. In step 3, driving behaviour is regressed on both risk tolerance and risk perception. At this stage, it is expected that risk perception should predict driving behaviours in a way that decreases the effect of risk tolerance on driving behaviours.

At the final step, when risk tolerance does not predict driving behaviours but the risk perception does, the mediation becomes a full mediation where risk perception carries all the effect of risk tolerance to driving behaviours. However, if risk tolerance still predicts the driving behaviour at the final step after the risk perception has predicted the driving behaviour, the mediation becomes partial mediation where the mediator carries significant portion (not full) of the effect of the predictor to the criterions (Baron & Kenny, 1986; Hayes et al., 2011). A series of regression analyses were therefore conducted and the results displayed on Table 4.7.

Table 13: Summary of Mediated Effect of Risk Perception between Risk Tolerance and Driver Behaviour

Step	Predictor	Criterion	B	SE	β	p
1	Risk Tolerance	Risk Perception	-1.463	.151	-.621	.000
2	Risk Tolerance	Driver Behaviour	-1.552	.330	-.360	.000
3	Risk Tolerance	Driver Behaviour	-.885	.413	-.205	.034
	Risk Perception		.456	.175	.249	.010

Sobel Test for significant mediation; Z = 0.00969, p = .992

Table 4.7 shows that in step 1, risk tolerance significantly predicted risk perception ($\beta = -.621, p < .001$). At step 2, risk tolerance significantly predicted driving behaviours ($\beta = -.360, p < .001$). At step 3, driving behaviours was predicted by both risk perception ($\beta = .249, p < .05$) and risk tolerance but the effect of risk tolerance is reduced ($\beta = -.205, p < .05$). The significant effect of risk perception on driving behaviours and the reduction of the effect of risk tolerance at step 3 suggest the presence of mediating effect according to Baron and Kenny (1986).

A Sobel Test for significance of mediation was therefore tested and the results showed that risk perception does not significantly mediate the relationship between risk tolerance and driving behaviours ($Z = .00969, p = .992$). Therefore, the hypothesis that risk perception mediates the effect of risk tolerances on driving behaviours was supported.

Summary of Findings

In summary, risk tolerance was found to increase overall risky driving behaviours and three components of risk driving behaviours; aggressive violations, ordinary violations and errors but not lapses.

Risk perception positively predicted driving behaviours. When the two components of risk perceptions were analyzed, it was observed that only affective component of risk perception positively predicted driving behaviours.

When risk perception was analyzed against the four dimensions of driving behaviours, it was observed that affective risk perception positively predicted aggressive violations and driver errors but negatively predicted ordinary violations. Cognitive risk perception only negatively predicted ordinary violations. Neither affective nor cognitive risk perceptions predicted driver lapses.

For the moderation role of personality, it was observed that neuroticism moderated the relationship between risk perception and driving behaviours.

The findings are summarized on the figure 2 below.

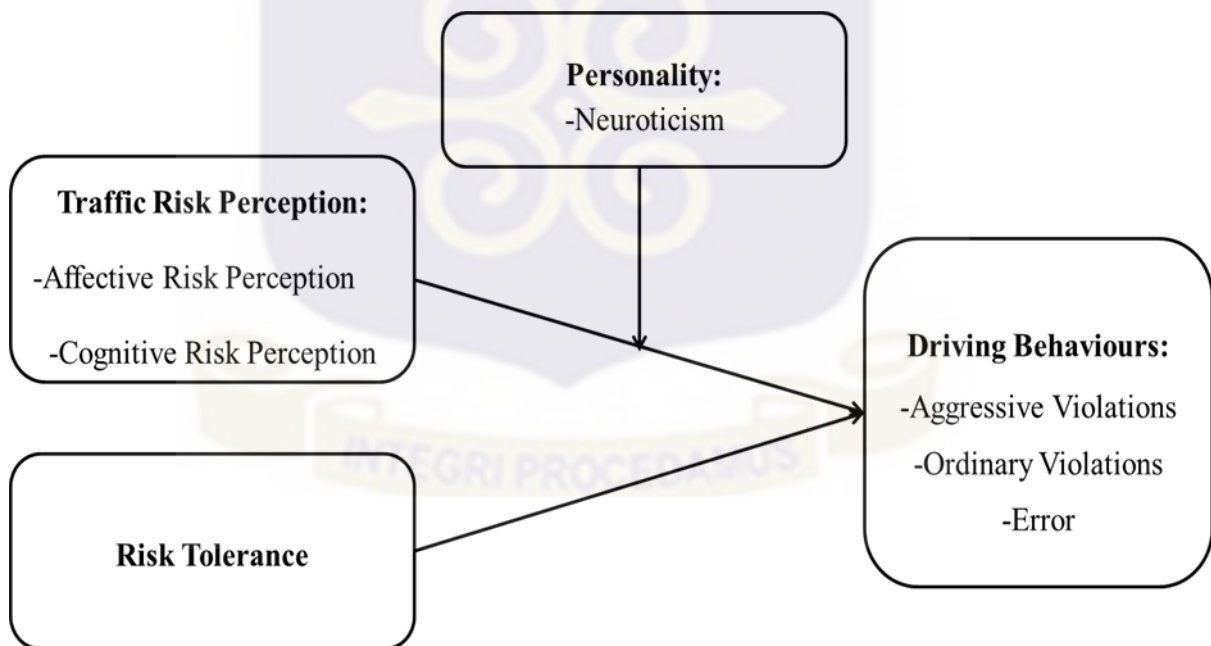


Figure 2: Observed Model of Driving Behaviours among Commercial Drivers in Ghana

CHAPTER FIVE

DISCUSSION

Two theories are used as frameworks to examine individual differences in driving behaviours among commercial drivers in Accra, Ghana. These theories are the risk preference theory and the protection motivation theory. The risk preference theory proposes that individuals have natural predispositions towards risk (Roth et al., 2007). This natural predisposition is arguing to determine the amount of risk individuals can tolerate and what actions individuals perceive as dangerous (Escher, 2010). The protection motivation theory proposes that individuals protect themselves when they anticipate danger or negative consequences (Khazode et al., 2012). Thus, per the assumption of the protection motivation theory, there is a direct negative relationship between risk perception and injury.

In the context of driving, the two theories propose that there is a negative association between risk perceptions and unsafe driving behaviours. But there are some difficulties with this assertion. First of all, having a natural predisposition for risk means that individuals differ in the amount of risk they can tolerate (risk tolerance) and how they evaluate risky behaviours (risk perception). Individual differences in risk tolerance and risk perception shape their protective behaviours. However, most studies on risk only concentrate on risk perception to the neglect of risk tolerance. Secondly, risk perception has both the cognitive component and the affective component (Iverson et al., 2002). However, the effect of affective risk perception on risk behaviours is under researched. Thirdly, the role of personality in individual differences in risk evaluation and risky behaviours are least examined empirically.

Using the context of commercial driving in Ghana, the current study empirically examined how risk perception and risk tolerance influence driving behaviours in Ghana

and the role of personality factors in the relationship. Four key objectives underpinned the study. First, the effect of risk tolerance on risk driving behaviours among commercial drivers was examined. Secondly, the influence of different component of risk perception (affective and cognitive) on risky driving behaviours was assessed. Thirdly, the mediating role of risk perception between risk tolerance and risky driving behaviours was also examined. Lastly, the moderating role of personality factors on the relationship between risk perception and driving behaviour was examined.

In this chapter, findings from the study are integrated and discussed for a holistic understanding of how individual differences in risk predispositions and personality shape risky driving behaviours among commercial drivers in Ghana. The practical and theoretical implications of the findings are also discussed as well as limitations of the study and recommendations for future research.

Risk Tolerance and Driving Behaviours

The first objective of this thesis was to examine the relation between risk tolerance and risky driving circumstances among commercial drivers and to examine whether the observed relations would be the same for the different components of risky driving behaviours. The hierarchical multiple regression analyses showed that after controlling for years of driving experience and education, a significant positive association was found between risk tolerance and risky driving behaviours. This association was significant for aggressive violations, ordinary violations and errors but did not hold for lapses.

These findings mean that differences in the amount of risk individuals can tolerate shape driving behaviour. Being able to tolerate high risk increases risky driving behaviours among the commercial drivers. Thus, as the commercial drivers tolerate high risk, their aggressive violations, ordinary violations and errors increase. High risk

tolerance is associated with high risky driving behaviours because the higher risk individuals are able to tolerate, their threshold for judging danger increases. They judge dangerous behaviours as less dangerous and therefore less likely to take precautionary measures because they do not perceive the situation as dangerous.

These findings are somewhat consistent with findings from other previous studies (e.g., Hunter, 2002; Khan et al., 2015) in which high risk tolerance is found to be associated with low risk perception. Because the current study was conducted among commercial drivers, it was expected that higher risk tolerance would be consistent. One reason for the observed association might be explain the way driving behaviours were measured. The driver behaviour questionnaire examines the traffic mistakes or errors drivers make on the road. All four sub-scales examine negative and risky driving behaviours including aggressive violations, ordinary violations, errors and lapses.

These driving behaviours are expected to be common among commercial drivers. This is because they earn their living by driving long hours on daily basis and so comparatively are more likely to commit most of the traffic errors the items in the questionnaire measured. Again, because they are exposed to different driving behaviours on the road on daily basis, they become used to them and therefore their threshold for tolerating these risky driving behaviours rises. When that happens, they are more likely to engage in certain risky driving behaviours because they are less likely to judge certain ordinary driving behaviours as dangerous on their part. For example, Simsekoglu (2013) in both Turkey and Iran, commercial drivers report high traffic risk tolerance and therefore have low traffic risk judgement and low road safety compliance.

In the current study, driving behaviours were measured as the mistakes usually made on the road which required the commercial drivers to examine recollection of how

often they have engaged in or committed one road safety error or the other. Therefore, the effect of risk tolerance on driving behaviours may be attributed mainly to the commercial nature of the drivers.

Risk Perception and Driving Behaviours

The second objective of the study was to examine the effect of (affective and cognitive) risk perception on driving behaviours among the commercial drivers. The multiple regression analysis showed that after controlling for years of driving experience and education, a significant negative association was found between risk tolerance and risky driving behaviours.

However, one major finding from this study is that when the two components of risk perceptions were analyzed, it was observed that affective risk perception and cognitive risk perception differentially influenced driving behaviours. When the two components of risk perception was analyzed against the four dimensions of driving behaviours, it was observed that affective risk perception positively predicted total driving behaviours, aggressive violations and errors but negatively predicted ordinary violations. Cognitive risk perception only negatively predicted ordinary violations. Neither affective nor cognitive risk perceptions predicted driver lapses.

What these findings mean is that the effects of risk perception on driving behaviours are seen within the affective risk perception component. Affective risk perception reduces ordinary violations but increases aggressive violations and errors. Cognitive risk perceptions on the other hand decrease ordinary violations. These findings are not entirely consistent with findings from other previous studies (e.g., Chen et al., 2016; Machado-Leon et al., 2016; On et al., 2016; Simsekoglu et al., 2013) in which risk perception is reported to influence both safety and risky driving behaviours.

Simsekoglu et al. (2013) for instance have reported that among drivers in Turkey, high risk perception is associated with precautionary driving behaviours but not fatalism. Among Iranian drivers however, risk perception had no significant effect on driving behaviours. Contrary to the findings from Iranian drivers, the current study finds significant influence on driving behaviours. However, consistent with the Turkish drivers, risk perception is negatively associated with ordinary violations. However, most of the previous studies measure risk perceptions in composite forms and so there is lack of understanding concerning how different aspect of risk perceptions affect driving behaviours.

In the current study however, examining the different aspect of risk perception shows that emotions underlie the influence of risk perception on driving behaviours. High affective risk perception is found to rather increase risky driving behaviours in the form of aggressive violation and errors. The negative association between risk perception and risky driving behaviours is observed within ordinary violations. However, when it comes to risky driving behaviours, increasing affective risk perception is associated with increasing aggressive violations and errors.

One reason for the findings in the current study may be explained by the way driving behaviours are measured. The aggressive violations sub-scale for instance assesses driving behaviours in response to provocations from other drivers. For instance, the items measuring aggressive violations included; 'sound your horn to indicate their annoyance to another road user', 'become angered by another driver and give chase with the intention of giving him/her a piece of your mind' and 'become angered by a certain type of a driver and indicate your hostility by whatever means you can'. These responses are emotionally-motivated driving behaviours and so drivers who are high on affective risk perception

would not only perceive high severity in the provocation, but also respond more aggressively.

Sheran et al. (2013) have reported that affective risk perception is characterized by heightened risk appraisal and heightened response. Because of this, drivers who are high on affective risk perception would have heightened appraisal of danger in offenses from other drivers. Because of the heightened risk appraisal, they respond with high aggression and in the process. When that happens, the aggressive responses itself is considered as risky driving behaviour and in the process, also make several driving errors. Thus, contrary to the assertion that high risk perception increase saves driving behaviours (e.g., Hoekstra-Atwood et al., 2016), when emotions underlie risk perception, high risk perceptions rather increase risky driving behaviours.

Risk Perception, Personality and Driving Behaviours

Another objective of the study was to examine the moderating role of personality factors (as measured by the five factor model) in the association between risk perception and driving behaviours. It was hypothesized that the effect of risk perception on driving behaviour would depend on the personality of the driver. A moderated multiple regression analysis showed that neuroticism moderated the relationship between risk perception and driving behaviours. Specifically, the effect of risk perception on risky driving behaviour was exacerbated by neuroticism.

In the current study, affective risk perception led to increase in aggressive violations and errors. This means that the effect is further made worse by neuroticism. This finding is consistent with earlier finding that reported high accident involvement in professional drivers and motorists who score high on neuroticism (Ge et al., 2014; Wallace et al., 2003). In a meta-analytic study of personality and traffic-related accidents, af Wählberg et.

(2017) for instance reported that high neuroticism is the strongest single predictor of transportation-related accidents.

The mechanisms that link high neuroticism to high risk perception and high accident involvement might be because of some characteristics that hinders accuracy of judgement (Guo et al., 2016). Neuroticism is characterised by anxiety, hostility, depression, self-consciousness and impulsivity which make neurotics become pre-occupied with self-anxiety (Soto et al., 2013; Tao et al., 2017). Because of these, perhaps commercial drivers who are high on neuroticism might become overly anxious about safety on the road. Because of that they might perceive higher risk in road situations and as a result become very hostile towards offensive driving from other drivers. This might explain why neuroticism increases the negative effect of risk perception on risky driving behaviours among commercial drivers.

Implications of the Study

This study has shown that high cognitive risk perception only reduces ordinary violations among drivers. However, high affective risk perception increases aggressive violations and errors among drivers. Also, being high on neuroticism exacerbates the effect of affective risk perception on risky driving behaviours. These findings mean that emotions underpin how risk perceptions affect driving behaviours. These findings have both theoretical and practical implications.

Practical implications of the study

These findings also have implications on the way drivers are trained, especially regarding manuals used in the training of drivers. Training manuals that have been developed to train drivers should not only focus on the mechanical skills of moving a vehicle and how drivers should relate to signs on the road. But more importantly, the

psychological processes that shape decision making when driving should be given maximum attention. From the findings in the current study, affective predispositions of would be drivers and how that shape their levels of risk tolerance and perceptions should be given attention during the training process.

Whiles the training cannot change dispositional make up of drivers, an expert focus on it would make them aware of how their affective dispositions and personality characteristics influence their evaluation and judgement of traffic regulations and their driving behaviours. This would require that the National Road Safety Commission and Driver and Vehicular Licensing Authority (DVLA) make psychological testing and assessment a requirement in acquiring or renewing driving license in Ghana. In this regard, the expertise of professional psychologists needs to be engage in designing and administering of psychological assessment test for drivers.

The findings from the study also have implications on the development of road safety policies and campaigns. Road safety messages in Ghana are full of fear-arousing images and messages. The rationale is that such messages would arouse fear in drivers and make them abide by road safety rules and regulations. However, empirical studies in Ghana (e.g. Anakwah et al., 2015) show that fear arousing messages do not work. Based on the findings from the current study, these fear arousing messages might even be contributing to increased aggressive driving behaviours.

This is because when fear arouses in the drivers, it is also likely to increase their affective risk perceptions and therefore offensive violations against them from other motorists might be met with extreme aggressive response such as road rage. Thus, instead of arousing fear to ensure safety driving, the unintended effect would be that affective risk perceptions would rise to cause more aggressive violations and errors among drivers. Thus, road safety messages and campaigns should be designed in such a way that

increases cognitive-based perception and reduces emotions-based perception to reduce aggressive violations and errors among drivers.

Theoretical implications of the study

The findings from the current study also have significant implications on the theories used as framework for this study. While the findings confirm the propositions in the risk preference theory, the findings call for revision of the protection motivation theory. The revision in the theory is within the mechanisms proposed by the protection motivation theory between evaluation of risk and protective behaviours.

The protection motivation proposes that individuals protect themselves when they anticipate risk and as such have the desire to take preventive measures to prevent accident or injury from happening (Khazode et al., 2012). Two implicit assumptions of the theory stand out; First of all, the PMT conceptualises protective behaviours as risk perception and evaluation. Secondly, risk perception and evaluation is assumed to be a product of an individual's subjective cognitive and affective judgment.

By conceptualising protective or safety behaviours as following right after risk perception, the PMT conceptualises individuals as rational being who would always drive safely when they perceive higher risk. However, findings from the current study do not provide empirical evidence to support the claims by PMT. The current study has shown that higher levels of affective risk perceptions actually increase risky driving behaviours. Contrary to the PMT theory, as affective risk perception increases, individuals are not motivated to protect their safety but they are moved to protect their ego by engaging in retaliatory behaviours in the form of increased aggressive violations and errors.

Thus, instead of being moved towards self-protection when risk is perceived, in the current study, when emotions (in the form of emotive-risk and neuroticism) underpin risk

evaluation and judgement, individuals revenge provocations from other motorists.

Findings from the current study therefore suggest that the PM theory need to factor in irrational or emotional decision making processes within the association between risk perception and safety behaviours.

Limitations of the Study

There are some limitations in this study that needs to be taken into consideration for the purposes of interpretations and applications of the findings in the study. The main limitations pertain to the way in which driving behaviour was measured. Driving behaviours were mainly measured in terms of risky driving behaviours. The focus on risky driving behaviour means that some caution should therefore be exercised in generalizing the results to safety driving behaviours among commercial drivers.

Another limitation in this study also pertains to the measurement of aggressive violations sub-scale of driving behaviours. Risky driving behaviours could be as results of offensive driving actions of drivers against other motorists or defensive driving actions of drivers in response to provocations from other motorists or road users. However, the items that measured aggressive violations mainly focused on risky driving behaviours in response to provocations from other motorists.

On one hand, the items assessing response to offenses mean that the measure examines driving behaviours when emotions have been provoked. The heightened emotions as a result of the provocations may inflate the impact of emotional risk perceptions on risky driving behaviours. On the other hand, assessing aggressive violations only in terms of offensive response terms does not provide understanding into unprovoked aggressive driving behaviours among the commercial drivers. Therefore,

some caution should also be exercised in generalizing the results to unprovoked or offensive aggressive driving behaviours.

Recommendations for Future Research

Notwithstanding the limitations enumerated, findings from the study provide insight into the complexities and the nuances of how risk tolerance and risk perceptions affect risky driving behaviours among commercial drivers and the role played by personality actors. It is therefore imperative that further studies are carried to deepen understanding of the area. Based on the limitations, the following recommendations are made for future studies:

First of all, future studies should consider examining driving behaviours in terms of both safe driving and risky driving behaviours. This is because the theoretical proposition is that high level of risk tolerance increases individuals' threshold for tolerating perceived danger and as such less likely to engage in protective behaviours in situations where they can stomach the danger. Also, high risk perception leads to a lowering threshold for evaluating the inherent danger in situations. By this, high risk tolerance is associated with less protective behaviours while high risk perception is associated with more protective behaviours. However, driving behaviours in this study were mainly measured in terms of risky driving behaviours and therefore there is no evidence of how risk tolerance and perception affect safety driving behaviours among commercial drivers. Future studies should therefore consider examining this further by measuring driving behaviours in terms of both safe driving and risky driving behaviours.

Secondly, future studies should consider measuring aggressive violations in offensive terms rather than in defensive terms. The current study has shown that high affective risk perceptions increase aggressive violations and errors. But these were

measured in terms of drivers' response to provocation from other motorists. There is the need for further understanding into how risk tolerance and risk perceptions shape offensive behaviours among drivers when there has not been any prior immediate provocation from other motorists or road users. Thus, such studies would provide further understanding into how risk tolerance and perception shape unprovoked aggressive driving behaviours among drivers.

Thirdly, the current study has shown that emotions underlie how risk perception influence risky driving behaviours among commercial drivers. Some recent studies (e.g., Kováčsová et al., 2016; Precht et al., 2017) have also reported how emotions shape driver behaviours. Further studies into the complex world of emotions and driving behaviours are therefore needed to understand how emotions affect both safe and unsafe driving behaviours. In this regard, constructs like emotional intelligence should be considered in future studies.

Furthermore, the current study was conducted using only commercial drivers and the justification for the focus on commercial drivers have been justified. However, there are other motorists who also require attention. Comparative studies for instance among commercial drivers, private vehicle drivers and motor riders for instance would also provide deeper understanding into how risk tolerance and risk perception shape driver behaviours. Future studies should therefore consider including sample of all kinds of motorists.

The last recommendation for future studies pertain to methodological innovations. Both emotions, which have been shown to be relevant in the current study and risk tolerance and perceptions, are complex constructs. Therefore, future studies must consider using other methodological techniques that allow for deeper examinations of the

constructs and how they shape driver behaviours. In this regard, it is suggested that qualitative methodologies should also be used to delve deeper into the complex emotions of the drivers and how that shape their decisions on the road.

Conclusion

It has been theorized that individual difference in risk perceptions and risk tolerance influence driving behaviours. The protection motivation theory for instance assumes that individuals are motivated to engage in protective behaviours when they perceive risk or danger (Khazode et al., 2012; Nordfjaern et al., 2011). The risk preference theory also assumes that individuals have natural predisposition towards risk which determine the amount of risk they can tolerate and how they evaluate risky situations (Escher, 2010; Roth et al., 2007).

Using commercial drivers in Accra, Ghana, the current study examined how individual differences in risk tolerance and risk perceptions affect risky driving behaviours and the role of personality factors in the relationships. Consistent with the risk preference theory, significant associations were found between both risk tolerance and risk perception and driver behaviours. However, the findings from the current study show contradictions to the assumptions of the protection motivation theory.

Consistent with risk preference theory, findings from the study showed that high risk tolerance was positively associated with aggressive violations, errors and ordinary violations among the commercial drivers. Also, consistent with both risk preference theory and protection motivation theory, high cognitive perception was associated with low ordinary violations. However, contrary to the protection motivation theory, high affective risk perception was associated with high aggressive violations and errors. The study

further provides that the association between risk perception and risky driving behaviour is further worsened by neuroticism personality factor.

This leads to the conclusion that emotions underlie protection motivations among drivers. In other words, drivers do not necessarily engage in protective behaviours when they perceive risk as assumed by the protection motivation theory. As a matter of fact, when emotions underlie risk perception, drivers engage in more aggressive driving behaviours and make more errors which put them and other road users in further and higher risks.



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APPENDICES

APPENDIX A

UNIVERSITY OF GHANA

DEPARTMENT OF PSYCHOLOGY

DRIVER BEHAVIOUR STUDY

General Information about the Study

This study is basically about driving behaviours among commercial drivers. The main aim is to explore the extent to which risk perception, risk tolerance and personality factors influence driving behaviours among commercial drivers. The study is purely for academic purposes and so participation is strictly voluntary with no associated penalty should you decline to participate. Participation will involve taking responding to a questionnaire that assesses risk tolerance, risk perception, personality characteristics and driving behaviours. The questionnaire should last between 15-20 minutes.

Benefits/Risk of the study

The study does not involve any known risks except the time and effort spent responding to the survey instrument. Benefit of taking part in the study include raising your awareness about the various factors that affect your driving behaviours so that a deeper understanding can help improve road safety policies and interventions.

Confidentiality

All data collected will be used for academic purposes only and as such your privacy and confidentiality are assured as you will not be required to provide any personally identifying information.

Compensation

Your participation will be compensated in kind at the end of the interview or survey as a show of appreciation for their time and effort in participating in the study. The compensation will be in a form of airtime credits based on the network used by the participants.

Contact for Additional Information

If you need any further clarification, you can reach the researcher on 0540294085 or through the mail at priscykaf@gmail.com. You can also write to the Department of Psychology, University of Ghana, Legon. If you have any questions about your rights as a research participant in this study you may also contact the Administrator of the Ethics Committee for Humanities, ISSER, University of Ghana at ech@isser.edu.gh / ech@ug.edu.gh or 00233-303-933-86

VOLUNTEER AGREEMENT

"I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent for me to participate in this study. I will not have waived any of my rights by signing this consent form. Upon signing this consent form, I will receive a copy for my personal records."

Signature

Date

A. Socio-Demographic Information

Gender: Male Female

Age (in years): _____

Years of Driving Experience _____ Type of Driver Private Commercial

Educational Level: Basic Senior High Diploma/HND

First Degree Masters PhD

Marital Status: Single Married Divorced Separated Widowed Co-habiting

Number of Children _____

B. Risk Tolerance

Read the following hypothetical situations and rate your level of comfort; 1 = very uncomfortable, 2 = uncomfortable, 3 = comfortable and 4 = very comfortable

Hypothetical Scenarios:	1	2	3	4
<p>Risk Scenario 1: Low Personal Risk</p> <p>It is the end of the work shift. On the way out, a worker notices a broken electrical conduit. It is not in his area of the work site. Reporting the problem will make him late getting home. He leaves without reporting what he saw</p>				
<p>Risk Scenario 2: Medium Personal Risk</p> <p>It is Friday, the end of the work week. The person responsible for doing the pre-shift inspections is rushed for time. Today, he hurries through the pre-shift inspection in just a few minutes. Usually, the inspection takes much longer to complete</p>				
<p>Risk Scenario 3: High Personal Risk</p> <p>A worker is in the process of changing a screen and he drops a wrench onto the conveyor belt. Instead of locking out the conveyor belt first, he climbs onto the belt, picks up the wrench, and continues working</p>				

C. Risk Perception

Here are a number of items that are assessing your evaluation and judgement of traffic rules and situations when you are driving. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

1 = Strongly Disagree 2 = Disagree 3 = Neither Agree nor Disagree

4 = Agree 5 = Strongly Agree

No.	Item	1	2	3	4	5
	Emotion-based Risk Perception					
1	Feeling unsafe that you yourself could be injured in a traffic crash					
2	Worried for yourself being injured in a traffic crash					
3	Feeling unsafe that persons could be injured in a traffic crash					
4	Worried for persons being injured in a traffic crash					
	Cognitive-based Risk Perception					
5	How probable do you think it is for yourself to be involved in a traffic crash					
6	I see myself as more How probable do you think it is for yourself to be injured in a traffic crash					
7	How probable do you think it is in general for persons to be involved in a traffic crash					
7	How probable do you think it is in general for persons to be injured in a traffic crash					
9	How concerned are you about traffic risks and are thinking that you yourself could be victimized					
10	How concerned are you about traffic risks and are thinking that others could be victimized					

D. Driver Behaviour

Rate on a six-point scale (1= never; 2=hardly ever; 3=occasionally; 4=quite often; 5=frequently; 6=nearly all the time) how often you experience specific types of aberrant driving behaviours

No.	Items	1	2	3	4	5	6
A.	Lapses						
1	Hit something when reversing that you had not previously seen						
2	Intending to drive to destination A, you “wake up” to find yourself on the road to destination B						
3	Get into the wrong lane approaching a roundabout or a junction						
4	Switch one thing, such as the headlights, when you meant to switch on something else, such as the wiper						
5	Attempt to drive away from the traffic lights in third gear						
6	Forget where you left your car in a car park						
7	Misread the signs and exit from a roundabout on the wrong road						
8	Realize that you have no clear recollection of the road along which you have just been travelling						
B.	Errors						
9	Queuing to turn left onto a main road, you pay such close attention to the main stream of traffic that you nearly hit the car in front of you						
10	Fail to notice that pedestrians are crossing when turning into a side street from a main road						
11	Fail to check your rear-view mirror before pulling out, changing lanes, etc.						
12	Brake too quickly on a slippery road or steer the wrong way in a skid						

13	On turning left nearly hit a cyclist who has come up on your inside						
14	Miss “Give Way” signs and narrowly avoid colliding with traffic having right of way						
15	Attempt to overtake someone that you had not noticed to be signalling a right turn						
16	Underestimate the speed of an oncoming vehicle when overtaking						
	“Ordinary” violations						
17	Pull out of a junction so far that the driver with right of way has to stop and let you out						
18	Disregard the speed limit on a residential road						
19	Stay in a motorway lane that you know will be closed ahead until the last minute before forcing your way into the other lane						
20	Overtake a slow driver on the inside						
21	Race away from traffic lights with the intention of beating the driver next to you						
22	Drive so close to the car in front that it would be difficult to stop in an emergency						
23	Cross a junction knowing that the traffic lights have already turned against you						
24	Disregard the speed limit on a motorway						
	Aggressive violations						
25	Sound your horn to indicate your annoyance to another road user						
26	Become angered by another driver and give chase with the intention of giving him/her a piece of your mind						
27	Become angered by a certain type of a driver and indicate your hostility by whatever means you can						

E. Personality Inventory

Here a number of statements that may or may not apply to you. Please tick in the column to indicate the extent to which you agree or disagree with the statement.

1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

ITEMS	1	2	3	4	5
1. Am the life of the party (I like attending parties)					
2. Sympathize with others' feelings					
3. Get chores done right away(I do not delay in getting thing done)					
4. Have frequent mood swings.					
5. Have a vivid imagination (I have a very good imagination)					
6. Don't talk a lot					
7. Am not interested in other people's problems					
8. Often forget to put things back in their proper place.					
9. Am relaxed most of the time					
10. Am not interested in abstract ideas (I don't like thinking about things I can't see)					
11. Talk to a lot of different people at parties					
12. Feel others' emotions.					
13. Like order. (I like things to be done right)					
14. Get upset easily.					
15. Have difficulty understanding abstract ideas. (I find it difficult understanding things I can't see or touch)					
16. Keep in the background (I don't like drawing attention to myself)					
17. Am not really interested in others					
18. Make a mess of things					
19. Seldom feel blue (I do not feel sad often)					
20. Do not have a good imagination					

END OF SURVEY THANK YOU FOR YOUR PARTICIPATION!!!

APPENDIX B

SCREE PLOTS FOR FACTOR ANALYSIS

I. Risk Perception Scale

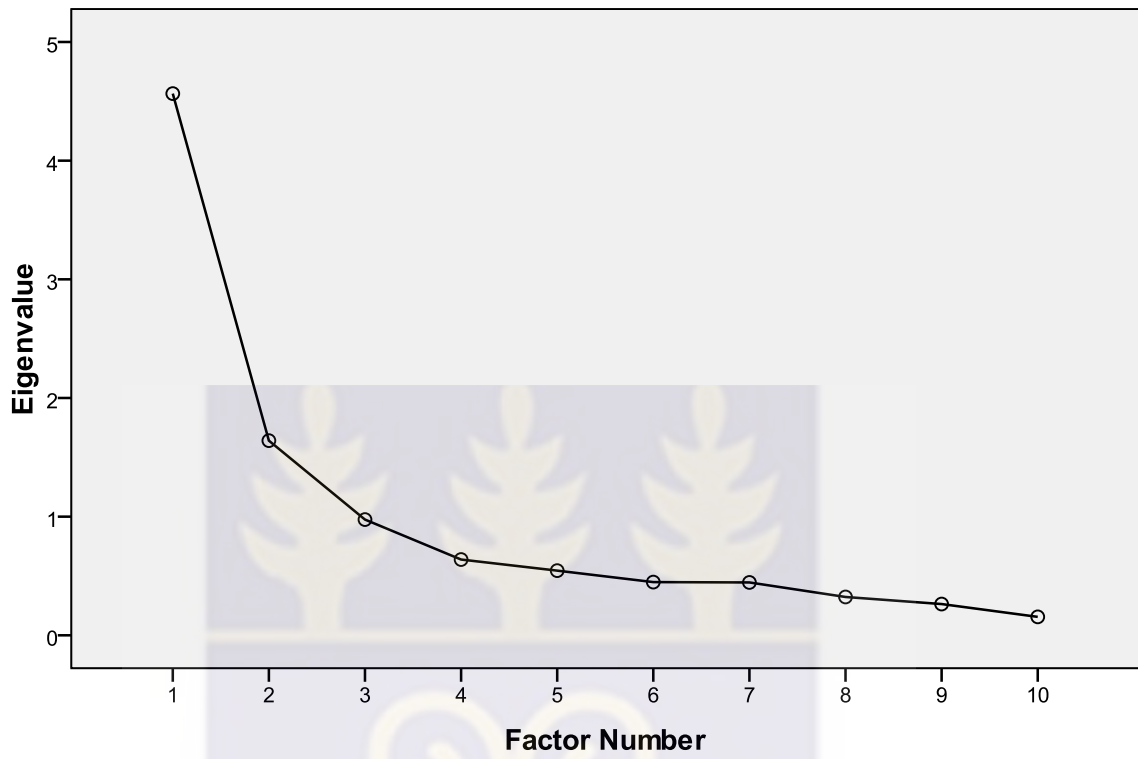


Communalities

	Initial	Extraction
Feeling unsafe that you yourself could be injured in a traffic crash	.633	.656
Worried for yourself being injured in a traffic crash	.741	.837
Feeling unsafe that person's could be injured	.715	.789
Worried for persons being injured in traffic crash	.432	.446
I think it is very probable for me to be involved in a traffic crash	.582	.581
I see myself as more How probable do you think it is for yourself to be injured in a traffic crash	.400	.334
It is very probable for drivers in general to be involved in a traffic crash	.385	.360
It is very easy for people to be injured in a traffic crash	.584	.682
How concerned are you about traffic risks and are thinking that you yourself could be victimized	.383	.439
How concerned are you about traffic risks and are thinking that others could be victimized	.326	.284

Extraction Method: Principal Axis Factoring.

Scree Plot



II. Driver Behaviour Questionnaire



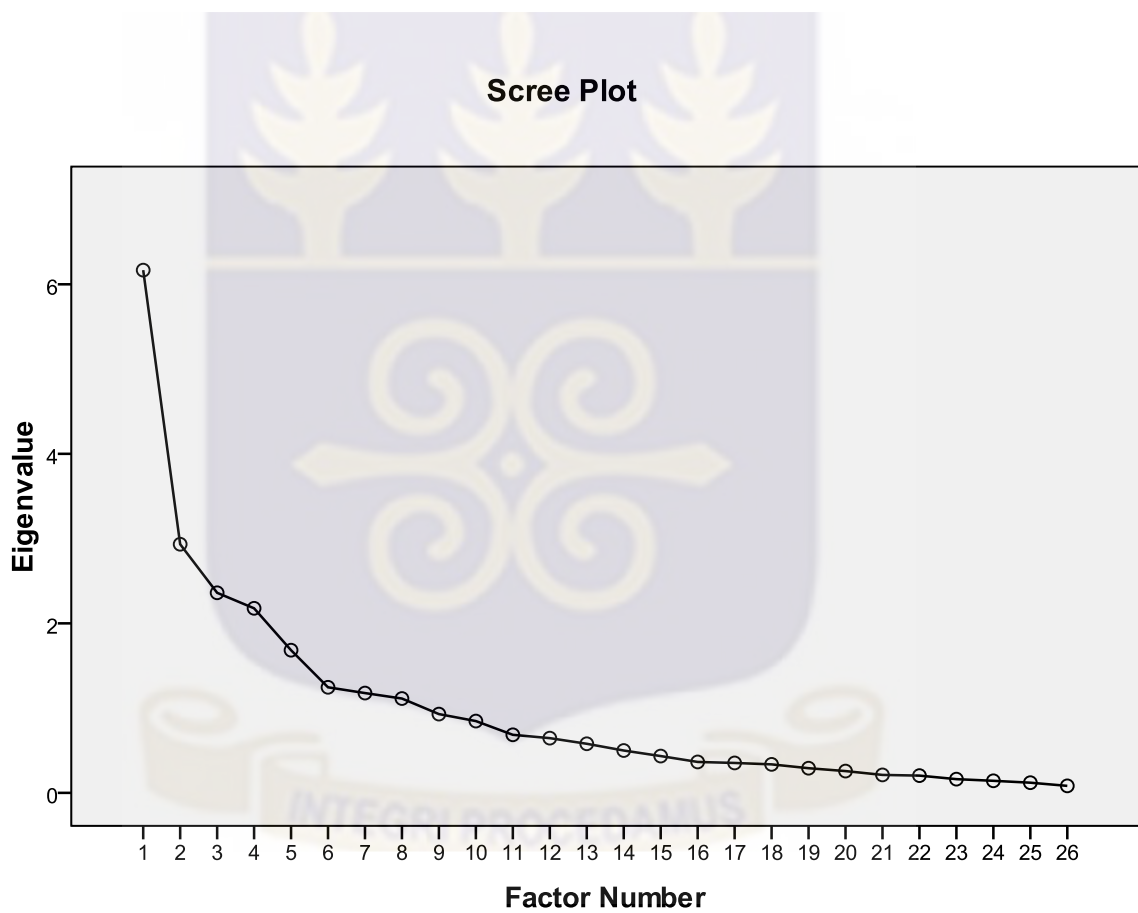
Communalities

	Initial	Extraction
Hit something when reversing that you had not previously seen	.533	.450
Intending to drive to destination A, you “wake up” to find yourself on the road to destination B	.645	.592
Get into the wrong lane approaching a roundabout or a junction	.774	.779
Switch one thing, such as the headlights, when you meant to switch on something else, such as the wiper	.678	.490
Attempt to drive away from the traffic lights in third gear	.670	.444
Forget where you left your car in a car park	.682	.497
Misread the signs and exit from a roundabout on the wrong road	.634	.379
Realize that you have no clear recollection of the road along which you have just been travelling	.633	.387
Queuing to turn left onto a main road, you pay such close attention to the main stream of traffic that you nearly hit the car in front of you	.581	.340
Fail to notice that pedestrians are crossing when turning into a side street from a main road	.586	.381
Fail to check your rear-view mirror before pulling out, changing lanes, etc.	.522	.381

Brake too quickly on a slippery road or steer the wrong way in a skid	.623	.462
On turning left nearly hit a cyclist who has come up on your inside	.598	.600
Miss "Give Way" signs and narrowly avoid colliding with traffic having right of way	.796	.779
Attempt to overtake someone that you had not noticed to be signalling a right turn	.639	.508
Pull out of a junction so far that the driver with right of way has to stop and let you out	.506	.324
Disregard the speed limit on a residential road	.648	.369
Stay in a motorway lane that you know will be closed ahead until the last minute before forcing your way into the other lane	.736	.651
Overtake a slow driver on the inside	.561	.400
Race away from traffic lights with the intention of beating the driver next to you	.676	.745
Drive so close to the car in front that it would be difficult to stop in an emergency	.635	.523
Cross a junction knowing that the traffic lights have already turned against you	.502	.469
Disregard the speed limit on a motorway	.521	.372
Sound your horn to indicate your annoyance to another road user	.525	.347

Become angered by another driver and give chase with the intention of giving him/her a piece of your mind	.771	.648
Become angered by a certain type of a driver and indicate your hostility by whatever means you can	.740	.661

Extraction Method: Principal Axis Factoring.



III. Personality Factors

Communalities

	Initial
Sympathize with others' feelings	.666
Get chores done right away(I do not delay in getting thing done)	.677
Have frequent mood swings.	.529
Have a vivid imagination (I have a very good imagination)	.664
Don't talk a lot	.663
Am not interested in other people's problems	.633
Often forget to put things back in their proper place.	.638
Am relaxed most of the time	.539
Am not interested in abstract ideas (I don't like thinking about things I can't see)	.376
Feel others' emotions.	.588
Like order. (I like things to be done right)	.498
Get upset easily.	.738
Have difficulty understanding abstract ideas. (I find it difficult understanding things I can't see or touch)	.359
Keep in the background (I don't like drawing attention to myself)	.636
Am not really interested in others	.526
Make a mess of things	.626
Seldom feel blue (I do not feel sad often)	.813
Do not have a good imagination	.665

Extraction Method: Principal Axis Factoring.

Scree Plot

