

# Driver Behavior as Predictor of Collision Risk using Ordered Probit Approach



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*Dedicated to my exceptional parents and adored siblings whose  
tremendous support and cooperation led me to this wonderful  
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## **Abstract**

Increasing travel demand during the last decades has eventually increased the vehicle miles traveled (VMT) and motorization by road users, which increased the percentage of road traffic crashes (RTCs). Human factors are the most dominant factors causing highest percentage of RTCs across the globe. Among human factors, drivers' faults are the most perilous ones because commencing slight mistakes by the drivers can be disastrous for all of the occupants and road users. Pakistan being a developing country suffers a huge social and economic loss each year in the form of road traffic mortalities and injuries. Also, most of the drivers' population in the country is uneducated or low educated which worsens the situations. This study focuses on the investigation of factors affecting the involvement of drivers in RTCs. Because of ordinal nature of response variable i.e. accident involvement, an ordered probit model is extensively used. The estimation results predicted that drivers' age, driving experience, hitting back object during reverse motion, reduce speed on wet or slippery roads and use of cell phone or Bluetooth during driving significantly affect the involvement of drivers in road crashes. The authors believe that the outcomes of this study will evolve a primary understanding of the transportation and traffic enforcement agencies in identifying risk factors of drivers regarding accident involvement and thus will mitigate the hazardous situation in the country.

**Key Words:** *Driver Behavior Questionnaire, Road Traffic Crashes, Ordered Probit Model*

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## **INTRODUCTION**

### **1.1 Background**

Increasing population has consequently augmented the travel demand and emanated to more vehicle miles traveled (VMT) by road users. The increased motorization on roads has increased the percentage of road traffic crashes (RTCs). Over one million people lose their lives and over 50 million people bear non-fatal injuries each year across the globe (WHO, 2015). According to (Gore *et al.*, 2011), RTCs is the key source of fatality among young people having age between 15 to 19 years. 90% of the overall road traffic fatalities (RTFs) are endured by low and middle income countries whereas only 54% of the total registered vehicles belong to these countries (WHO, 2015). Road safety has become a demanding issue worldwide and if no precautionary and preventive actions are taken to prevent RTCs it would become the 7<sup>th</sup> leading cause of fatality by 2030 (Toroyan, Peden and Iaych, 2013). RTCs also put burden on the states' economy. National Highway Traffic Safety Administration (NHTSA) states that the total reported economic loss due to RTCs in 2000 was about US \$ 242 billion (Dula, 2012). Due to enormous health and economic losses, it becomes essential to investigate the factors that effects behaviors, emotions and cognitive processes specifically related to drivers causing RTCs. In the past decades, researchers focused on avoiding risky driving that include driving without safety precautions such as not wearing seat belt or drunk-driving (Little *et al.*, 1994; Young *et al.*, 2008) . (Peden *et al.*, 2004) estimated that less-privileged socio-economic groups are vulnerable to RTCs due to their more exposure. RTIs push many families intensely into scarcity of wealth by the decease of their wage earner and impose a

enormous constant burden on the families of victims and on health management structure of counties. Road crashes are representation of the lack of safety of road transport system which is an important performance measure for the quality of road transportation system. Various factors are reported to cause RTCs including roadway characteristics, vehicle and human factors. Studies predicted human factors as the leading cause of RTCs causing highest percentage of crashes (Christ *et al.*, 2004) . In developing countries like Pakistan, human fault is identified as the major cause in almost 70% of RTCs (Jacobs *et al.*, 1984; Jacobs *et al.*, 1981). RTCs are caused by various factors describing the erroneous state of a system including the defective components which can be either human or technical and the flawed interactions of the respective components. Usually the problem originates because of interaction of human components and other components of the system. Therefore, human factors related to RTCs refers to incompetence of the variable characterizing the human components comprising on experience of driver, driver's inattention and their level of fatigue combine with the inadequate roadway components such as road layout and vehicle environment cope in particular situation to cause human faults (Van Elslande *et al.*, 2008). Pakistan is a developing country having a population of 188.92 Million populations in 2015 (Bank, 2015). According Pakistan bureau of Statistics total registered vehicles in Pakistan during 2015 were 9,080,437 Global Status Report on Road Traffic Accidents (WHO, 2015). WHO estimated 25,781 road traffic fatalities in Pakistan (WHO, 2015). Despite of such enormous traffic accidents Pakistan falls a way behind best practices regarding road safety according to Global Status report on road safety found 5 risk factors that cause road traffic fatalities (RTFs) and their best legislation practices and unfortunately Pakistan had no best legislation practices regarding any of the risk factor (WHO, 2015) .Global status report on road safety ranked enforcement of seat belt law in

Pakistan on 3 on 10 point scale whereas helmet law enforcement was ranked on 2 on 10 point scale (WHO, 2015)

The present study focuses on exploring the drivers' involvement in RTCs in Pakistan and their associated factors. In addition, the impacts of driver age, experience and actions on the response variable are investigated. The chapter of literature review explains various research efforts carried out to investigate the drivers' behavior and their involvement in RTCs. Data description part provides information on data collection for this study whereas methodology explains the selection of appropriate statistical technique for this study. In results and discussion, the impacts of the statistical significant variables are explained along with their marginal effects. In the end, conclusions and recommendations are provided in order to suggest counter measures for enhancing the road safety situation by controlling driver related factors in the country. The authors believe that the outcomes of this study would help the transportation and enforcement agencies to control various factors related to drivers to overcome their frequent involvement in RTCs.

## **1.2 Problem Statement**

Millions of peoples lose their lives and endure non-fatal injuries due to RTCs. Apart from such huge loss of health loss it also comprises financial loss to country's health care system. It is essential to investigate the causative factors of RTCs particularly in developing countries because less efforts have been carried out in developing for road safety research. And literature agrees that rationale for RTCs is Human factor and about 95% of the road crashes are due to human fault so it become evident to investigate motivational factors that what tend drivers to be involved in road traffic crashes. This study investigates driving behavior in the involvement of RTCs and to suggest the remedial measure to ensure safety.

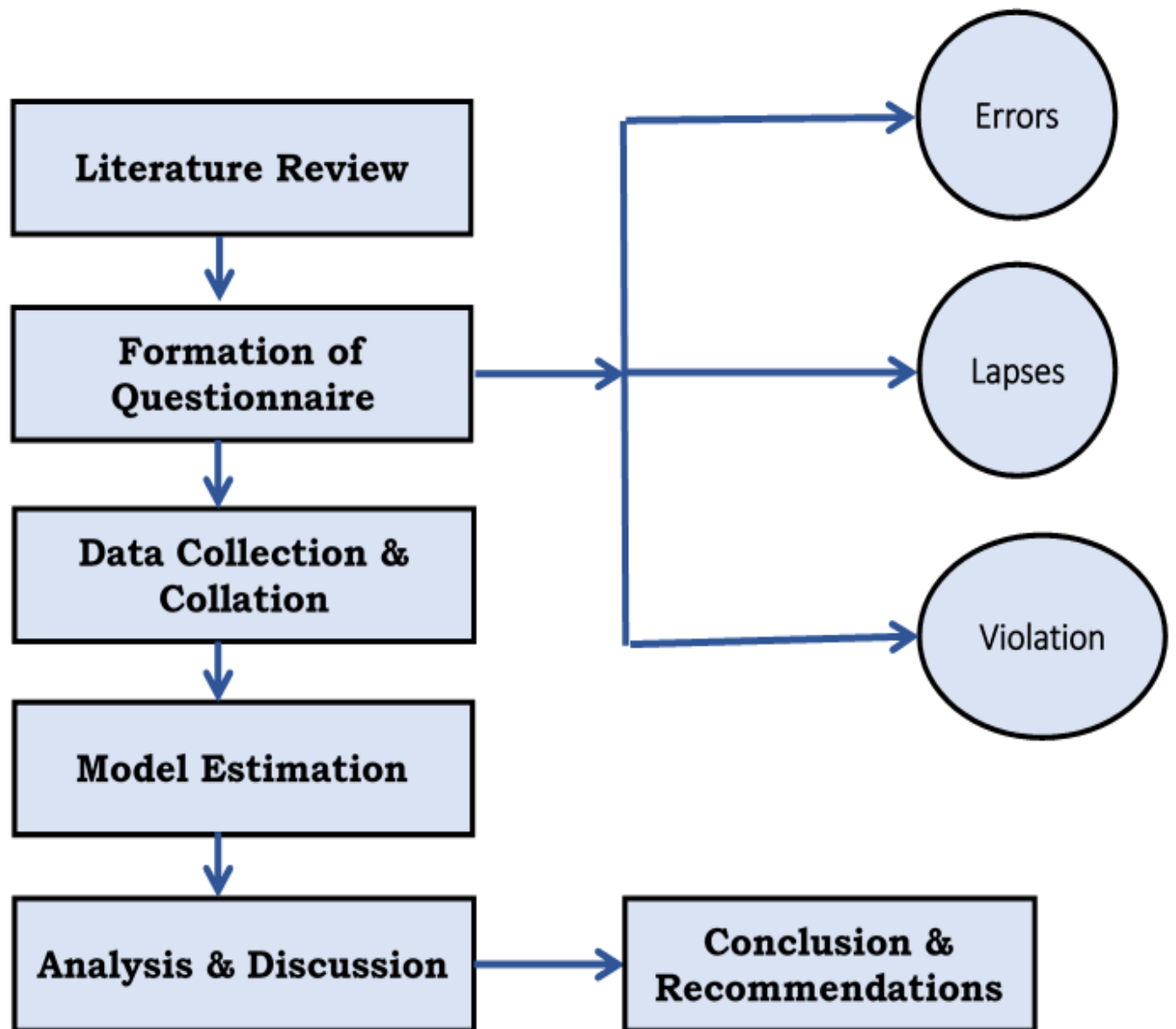
### **1.3 Overview of Study Approach**

Developed a detailed methodology to achieve successfully the desired objectives, the methodology comprises of the following tasks.

- ⇒ A comprehensive study of previous researches on the Driving Behavior
- ⇒ Formation of Questionnaire
- ⇒ Data collection through field interviews
- ⇒ Study various statistical approaches and appropriate model was selected
- ⇒ Estimation of Ordered Probit Model to establish correlation between driving behavior and collision risk
- ⇒ Model Estimation and results
- ⇒ Conclusion and Recommendations

### **1.4 Organization of Thesis**

Thesis comprises of 6 chapters. Chapter 01 provides brief overview of the problem and its consequences regarding RTCs Chapter 02 provides brief review of past researches regarding driving behavior Chapter 03 discuss the formation of questionnaire and data collection Chapter 04 describes the modeling techniques and modelling methodology Chapter 05 discuss the model results Chapter 06 conclusion and recommendations.



*Figure 1.1 Research methodology*

## **LITERATURE REVIEW**

### **2.1 Introduction**

Road infrastructure comprises of three components including vehicles, road environment and road users. During various circumstances, the interaction between these components leads to RTCs (Panou *et al.*, 2007). Numerous studies were carried out to explore the causative factors in RTCs and human fault was estimated as the dominant reason (Evans, 1996; Iversen *et al.*, 2004; Parker *et al.*, 1995a). (Singh, 2015) described that according to National Highway Traffic Safety Association of America (NTHSA), 95% of the RTCs occur due to human errors. According to past literature, primary sources of RTCs include risky driving, over-speeding, ignoring use of safety restraints and increase traffic volumes on the section. Reducing risky driving can curtail the chances of crashes and injuries on road. That's why extensive research efforts were carried out to understand the aberrant driving behavior which provide better insight to investigate the reasons and enhance the road safety (Elliott *et al.*, 2002). Among human factors, as reported by (Evans, 1996), driver behavior like what driver does has much more prominent impact on safety than driver's execution like what driver can perform. (Evans, 1991) suggested that improving road users behavior can enhance overall road safety on road networks. It is therefore, important to figure out the human factor and its association to RTCs especially in the developing countries in order to reduce risk and improve safety on the roads.

While understanding the driver's behavior, traffic psychology focuses on various aspects of driving behavior (Lenné *et al.*, 2004) which includes the following:

- Condition of driver i.e. excitement, tension, fatigue etc.
- Driver's differences
- Literacy
- Driver's training
- Public awareness efforts
- Implementation of traffic laws
- Rehabilitation of drivers
- Road and automobile design

There are various bases for classification of drivers' involvement in RTCs, which include gender, driving experience, social and professional status. The unusual driving behavior may be temporary status such as psychological and physiological factors like mood, stress, fatigue and other more lasting cognitive attitudinal and impetuous factors (Maycock, 1997). A developing frame of thoughts in road safety research emphasizes the necessity of changing attitudes and beliefs of drivers to improve and encourage the safety culture (Glendon, 2007; Lajunen *et al.*, 2004).

The previous chapter of this study highlighted the importance of safe driving practices in preventing RTCs. This chapter discusses various research efforts carried out to understand the drivers behavior and factors affecting the involvement of drivers in RTCs. (J. Reason *et al.*, 1990) first developed driving behavior questionnaire and categorized errors, lapses, mistakes and violations as aberrant behaviors. These categories are explained as

## **2.2 Errors**

According to (J. Reason *et al.*, 1990) stated that errors can be defined as the wrong plan failed to achieve its desired objectives. To find the roots of basic human errors types, a Generic Error Modelling System (GEMS) was established. The model furnishes the following operative explanations: error will be adopted as general term to include all those likelihoods in which intentional system of mental or physical activities not able to reach its desired results (J. Reason *et al.*, 1990).

## **2.3 Slips**

Slips are termed as most frequent type of human fault and are classified as those errors whose intentions were correct but their execution went wrong. In driving background, an instance of slip is when driver tries to pedal the brake to slowdown but accidentally press the throttle pedal, or when a driver aiming to switch on side indicators but accidently activates the wipers. In such cases the purpose was exact but implementation went wrong (Salmon *et al.*, 2005)

## **2.4 Lapses**

Lapses mostly comprise of a failure to accomplish a planned action or forget the next action in a specific succession required. While slip based errors are apparent errors including inappropriate execution of correct plan, lapses are further unseen types of error that include a fiasco of memory, it may not be reelected in real driving behavior (J. Reason *et al.*, 1990). For instances driver fail to remember shutting of the lights while leaving car, even when intentions was not to do so and be unable to remember locking vehicles while they wanted to do so (Salmon *et al.*, 2005)



## 2.5 Mistakes

Mistakes are formed by the driver's imperceptible plans and intentions. They are classified as improper intention or execution of wrong decisions, and occur when a driver performs an erroneous action and this initiates at planning stage. Example of mistakes include when a driver decides to fasten his car whereas the suitable action would be to pedal the brake or deaccelerate. According to (J. Reason *et al.*, 1990), mistakes contain a incongruity among the preceding intention and the intended results and probably to be more subtle, more intricate , less well tacit, and hard to notice than slips (Salmon *et al.*, 2005)

## 2.6 Violations

Violations are defined as intentional breaches of certain regulatory or socially recognized codes (Parker *et al.*, 1992). Also, it is defined as violations are intentional but not necessarily guilty of deviations from these practices appear to be important to continue the safe conduct of possibly dangerous system (J. Reason *et al.*, 1990). Distinct to errors those are related to understanding behavior of drivers., violations are more complex as it requires extra clarification of motivational factors that causes drivers to violate traffic rules and their social background in which behaviors are governed, their codes of performs, standards and specification like this (J. Reason *et al.*, 1990). Whereas strong case is with the direct association between behavioral characteristics and collision risk with driving violations (Parker *et al.*, 1995a; T. Reason, 1991). Such behaviors like disregarding red lights to pursuit another driver is illegal because it is hazardous. According to (Parker *et al.*, 1992) it is evident that disregarding traffic laws and regulations increases provability in accident involvement. There is enough proof that drivers who reported that they are more likely to commit violations pondered possible negative impacts of such violations, and to feel that such

behavior is less under intended control. In addition, these drivers show evidence of false consensus bias about the number of road user involved in violations (Parker *et al.*, 1995b).

Various studies considered acts including speeding, drunk-driving and non-use of seat belts to be particularly dangerous set of violations (Parker *et al.*, 1995a; J. Reason *et al.*, 1990; Stradling *et al.*, 2000). These factors are discussed as follows;

## **2.7 Speed**

Speed is considered as a significant factor of road safety. It influences both the severity and associated risk of being involved in RTCs (Elvik *et al.*, 2004). According to (Aarts *et al.*, 2006), chances of RTCs increases with the increase in speed. It makes a major contribution to road trauma (Hatfield *et al.*, 2008). Various independent studies predicted positively association of speed and number of RTCs (Hatfield *et al.*, 2008; West *et al.*, 1997). Similarly, the severity of RTCs increases with over speeding (Laapotti *et al.*, 2001; Moore *et al.*, 1995; Peden *et al.*, 2004). According to (Elvik *et al.*, 2004), the number of RTCs increases with increase in speed of vehicles. As speed decreases number of RTCs reduces almost for 95% of the cases and when speed increases so, the number of RTCs increased in about 71% of the cases. While it may be possible to some extent reduce impact of higher speed by the introduction of road safety measure, reduced speed almost always enhances safety. At higher speed chances of crashes increases due to multiple reason such as driver losing control over the vehicle, failing to anticipate oncoming hazards in good time and the vehicle taking more time to stop at higher speed. There is also a close association between speeding and other types of violations and therefore, drivers involved in speeding are also found to be involved comparatively more in other types of violations (J. C. de Winter *et al.*, 2007). A study on the intention to speed on the motorway further elucidates that constant speeders don't

miscalculate the hazard, but take the risk intentionally after making fair judgement about the speed that can be achieved on particular road (Iversen & Rundmo, 2004).

## **2.8 Seatbelt**

Use of seat belt significantly contributes to reduce the road traffic fatalities and injuries (RTIs). (Peden *et al.*, 2004) suggested that non-use of seat belt doubles the risk of serious and fatal injuries. They suggested that seat belt usage contribute 40% to 65% reduction of fatalities and 43% to 55% reduction in moderate and severe injuries.

## **2.9 Distracted Driving**

Distraction of drivers is considered as the most dangerous risk factors for RTCs. Distraction can occur due to use of cellphone, talking to other occupants, eating something and texting during driving etc. However, texting via cell phone during driving is considered as the most dangerous action as it includes all three types of distractions like leaving wheel i.e. manual, taking away eyes from the roadway ahead i.e. visual and taking mind off the driving i.e. cognitive. RTCs due to distractions most likely occur when any unexpected events like wet road, encroaching vehicle etc. occur. With changing situations, along with unplanned activates around drivers makes it nearly impossible to relate any secondary task with specific degrees of crash risk (Ranney *et al.*, 2000).

## **2.10 Emotional Factors**

Emotional and personality factors such as anger, aggressiveness and impulsiveness influence driving behavior are related to an increase in road rage, risk taking and RTCs-related variables (Donovan *et al.*, 1985) Rage driving usually results risky driving, combative driving and loss of vehicular control, so individual's diversity to experience anger during driving come out to be an essential predictor of driving behavior and outcomes related to RTCs(Dahlen *et al.*, 2006).

As Pakistan is among the developing countries facing adverse road safety problems so extensive research is required in every aspect regarding road safety and driving behavior is one of the aspect. As road crashes are particularly due to interaction of vehicle, road environment and road users. Facts and figures emphasizes the need for research in every aspect of road safety in Pakistan but specifically with reference to driving behavior. For instance, a cross-sectional study conducted by (Shah *et al.*, 2007) Population in the province of Sindh indicates no correlation with total Road Traffic Crashes (RTC) and motorization, number of motor vehicles, loss of life in RTCs, rate of road traffic casualties and death ratio to RTC. This recommend that motorization level or population is not the root cause of causes of RTCs and there might be several other factors influencing Road crashes such as driver behavior and behavior other road users, and the reasons of fatal crashes in Pakistan are due to environmental and human factors. Therefore, this research examines pre-crash phenomenon, focusing on human factors in accidents. It attempts to understand the underlying factors which results in poor driving behavior in the country with the help of traffic psychology. While taking into account sociological and physiological factors, many researchers including (Underwood *et al.*, 1997) have studied particular factors, in relation to their association with a driver's accident liability in road safety. These factors include

- a. Propensity to commit driving errors and violations
- b. Attitudes of the driver towards both their own and other road user's driving
- c. Attitude of the driver towards the vehicle they drive
- d. Actual driving behavior observed on the road such as speed limit observation and overtaking judgements
- e. General personality variables such as mild social deviance and decision making thoroughness

This thesis investigates most of these factors (a,b,c,d) in the context of Pakistan, it attempts to identify key psychological predictors of aberrant behavior by deploying various methods and techniques including self-reported questionnaire studies and direct observation of driving behavior. Driving Behavior Questionnaire survey is carried out in order to measure the behavior of different drivers and their likely chances of involvement in crashes, because every driver has his own perceptions about road, other road users and every driver behaves in a different manner to same situation.

## **2.11 Determinants of Aberrant Driving Behavior**

The role of the human factor problem in accident causation is evident from the discussion so far. From the evidence, available on road safety research it is obvious that a number of causal factors (which can be internal or external) can potentially impact on the behavior of drivers either in isolation or combination.

## **2.12 Attitudinal and Motivational Factors**

Since the violations are strong and consistent predictor of road accidents, it is therefore important to understand that what encourages drivers to commit violations which results in potential danger to themselves as well as to other peoples in surrounding, this problem led researchers to consider at many different aspects of behavior including attitudes (Forward, 2006). Attitudes guide behavior whether through intentional or instinctive process, the previous behavior activated by substantial motivation and the chance to involve in intentional activation of the latter rely on accessibility (Ajzen, 2001; Crano *et al.*, 2006). However, these are different definitions of attitudes, it can be explained as “ the action or decision to prepare a person to act in certain hypothetically psychological way (Delaney *et al.*, 2004)

According to (Parker *et al.*, 2004) attitudes can be defined as “ notion and emotions that include human to behave in certain way and not in other way” it’s been observed in previous years that the importance of social influence has increased and also the need of remedial measures increased to focus over attitudes and motivation instead on expertise. It was noted that road traffic offenses is social phenomenon, with greater incentive component and the need to change attitudes to prevent violations rather than programing training or retraining which is less effective in reducing offending behaviors (Parker *et al.*, 1995a)

(Summala, 1996) stated that drivers in traffic stream desires to maintain the speed by looking for sufficient gaps in traffic. Since to change unsafe driving practices and to promote safe ones different road traffic safety programs and messages are designed. (Eby *et al.*, 1998) concluded that it is necessary to determine motive behind unsafe practices before designing appropriate message and programs for traffic safety. (Hennessy *et al.*, 2005) further cited that driving behavior not only involves technical skills to operate, but also it can depict personal expression and individuality locale for many drivers. Thus behavior of driver is considered as reflection of their personality and it reflects their attitudes and motivations. As result bad attitudes are reflected in bad driving and it cause potential danger (Stradling & Meadows, 2000). (Parker *et al.*, 1992) concluded that unwanted attitudes and convictions lead drivers to engage in driving offenses.

(Parker & Malone, 2004) suggests that, if motivation is part of the road safety problem which tempts drivers to do risky things behind the wheel, a solution should be to persuade them not to do so. She concludes that the best way to affect long-lasting change in behavior requires a change in beliefs, values and attitudes that underpin the decision to behave in that way. In concordance, (Iversen & Rundmo, 2004) mention that attitudes to traffic safety are related with the participation in risky behavior, particularly attitudes regarding rule-violations, speeding and irresponsible

driving. They cite a meta-analysis resulting of 88 attitudes and behavior studies conducted by (Kraus, 1995)The analysis concludes that attitudes are a important and considerable predictor of future behavior. It is found that attitudes and behavior are extremely associated when measured at conforming levels of especially; i.e. attitude and behavior corresponded in their goal and action elements. The researchers postulate that, as attitudes are expected to employ direct impact on the traffic behavior, subsequently altering attitudes represents a possible method of carrying about behavioral change for that, it is first significant to understand the formation of attitudes of driver's formation of attitudes of drivers

## **2.12 Influence of Socio-Economic and Demographic Characteristics**

The literature argues that road safety is social problem and that personal factors play a vital role in guiding and shaping driver behavior. Research in the psychological sciences has found a close association between driver behavior and an individual and an individual's socio-economic and demographic characteristics. Variables such as age, gender and exposure are all known to be correlated with accident involvement (Iversen & Rundmo, 2004; Rothengatter, 1997; WARD *et al.*, 2003). For example, it has been noted that a high rate Road Traffic Violations are significantly associated with young, male drivers who have high annual mileage i.e. exposure (Hennessy & Wiesenthal, 2005; Parker *et al.*, 1995)

## **2.13 Treatment of Aberrant Driving Behavior – Road Safety Interventions**

So far, we have focused on types and causes of aberrant driving behaviors, now we look for the potential ways to improve these behaviors. In this regard, the work of William Haddon is prominent. He was the first head of the US Federal National Highway Traffic Safety

Administration and a public health physician, who has contributed considerably to the understanding of injury occurrence (Lett *et al.*, 2002) and its control.

Rationally traffic safety can be improved by providing Education ( driving training), through information related to traffic safety by media campaigns, through law practice, law enforcement (strict implementation of speed and traffic signal rules), transportation planning ( organizing road network) and traffic engineering measures (improved geometric design of road and intersections). (Almqvist *et al.*, 1994)

These factors aggregately make the driving unsafe not only for the driver himself but for the others i.e. car occupants, pedestrians, other road users and road side elements. In order to make driving a safer practice a driving behavior study is to be carried out to call attention of different stakeholders to ensure safety. The above discussion has demonstrated the need for extensive research in developing countries particularly in Pakistan which could lead to common understanding of the country's specific issues, and could contribute to road safety policies.

The review has highlighted that intentional Road Traffic Violations are the riskiest type of aberrant driving behavior. They are mediated by the attitudinal and motivational factors and make a significant contribution to the accident toll on the roads. Various social cognition models have been utilized in road safety research to theoretically explains the underlying psychological mechanism involve in commissions of violations.

The review also concludes that although attitudes are generally recognized as the most relevant for understanding and predicting driver behavior, there are many other factors which can influence it. For instance, situational and cultural factors, level if enforcement as well as demographic and socio economic characteristics of drivers are found to be associated with the frequency that violations are committed. In order to prevent these deviant driving practices, person based or system based



road safety measures are usually developed. The review concludes that these approaches can achieve much more effective results when used in combination, particularly in case of developing countries. The key points drawn from the review are

- Intentional violations are highly risky type of aberrant behavior that pose a definite risk to other road users and can lead to serious RTAs
- This deviant behavior has strong attitudinal and motivational components and change in attitudes is required to bring about a change in behavior
- Socio-economic and demographic characteristics of drivers influence commission of violations so as the driving environment
- To prevent commission of violations, road safety interventions should be developed using both person and system based approaches

Surveys and questionnaires are often carried out to study driving behavior based on self –reported accidents. There are many advantages of carrying questionnaire studies like low cost and data can be collected and analyzed over a short span of time. Many national and international studies being carried out because of competency and low costs of acquiring representative driving samples of self-reports. Inclusion of the above benefits, questionnaires gives a mean to study drivers behavior, that can be difficult or near to impossible to inquire by other means such as observations, studying national accidents statistics and interviews

DBQ is important because it has enhanced the understanding of the links among the behavioral attributes of drivers and their risk of involvement in accidents and allows to focus on remedial measures to promote road safety. (J. Reason *et al.*, 1990) developed the DBQ in order measure driving behaviors with almost 50 items to measure lapses, errors and violations. Ever since, it

become one of the broadly used tool for measuring both driving style(Bener *et al.*, 2006) and the correlation between driving behavior and crash involvement (J. De Winter *et al.*, 2010).

The DBQ originally classify unusual driver behavior into three empirically distinct categories: lapses, errors and violations (J. Reason *et al.*, 1990).behaviors such Memory loss and inattention to road are comparatively harmless and are termed as lapses ( e.g forgot where the car was parked in parking lot) and elderly and female drivers are more often engage in lapses(Parker *et al.*, 1998) dissimilar to lapses, errors are probably more dangerous driving mistakes such as miscalculations or observation failures (e.g. disregard the speed of encroaching vehicles) with regard to past research, no any specific demographic group is linked with errors (Parker *et al.*, 1998). Deliberate deviations from safe driving practices are termed as violations. Behaviors such as over speeding, disobedience of traffic laws and tailgating are termed as violations. Youngster and male drivers are reported as more often found to be engage in violations. Later violations were sub divided into aggressive and ordinary violations. (Parker *et al.*, 1998). Violations like showing annoyance by mean of sounding horn was termed as aggressive violations while as traffic violation or risky driving without any act of aggression were termed as ordinary violations. Driving behavior study as self-reported has many advantages over other researches in traffic behavior.

In developing countries, there is rapid expansion in transport sector and construction sector whereas a little effort is carried out in order to prevent road crashes or reducing their severity (Almqvist & Hydén, 1994). Unlike the developed world where extensive research and technological innovation, a vivid safety culture, and successful law enforcement have generally reduced causalities and road accidents. There is an impressive body of studies demonstrating causes and effects of accidents per se but are relatively few relating to developing countries. The scarcity of road safety research activities in developing countries has also been emphasized by

(Downing, 1991). In the Asian Pacific region, apart from a few notable exceptions, relatively little research has been undertaken by the various countries (ADB, 1998). To add, motorization is increasing dramatically in many Asian countries. As a result, road accident numbers are bound to increase and the need for road safety research will become stronger. Concurrently, measures that have been successful in developed countries may not always be as successful in the developing world (ADB, 1998). Findings of road safety research in developed countries may not be transferable to the developing country context, as profiles of developed and developing countries widely differ in terms of culture, resources, road and traffic conditions, Socioeconomic levels and in behavior, attitudes and knowledge of road users. Consequently, as said by (Baguley, 2000) developing and developed countries have different social and cultural norms so it's not appropriate to transfer the policies and solutions of developed countries to developing countries because each country has its set conditions and problems. Therefore, examine how scant is understood about the validity of local safety measures, especially the generalization of results for various countries and their traffic cultures. It is proposed by (Almqvist & Hydén, 1994) that key researchers from countries with comparably higher safety standards and measures should contribute evaluate and assess such safety measures for example, investigations in Pakistan (Downing, 1991) results that about (15%) of drivers in Pakistan continues crossing "no-overtaking" lines and about (52%) of drivers were not stopping at stop sign even when traffic was near. Despite of relationship among the differences in behaviors and accidents were not determined, it was suggested by the results that safety measures those were not self-enforcing as road signs and markings, drivers pay less attention to them hence are less effective except combined with publicity and enforcement campaigns. Its recommended by (Bener *et al.*, 2006) that policies that are popularized in developed world to tackle specific accident related factors can be transferred to developing world to prevent the extent

of Road traffic accidents. However, if planners want to influence the driver behavior they should understand that successful policies and media campaigns are culturally distinct and the psychological factors of individuals based within a specific cultural setting must be understood. Hence, it is imperative to carry out research and evaluation studies, which accommodate country specific conditions and suggest relevant interventions accordingly. In the case of Pakistan much less is known about driver behavior, although drivers are held responsible for the majority of RTAs. However, the underlying factors which precede the deviant behaviors are not scientifically assessed for the country. The lack of such understanding is attributable to the difficulty of designing and implementing behavior changing interventions in Pakistan. Over the years, it has been established that changes in driver behavior offer the largest opportunities for harm reduction. This also exacerbates the difficulties in achieving sustainable results through on-going road safety campaigns and projects at local levels. (Batool *et al.*, 2012) In the light of above mentioned examples, it is evident that Road Traffic Violations significantly contribute to accident causation and if driver stop prating these unsafe acts and comply with the road traffic rules and regulations much can be achieved that is beneficial for the road safety. Therefore, this research is carried out minimize the violations hence reduction in road traffic accidents.

### FORMATION OF QUESTIONNAIRE

#### 3.1 Background

Driving behavior questionnaire was first developed by (J. Reason *et al.*, 1990) describing aberrant behavior into three distinguishable categories that are Errors, Lapses and Violations and after that (af Wåhlberg *et al.*, 2011) rectified the driving behavior questionnaire and Developed Manchester Driving behavior questionnaire and carried out study to determine the correlation of driving behavior with accident involvement. In this study questionnaire was adopted from Manchester Driving Behavior Questionnaire and was tailored according to Pakistan's Context. Questionnaire consisted of Four Section. 1<sup>st</sup> section was about the demographic information about the drivers age, driving experience, education level, gender, previous involvement in road traffic crashes and on their previous driving experience and driving habits what are their likelihood to be involved in road traffic crash. 2<sup>nd</sup> section of the questionnaire comprised of the violation that how often do you disregard the use of seat belt while or crossing the intersection while traffic light turned red or overtake slow moving vehicle from wrong side (i.e. Left side). 3<sup>rd</sup> section of the questionnaire was comprised on Errors that how often you forgot to see rearview mirror before changing lane or pulling out or hitting vehicle while backing up. And 4<sup>th</sup> section of the questionnaire encompasses the lapses that how often do you forgot your headlights on high beam on two-way road or fail to give right of way to overtaking vehicle. Questionnaire was translated into Urdu so that people how doesn't know English can answer the questionnaire.

Driver Behavior questionnaire (DBQ) has found that aberrant driving behaviors can be categorized as;

- **Errors**
- **Lapses**
- **Violations**

Lapses involve problems with attention and memory and include such things as having no clear recollection of the road you have just travelled on. Errors are type of driving mistakes involving failures of observation and misjudgment, and include such behaviors as breaking too quickly on a slippery road. Violations are deliberate deviations from those practices believed to be necessary to safely operate a vehicle and include such behaviors as speeding and tailgating.

### **3.2 Data Collection**

Road safety is a serious concern in developed as well as developing countries, annually about one million peoples lose their lives due to road crashes and millions of peoples endure non-fatal injuries. Different initiatives have been carried out to minimize the road traffic crashes. One of them is to study aberrant driving behavior because most of the road accidents occurred due to human errors. In such context following study has been carried out to determine the driving behavior in Pakistan and their involvement in road traffic crashes.

In order to measure driving behavior a questionnaire was developed from Manchester driving behavior questionnaire and was tailored according to Pakistan's context. After the modification of questionnaire, a pilot survey was conducted with the faculty of National Institute of Transportation (NIT) for further rectification. After which a final version of driving behavior questionnaire was developed.

After the development of questionnaire sample size was calculated using (Dillman Don, 2007) formula i.e.

$$N_s = \frac{(N_p)(p)(1 - p)}{(N_p - 1)(B/C)^2 + (p)(1 - p)}$$

where:

$N_s$  = completed sample size needed (notation often used is  $n$ )

$N_p$  = size of population (notation often used is  $N$ )

$C$  = Z statistic associate with confidence interval (1.645 = 90% confidence level;

1.960 = 95% confidence level; 2.576 = 99% confidence level)

$p$  = proportion expected to answer a certain way (50% or 0.5 is most conservative)

$B$  = acceptable level of sampling error (0.05 =  $\pm 5\%$ ; 0.03 =  $\pm 3\%$ )

According Dillman sample size was estimated to be 248 using population of 100,000 because it was stated by Dillman that population exceeding 20,000 sample size vary by very small margin and for estimation of sample size confidence level of 95% was selected and proportion expected to answer in a certain was taken as 0.5 which most conservative approach and sampling error was taken to be 0.05.

After the development of Questionnaire, responses were recorded by conducting field interview of drivers. The questions were formulated in way that how often do you engage in road traffic crash or what are the likelihood to be involved in road traffic crash. The respondents answered on

a Likert scale of 1-5, based on their past experiences. Where each score represents its importance in overall road safety i.e. 1= hardly ever, 2= very rarely, 3=occasionally 4= frequently 5= nearly all the time.

Sample size was stratified on the basis of age groups and socio economic characteristics to get the better insight of driving behavior in different groups of populations. Samples were collected through field interviews where respondents were asked to respond car driving behavior research was focused on car driving behavior and responses were recorded. Initially peoples were not willing to respond because they think this might be used against them due to formation of questions such that how often do you involve in road traffic crashes or how often do you commit violations. Respondents were assured that this is only for research purpose and data acquired will only be used for academic purpose only. Data was collected from different parts of Islamabad and Rawalpindi including parking lot of Centaurus, parking lot of Daewoo bus terminal from different offices and from the parking of Nust university. Sample size was calculated from Dillman don formula according to which sample size was estimated to be 248 whereas a sample size of 250 observations were recorded.

Driver were not ready to answer the questionnaire because questionnaire consisted of question like do you involve in road traffic crash or how often to breach law but then they were convinced that this is only for research purpose and it will not gather any personal information and it will be useful in improving overall safety on road network as driving behavior account for the most of road crashes so it is important to determine the typical human behavior that are involved in road crashes. As human we all make mistakes while driving and there is nothing wrong in it which motivated drivers to answer the questionnaire.



Questionnaire was developed in such a manner that it comprises the driving errors that are mostly occurred due to inattention of driver or violation that are deliberate deviation from predefined set of traffic rules.

Respondents answered on Likert scale of 1-5 based on their past driving experiences which includes;

- Hardly ever
- Very rarely
- Occasionally
- Frequently
- Nearly all the time

Questionnaire was developed in such a manner that it comprises the driving errors that mostly occur due to inattention of driver or violation that are deliberate deviation from predefined set of traffic rules.

## RESEARCH METHODOLOGY

### 4.1 Background

In this research, an effort was made to understand the association of drivers' involvement in RTCs with various explanatory variables. In 1998, (Duncan *et al.*, 1998) showed that unordered multinomial logit models, nested logit and probit models which account for the categorical nature of the response variable, cannot be used to account for the ordinal nature. A multinomial logit model can be considered for better results in a case when the response variable is unordered and the IIA (Independence of Irrelevant Alternatives) assumption is satisfied (Borooah, 2002; Scott Long, 1997). In this study, drivers' involvement in RTCs is ordinal in nature. The drivers' involvement in RTCs was categorized on a five levels ordinal scale as never, very rarely, occasionally, frequently and nearly always. In the past, ordered probit model was extensively applied in case of ordinal dependent variable. This study estimates and ordered probit model to investigate the relation of drivers' involvement in RTCs and various explanatory variables. According to the generalized equation of ordered probit model a latent variable i.e. unobserved, " $Y_i^*$ " can be written as,

$$Y_i^* = \beta X_i + \varepsilon_i \quad (4.1)$$

Where

$Y_i^*$  = latent (continuous variable) and is measure of driver involvement in RTCs of category  $i$ .

$X_i$  = ( $k * 1$ ) vector of observed non-random explanatory variables.

$\beta$  = ( $k * 1$ ) vector of parameters to be estimated.

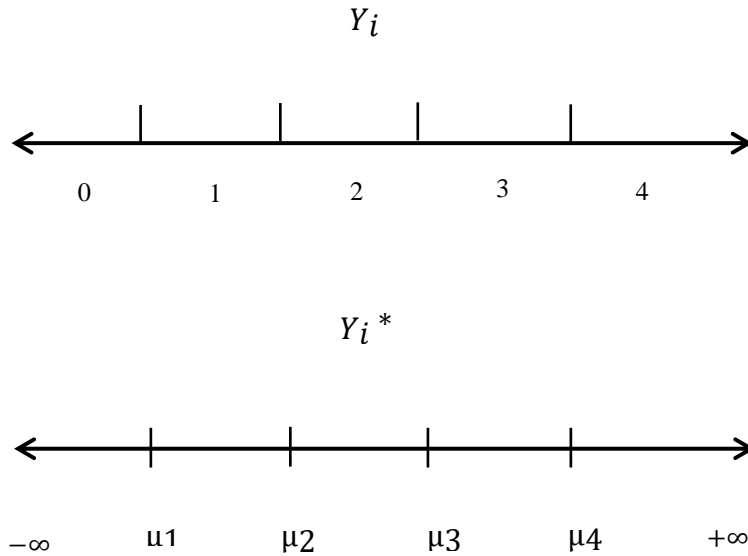
$\varepsilon_i$  = random error term assumed to follow normal distribution (i.e. mean=0 and variance=1).

For any given driver involvement in RTCs,  $Y_i^*$  can be related to a observed drivers' involvement in RTCs,  $Y_i$ , through the following equations (Ye *et al.*, 2014)

$$Y_i = \begin{cases} 0 & \text{if } -\infty \leq Y_i^* \leq \mu_1 & \text{(a driver never involved in RTCs)} \\ 1 & \text{if } \mu_1 < Y_i^* \leq \mu_2 & \text{(a driver very rarely involved in RTCs)} \\ 2 & \text{if } \mu_2 < Y_i^* \leq \mu_3 & \text{(a driver occassionally involved in RTCs)} \\ 3 & \text{if } \mu_3 < Y_i^* \leq \mu_4 & \text{(a driver frequently involved in RTCs)} \\ 4 & \text{if } \mu_4 < Y_i^* \leq +\infty & \text{(a driver never nearly always involved in RTCs)} \end{cases} \quad 4.2$$

Where  $\mu$ 's = thresholds values to be estimated for all involvement levels that defines  $Y_i$ . The relationship of latent performance variable,  $Y_i^*$ , and the observed performance level,  $Y_i$ , is shown with the help of the figure as given below,

Figure 1: Relationship between latent,  $Y_i^*$  and coded involvement variable,  $Y_i$



The likelihood that a driver  $i$  with a crash involvement level  $j$ , is equal to the likelihood that the latent performance tendency,  $Y_i^*$  will consider a value between two fixed thresholds parameters ( $\mu_j$  and  $\mu_{j+1}$ ). The probability associated with each crash involvement level is given as,

$$Prob(Y_i = 0) = \varphi(\mu_1 - \beta X_i)$$

$$\begin{aligned}
Prob(Y_i = 1) &= \varphi(\mu_2 - \beta X_i) - \varphi(\mu_1 - \beta X_i) \\
Prob(Y_i = 2) &= \varphi(\mu_3 - \beta X_i) - \varphi(\mu_2 - \beta X_i) \\
Prob(Y_i = j) &= \varphi(\mu_{j+1} - \beta X_i) - \varphi(\mu_j - \beta X_i) \\
Prob(Y_i = J) &= 1 - \varphi(\mu_J - \beta X_i)
\end{aligned} \tag{4.3}$$

In the above equation (3), the symbol  $\varphi$  stands for cumulative normal distribution function. When a constant term is included in the model, the LIMDEP is unable to estimate one of the thresholds (i.e. by maximum likelihood technique). (W. H. Greene, 2000) came up with a suggestion to solve this issue by considering the first threshold equal to 0. The thresholds in the model should follow the ordering as given in equation (4), in order to have positive probabilities for each of the safety performance level as given in equation (3).

$$\mu_1 = 0 < \mu_2 < \dots < \mu_j - 1 \tag{4.4}$$

The ordered probit model only estimate the probability of the two extreme levels of the response variable which is why, marginal effects are calculated to understand the effect of unit change in any explanatory variable i.e.  $X_i$  on the probabilities of the intermediate categories of the response variable as;

$$\frac{Prob(Y=j)}{\partial x} = [\varphi(\mu_{j+1} - \beta X_i) - \varphi(\mu_j - \beta X_i)]\beta \quad j = 0,1,2,3 \tag{4.5}$$

The above equation can be used for estimation of the marginal effects when the explanatory variable is continuous. A unit change means when there is a unit increase or decrease in the value of explanatory variable from its mean value. In case, explanatory variable is categorical (i.e. not continuous),(J. C. Greene, 2007) suggested that marginal effects of the categorical variable or binary variable  $X_i$  (i.e. when  $X_i$  changes from 0 to 1 while holding all other variables at their mean

values) on the corresponding probabilities of each accident involvement level can be calculated as,

$$X_i = P(y = j|X_i = 1) - P(y = j|X_i = 0) \quad (4.6)$$

## 4.2 Data Description

**Table 4.1: Frequency distribution of driver's involvement in a crash**

<i>Crash involvement</i>	<i>Never</i>	<i>Very rarely</i>	<i>Occasionally</i>	<i>Frequently</i>	<i>Nearly all time</i>
<i>Relative frequency</i>	64.74%	12.94%	17.26%	4.31%	0.72%

**Table 4.2: Frequency Statistics of Significant Independent Variables**

<i>Variable</i>	<i>Description</i>	<i>Mean (S.D)</i>
<i>Driver age indicator</i>	<i>Age of the driver in years</i>	<i>30.16 (8.75)</i>
<i>Driver experience indicator</i>	<i>1 if driving experience is greater than 8 years, 0 otherwise</i>	<i>0.3884</i>
<i>Hit back indicator</i>	<i>1 if a driver hit something frequently or nearly all the time while backing, 0 otherwise</i>	<i>0.0791</i>
<i>Cell-bluetooth indicator</i>	<i>1 if a driver never use cell phone or Bluetooth during driving or use very rarely, 0 otherwise</i>	<i>0.7553</i>
<i>Reduce speed indicator</i>	<i>1 if a driver reduce speed frequently or nearly all the time on wet/slippery road, 0 otherwise</i>	<i>0.5251</i>

**Table 4.3: Variables and Their Description**

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**S.NO Variable and their Description**

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1	Driver age (i.e. 1 if under 18, 2 if 19 -30, 3 if 31-45, 4 if 46-60, 5 if above 60)
2	Gender (i.e. 1 if male, 0 otherwise)
3	Education Level (i.e. 1 if under matric, 2 if FA, 3 if Bachelors, 4 if Masters, 5 if PhD)
4	Employment
5	Income (i.e. 1 if below 20k pm, 2 if 20k-50k, 3 if 50k-100k, 4 if 100k-200k, 5 if above 200k )
6	driving experience (continuous or categorical)
7	involved in accident (i.e. 1 if no, if yes then, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
8	Major accidents causing fatalities and severe injuries (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
9	Minor accidents causing no fatalities only minor injuries (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
10	Property damage only (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
11	become angered by another road user (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
12	overtake a car from wrong side (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
13	drive so close to the car in front (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
14	cross intersection when traffic light is red (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
15	check speedometer and discover the you are overspeeding (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
16	try to pass in risky circumstances (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
17	use of seatbelt while driving (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
18	receive call on mobile while driving (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
19	fail to notice that pedestrians are crossing (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
20	fail to check rear view mirror (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
21	misjudge the distance between oncoming vehicle (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
22	hit something when backing up (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
23	driving in fatigue conditions (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)

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**S.NO Variable and their Description**

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- 24 talking to other passenger while driving (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 25 use of earphone/Bluetooth to attend calls during driving (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 26 slow down and yield to pedestrian/cyclist/motorcyclist (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 27 reduce speed while slippery/wet conditions (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 28 miss your exit on motorway (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 29 use high beam on two-way road (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 30 use mobile, GPS or map while driving (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 31 avoid driving when emotionally/mentally disturbed (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 32 read billboards while driving (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 33 fail to give right of way to overtaking vehicles (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
- 34 use of indicators before changing lane/turning (i.e. 1 if never, 2 if very rarely, 3 if occasionally, 4 if frequently, 5 if nearly all the time)
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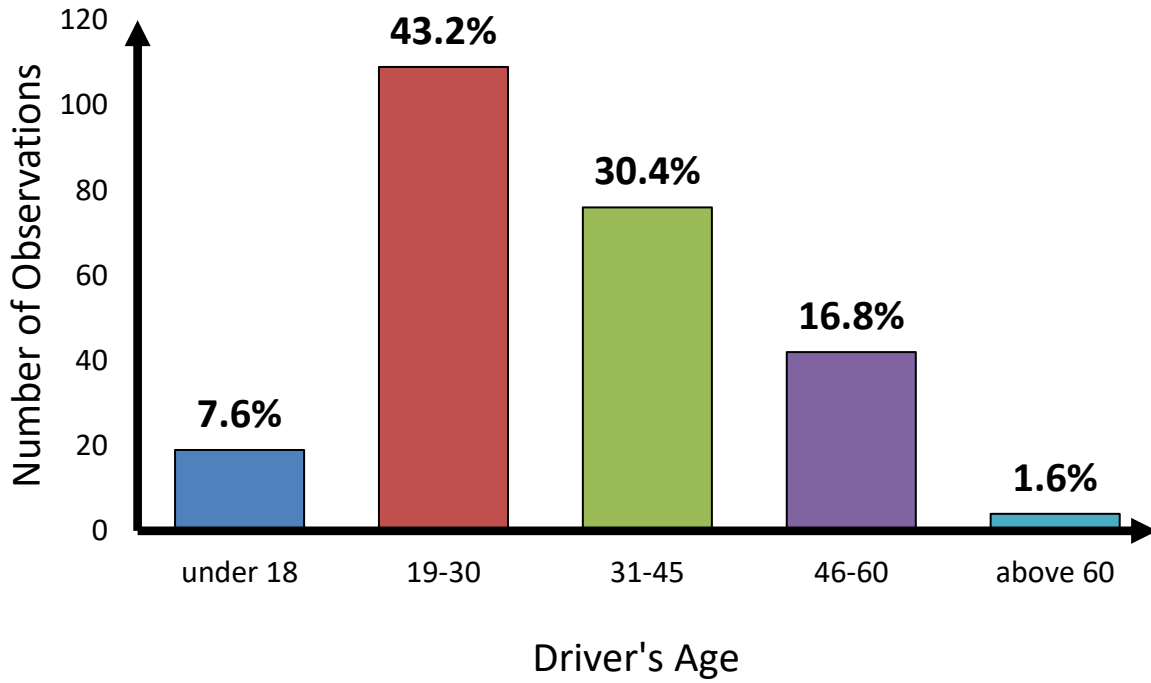


Figure 4.1: Driver's Age

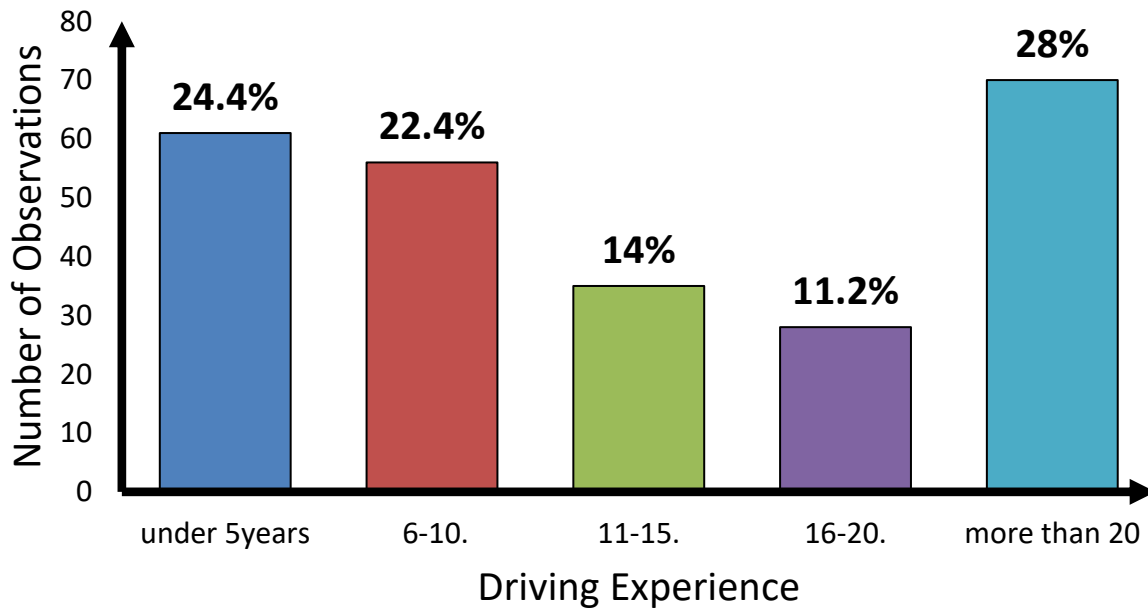
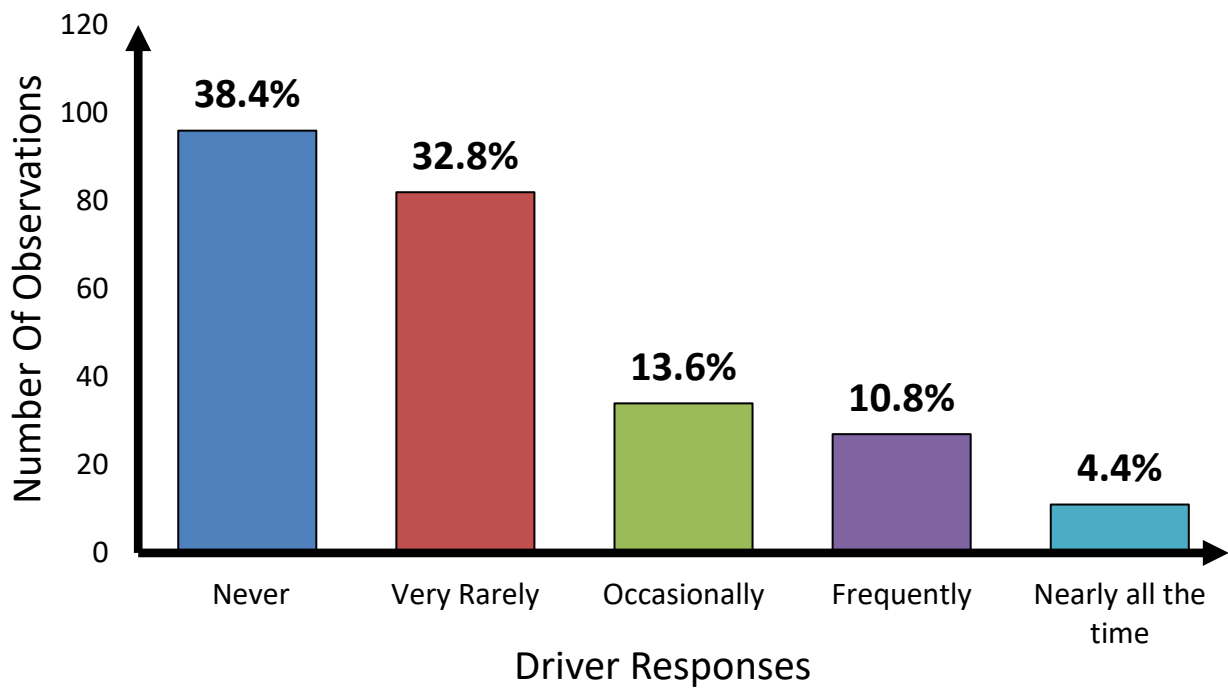
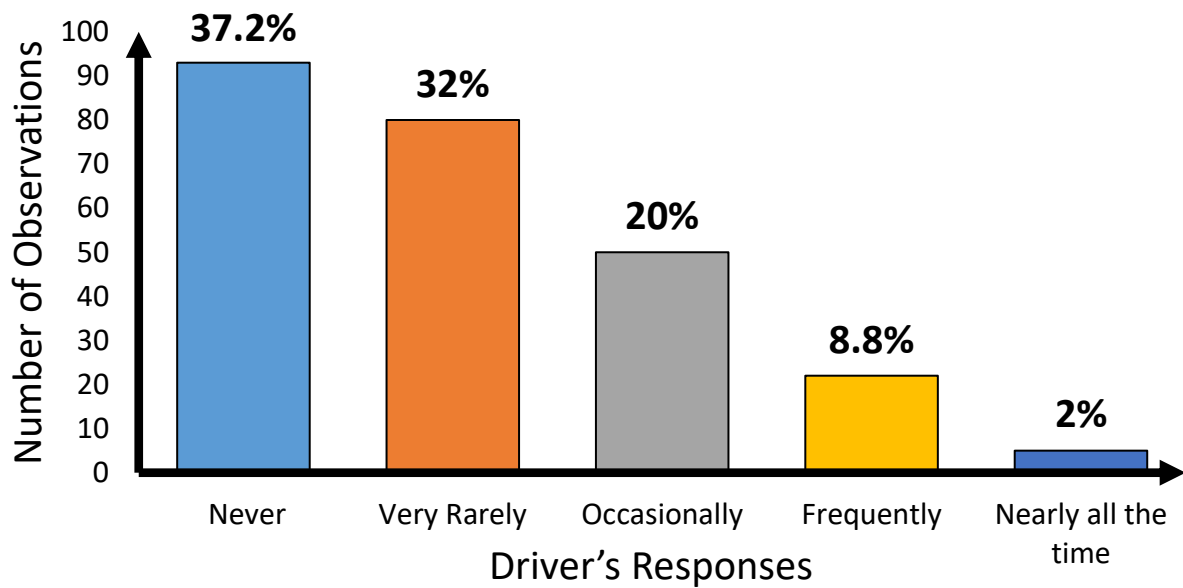


Figure 4.2: Driving Experience

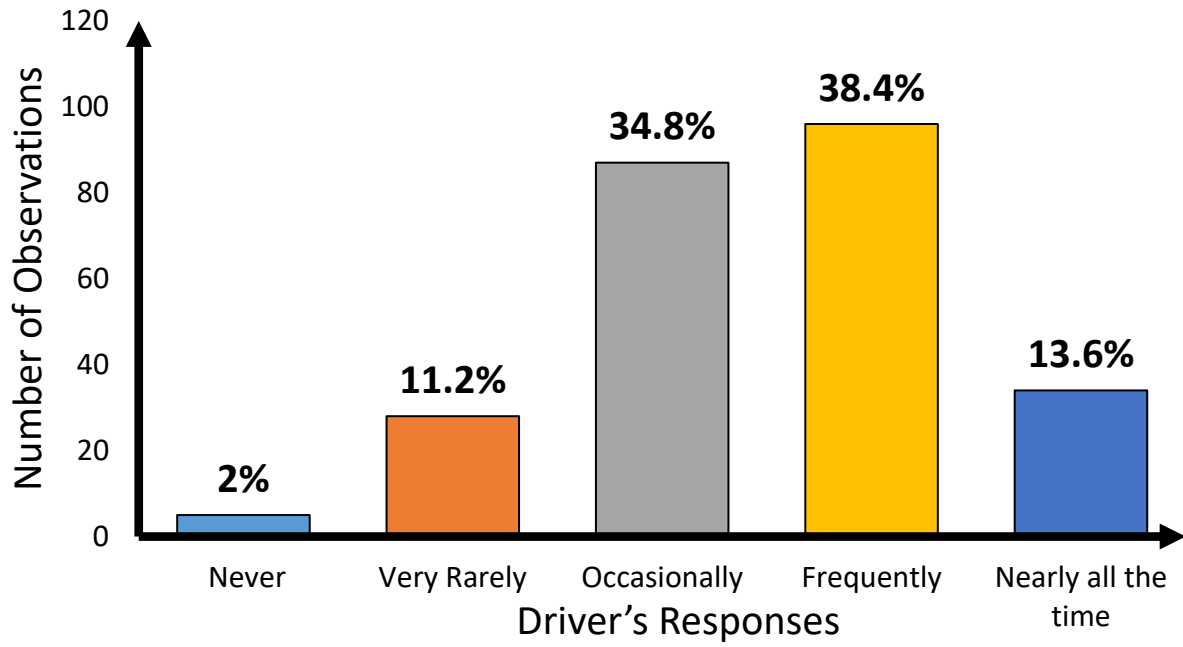




*Figure 4.3: Use of Bluetooth to Receive Call while Driving*



*Figure 4.4: Hit Back While Reverse*



*Figure 4.5 Reduce speed on wet/Slippery Roads*

## RESULTS AND DISCUSSIONS

### 5.1 Background

This study investigates the factors affecting involvement of drivers in RTCs by estimating an ordered probit model due to the ordinal nature of the response variable like never, very rarely, occasionally, frequently and nearly all the time. The statistical significance of the explanatory variables was checked against 95% level of confidence criteria. Five variables were found in significant association with the response variable (Table. 5.1). The positive coefficient of the explanatory variable suggests that the probability of nearly all the time involvement in RTCs increases while probability of never involved in RTCs decreases with a unit increase in the specific explanatory variable and vice versa.

*Table 5.1: Estimation Results of Ordered Probit Model*

<i>Variable</i>	<i>Coefficient</i>	<i>t-stat</i>
<i>Constant</i>	<i>1.0107</i>	<i>2.299</i>
<i>Driver age indicator</i>	<i>-0.0323</i>	<i>-2.047</i>
<i>Driver experience indicator</i>	<i>0.6650</i>	<i>2.474</i>
<i>Hit back indicator</i>	<i>1.2125</i>	<i>3.269</i>
<i>Cell-bluetooth indicator</i>	<i>-0.5386</i>	<i>-2.263</i>
<i>Reduce speed indicator</i>	<i>-0.6900</i>	<i>-3.120</i>
$\mu_1$	<i>0.4487</i>	<i>4.763</i>
$\mu_2$	<i>1.4698</i>	<i>7.754</i>
$\mu_3$	<i>2.6103</i>	<i>5.762</i>

<i>Number of observations</i>	250
<i>Degrees of freedom</i>	5
<i>Log likelihood</i>	-142.75
<i>Restricted log likelihood</i>	-144.48
<i>Adjusted rho-squared (<math>\rho^2</math>)</i>	0.0119

In order to understand the effects of unit change in the specific explanatory variable on the probabilities of the intermediate categories of the response variable, marginal effects were estimated (Table. 5.2).

**Table 5.2: Marginal Effects of The Statistically Significant Variables**

<i>Variable</i>	<i>Never</i>	<i>V.rarely</i>	<i>Occasionally</i>	<i>Frequently</i>	<i>Near all time</i>
<i>Driver age indicator</i>	0.0120	-0.0029	-0.0068	-0.0022	-0.0001
<i>Driver experience indicator</i>	-0.2487	0.0513	0.1408	0.0523	0.0043
<i>Hit back indicator</i>	-0.4524	0.0171	0.2302	0.1758	0.0293
<i>Cell-bluetooth indicator</i>	0.2063	-0.0381	-0.1174	-0.0468	-0.0040
<i>Reduce speed indicator</i>	0.2534	-0.0567	-0.1430	-0.0499	-0.0038

The statistical significant variables include, driver's age, driver's experience, hitting back during reverse drive, use of cell phone and Bluetooth while driving and reduce speed on slippery or wet road. The model results suggest that the probability of nearly all the time involvement in RTC decreases with a unit increase in the driver age indicator. With aging drivers become more conscious so they avoid risk taking by moving with lower speed, using safety restraints etc. which consequently reduce their involvement in RTCs. This finding is consistent with studies in the past studied carried out by (Eby & Molnar, 1998) and found that with increase in age from 18 to 25

involvement in crashes reduced significantly.(David W, 1995). The estimation results predict that drivers with more than eight year drivers experience are more likely to be involved in nearly all the time RTCs. This is due to the fact experienced driver are more confident due to which they avoid certain safety precaution and regulations like seatbelt use, speed regulation etc. which leads them to be involved in road crashes. The finding is found consistent with the past studies. Study carried out by eby el al found that after the age of 23 involvement in road traffic crash increases. (David W, 1995). Also, the probability of nearly all the time involvement in RTCs increase with a unit increase in the hit back indicator (hit object frequently or nearly all the time during reverse move). This indicates the careless and inexperienced drivers who get involved in nearly all the time RTCs. Proper use of side mirror and rear view central mirror along can help mitigating this issue. According to model outcomes, the never or very rare use of cell phone and blue tooth by drivers during driving decrease the probability of getting involved in RTCs for nearly all the time. The finding is found consistent with the past studies. Study carried out by (Nikolaev *et al.*, 2010) concluded that after enacting ban on cell phone use while driving fatal and non-fatal accidents reduced significantly (Nikolaev *et al.*, 2010). The model outcomes predict that probability of getting involved in nearly all the time RTCs increases with a unit increase in reduce speed indicator (i.e. reduce speed frequently or nearly all the time on wet or slippery roads). the effects of unit increase in the significant explanatory variables on the intermediate categories of getting involved in RTCs can be understood from Table. 5.2.

# CONCLUSION AND RECOMENDATIONS

## 6.1 Conclusion

Everyone recognizes that, in today's world transportation is key element of the global economy. It has changed the face of employment trade family life and health care, bringing benefits that were unimaginable 100 years ago, however the price we are paying in the form of road crash mortality and morbidity for such benefits is too high. The shock and grief these events causes are all too well-known throughout the world. Their impact is particularly higher in pooper countries, where 90% of the road fatalities occur. Thousands of people die on the Pakistan's road every year. It's not about the random events or accident these are road crashes. in developing countries like Pakistan, the poor are disproportionately affected, with most of the victims being pedestrian, bicyclist, motorcyclist and passenger of public transport riders and with more than half of them between ages of 15 to 44 years.

The road crashes are a human tragedy that results in health, environment and social problems and have a significant impact on national economic growth strategies. And 95% of the accidents are due to human errors.

As driving behavior is one the key source of road traffic accidents this study further elaborates the key human behavior that are most likely to be involved in road accidents. Past researches also endorse that driving behavior is link with the chances of involvement in road crashes. this study consistent with past researches and found five factors significant as predictor of collision risk.

- Based on models' interpretations as the age of driver increases they are less likely to be involved in road crashes because as age increases drivers become more aware of the

potential consequences of risky driving and become more vigilant while driving hence reduced the chances of road crashes. Its unequivocal from model that with increase in age driver become more cautious.

- Model also predicts that as the experience of driver increase they are prone to be involved in crashes because they presume themselves to be skilled in driving hence taking more risk while driving like tailgating, giving close call while overtaking more involved in overspending hence increases their chances in involvement in road accidents.
- Model predicts that drivers those involved in minor mistakes like hit back while backing up are more likely to be involved in road traffic crashes because such errors depicts their unskilled driving and inexperienced drivers are more likely to involve in road crashes.
- Model predicts that never or less use of cellphone while driving reduces the chances of involvement in road crashes because it unequivocal with past researches that use of cellphone while driving is one of the main reason of road crashes because use of cell phone distracts drivers and while using cell phone drivers distracts their eyes from roadway and that could be dangerous because glance of seconds doubles the risk of crashes.
- Model predicts that reducing speed on wet or slippery road reduces the risk of being involved in road crashes because cautious driving reduces the risk of involvement in road accidents as drivers pays more attention to every event that occurs while driving.

## 6.2 Recommendations

This study focus on Driving Behavior as Predictor of collision risk.

- Studying driving behavior is proactive approach to mitigate the problem before it took place
- Human behavior plays key role in road traffic crashes (RTCs)
- Concern authorities may be benefited by current study as it predicts the key human factors that are involved in crashes.
- Highway agencies in Pakistan may enforce the speed limits, restrict the use of cellphone while driving hence reducing the possibility of road traffic crashes.
- Initiate awareness campaigns to provide education to drivers that how their aberrant behavior effects the road safety and what sought of behaviors are more likely to be involved in road traffic crashes.
- Highway agencies in Pakistan should design roadways such that they pose minimum chances of the drivers' errors as inconsistent roadway design will lead human errors
- Roadway design should be consistent with drivers' expectancy.
- Findings of this study can help Highway agencies in Pakistan to formulate legislation like enforcement of speed limits, restrict use of cellphone while driving etc. reducing possibility of RTCs.
- Highway Agencies should educate drivers via education and awareness campaigns that how their aberrant behavior effects the road safety and what type of behaviors are more likely to be involved in RTCs.



- Introduce policies for targeted enforcement aimed at changing unsafe road user behavior
- Develop and implement comprehensive education programs to combat aggressive driving particularly targeting young drivers.
- Develop multi-media (audio/video) drivers 'education program to educate illiterate drivers.

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## Appendix: Driving Behavior Questionnaire

### Car Driver Behavior Questionnaire

#### Driver information

Age: \_\_\_\_\_(Years)

Gender: \_\_\_\_\_(Male/Female)

Education: \_\_\_\_\_ (Under Matric/FA/Bachelors/Masters/PHD)

Occupation: \_\_\_\_\_

Monthly income(optional): \_\_\_\_\_

Driving since: \_\_\_\_\_(Years)

Involved in crash: \_\_\_\_\_(Yes/No)

If yes then: (1) hardly ever (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

Based on your previous driving experience and considering your driving capabilities/habits what are the chances that you may be involved in road accident

(Major accidents causing fatalities and severe injuries)

(1) Never (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

(Minor accidents causing no fatalities only minor injuries)

(1) Never (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

(Property damage only causing no injuries only damage to vehicle or road side elements)

(1) Never (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

## **Appendix A: Driving Behavior Questionnaire**

### **Tick the appropriate answer for each question**

#### **Violations**

- 1) Become angered by another road user and show your annoyance by whatever means you can  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 2) Overtake a car from wrong side (left side)  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 3) Drive so close to the car in front that it would be difficult to stop in emergency  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 4) Cross intersection knowing that the traffic light has already turned red  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 5) Check your speedometer and discover that you are over speeding  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 6) Try to pass in risky circumstances (e.g. poor visibility, opposite direction vehicle is too close, restricted overtaking space)  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 7) Use seatbelt while driving  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 8) Receive call on mobile while driving or read/replying to text messages?  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time

## **Appendix: Driving Behavior Questionnaire**

### **Errors**

- 1) Fail to notice that pedestrians are crossing when turning into a side street from main road  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 2) Fail to check your rear-view mirror before pulling out, changing lane etc.  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 3) Misjudge the distance between oncoming vehicle  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 4) Hit something when backing up  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 5) Driving in fatigue conditions  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 6) Talking with the other passenger while driving  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 7) Use earphone/Bluetooth to attend calls during driving?  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 8) Slow down and yield to Pedestrian, Cyclist, or Motorcyclists?  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 9) Reduce speed while driving in slippery/wet conditions  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time



## **Appendix: Driving Behavior Questionnaire**

### **Lapses**

- 1) Miss your exit on a motorway  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 2) Use high beam on two-way road  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 3) Use mobile, GPS or map while driving  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 4) Avoid driving when emotionally/mentally disturbed  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 5) Read billboards while driving  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 6) Fail to give right of way to overtaking vehicles  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
  
- 7) Use of indicators before changing lane/ turning  
a) Never    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time

## Appendix B: Filled Driver Behavior Questionnaire

### Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: \_\_\_\_\_ (مرد / عورت)

عمر: \_\_\_\_\_ 35 (سال)

تعلیم: \_\_\_\_\_ (Under Matric / FA / Bachelors / Masters / PHD)

پیشہ: \_\_\_\_\_ ڈرائیور  
ماہانہ آمدنی: \_\_\_\_\_ 15,000 (اختیاری)

کب سے گاڑی چلا رہے ہیں: \_\_\_\_\_ 5 (سال)

حادثے میں ملوث: \_\_\_\_\_ (ہاں / نہیں)

اگر ہاں تو 1 (شاید ہی کبھی) 2 (بہت کم) 3 (کبھی کبھار) 4 (اکثر) 5 (تقریباً ہر وقت)

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی کبھار) 4 (اکثر) 5 (تقریباً ہر وقت)

معمولی حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی کبھار) 4 (اکثر) 5 (تقریباً ہر وقت)

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی کبھار) 4 (اکثر) 5 (تقریباً ہر وقت)

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور غصے کا اظہار کسی بھی طریقے سے کرنا

1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی کبھار) 4 (اکثر) 5 (تقریباً ہر وقت)

2. غلط سمت سے ست چلتے گاڑی کو اوور ٹیک کرنا (بائیں جانب سے)
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو بنگامی صورت حال میں روکن مشکل ہو جائے
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
5. سپیڈ میٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اوور ٹیک کی جگہ)
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)

### غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نا دیکھنا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط انداز لگانا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
- 1 (کبھی نہیں) 2 (بہت کم) 3 (کبھی بھار) 4 (اکثر) 5 (تقریباً ہر وقت)

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. اپنی گاڑی کو سٹ کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یا روڈ کے گیٹا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکنٹا

1. موٹروے پر Exit کا رہ جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر بائیں نیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. اوور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: \_\_\_\_\_ (مرد / عورت)

عمر: 43 (سال)

تعلیم: \_\_\_\_\_ (Under Matric / FA / Bachelors / Masters / PHD)

پیشہ: سرکاری ملازم

ماہانہ آمدنی: 35000/- (اختیاری)

کب سے گاڑی چلا رہے ہیں: 2006 (سال)

حادثے میں ملوث: \_\_\_\_\_ (ہاں / نہیں)

آرہاں تو ( 1 ) شاید ہی کبھی (2) بہت کم (3) کبھی بھرا (4) اکثر (5) تقریباً ہر وقت

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1 ( کبھی نہیں ) (2) بہت کم (3) کبھی بھرا (4) اکثر (5) تقریباً ہر وقت

معمولی حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

✓ 1 ( کبھی نہیں ) (2) بہت کم (3) کبھی بھرا (4) اکثر (5) تقریباً ہر وقت

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1 ( کبھی نہیں ) (2) بہت کم (3) کبھی بھرا (4) اکثر (5) تقریباً ہر وقت

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور غصے کا اظہار کسی بھی طریقے سے کرنا

1 ( کبھی نہیں ) (2) بہت کم (3) کبھی بھرا (4) اکثر (5) تقریباً ہر وقت

2. غلط سمت سے سٹ پلٹے گاڑی کو اوور ٹیک کرنا (بائیں جانب سے)
- 1 ( ) کبھی نہیں ✓ (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
- 1 ✓ ( ) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
- 1 ( ) کبھی نہیں ✓ (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
5. سپیڈومیٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
- 1 ( ) کبھی نہیں (2) بہت کم (3) کبھی کبھار ✓ (4) اکثر (5) تقریباً ہر وقت
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اوور ٹیک کی جگہ)
- 1 ✓ ( ) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
- 1 ( ) کبھی نہیں (2) بہت کم ✓ (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
- 1 ✓ ( ) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

### غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نادیکھنا
- 1 ( ) کبھی نہیں (2) بہت کم ✓ (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
- 1 ✓ ( ) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط انداز لگانا
- 1 ✓ ( ) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
- 1 ( ) کبھی نہیں ✓ (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
- 1 ( ) کبھی نہیں (2) بہت کم ✓ (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) ✓ بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) ✓ بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. اپنی گاڑی کو سست کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) ✓ تقریباً ہر وقت
9. بارش ہونے پر یاروڈ کے گیلیا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) ✓ اکثر (۵) تقریباً ہر وقت

### چوکنٹا

1. موڑوں پر Exit کا رو جانا  
 (۱) کبھی نہیں (۲) ✓ بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر بائیں ٹیم کا استعمال  
 (۱) کبھی نہیں (۲) ✓ بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) ✓ کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) ✓ اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) ✓ کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. اوور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) ✓ کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) ✓ بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: مرد (مرد / عورت)

عمر: 29 (سال)

تعلیم: Masters. (Under Matric/FA/Bachelors/Masters/PHD)

ماہانہ آمدنی: \_\_\_\_\_ (اختیاری)

پیشہ: پلاز صحت

کب سے گاڑی چلا رہے ہیں: 2008 (سال)

حادثے میں ملوث: \_\_\_\_\_ (ہلکا / نہیں)

اگر ہاں تو 1) شاید ہی کبھی (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

معمول حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور غصے کا اظہار کسی بھی طریقے سے کرنا

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت



2. غلط سمت سے سٹ چلتے گاڑی کو اوور ٹیک کرنا (بائیں جانب سے)
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
5. سپیڈومیٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اوور ٹیک کی جگہ)
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت

## غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نادیکھنا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط انداز لگانا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
- 1) کبھی نہیں (✓) بہت کم (2) کبھی کبھار (3) اکثر (4) (5) تقریباً ہر وقت

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth/earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
8. آہنی گاڑی کو سست کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یا روڈ کے گیلا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکنٹا

1. موٹروے پر Exit کا رہ جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر ہائی بیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی/ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
6. اوور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت

## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: مرد (مرد / عورت)

عمر: 24 (سال)

تعلیم: Under Matric/FA/Bachelors/Masters/PHD

ماہانہ آمدنی: 22000 (اختیاری)

پیشہ: clerk

کب سے گاڑی چلا رہے ہیں: 7 (سال)

حادثے میں ملوث: کہاں / نہیں

اگر ہاں تو 1 (شاید ہی بھی) 2 (بہت کم) 3 (بھی کبھی) 4 (اکثر) 5 (تقریباً ہر وقت)

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1 (بھی نہیں) 2 (بہت کم) 3 (بھی کبھی) 4 (اکثر) 5 (تقریباً ہر وقت)

معمولی حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

1 (بھی نہیں) 2 (بہت کم) 3 (بھی کبھی) 4 (اکثر) 5 (تقریباً ہر وقت)

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1 (بھی نہیں) 2 (بہت کم) 3 (بھی کبھی) 4 (اکثر) 5 (تقریباً ہر وقت)

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور غصے کا اظہار کسی بھی طریقے سے کرنا

1 (بھی نہیں) 2 (بہت کم) 3 (بھی کبھی) 4 (اکثر) 5 (تقریباً ہر وقت)

2. غلط سمت سے ست چلتے گاڑی کو اوور ٹیک کرنا (بائیں جانب سے)
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
5. سپیڈومیٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اوور ٹیک کی جگہ)
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت

### غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نادیکھنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط انداز لگانا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) کبھی کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. اپنی گاڑی کو سٹ کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یاروڈ کے گیٹا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکننا

1. موٹروے پر Exit کا رہ جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. دوطرفہ سڑک پر ہائی بیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. اوور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: \_\_\_\_\_ (مرد / عورت)

عمر: 54 (سال)

تعلیم: \_\_\_\_\_ (Under Matric / FA / Bachelors / Masters / PHD)

BA

ماہانہ آمدنی: 50,000 (اختیاری)

پیشہ: سپر وکیل

کب سے گاڑی چلا رہے ہیں: 1997 (سال)

حادثے میں ملوث: 80 (ہاں / نہیں)

اگر ہاں تو (1) شاید ہی کبھی (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہیں کہ آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

اکسا (کبھی نہیں) (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

معمول حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

اکسا (کبھی نہیں) (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

(1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور غصے کا اظہار کسی بھی طریقے سے کرنا

(1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

2. غلط سمت سے سٹ چلتے گاڑی کو اوور ٹیک کرنا (بائیں جانب سے)
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
5. سپیڈ میٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اوور ٹیک کی جگہ)
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت

### غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نا دیکھنا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط انداز لگانا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
- ✓ (1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. اپنی گاڑی کو سست کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یا روڈ کے گیلا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکنٹا

1. موٹروے پر Exit کا رخ جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر بائیں نیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. اوور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

تقریباً ہر وقت  
 کاغذ استعمال کے مطابق  
 15/12/2017



## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: \_\_\_\_\_ (مرد / عورت)

عمر: 30 (سال)

تعلیم: \_\_\_\_\_ (Under Matric / FA / Bachelors / Masters / PHD)

ماہانہ آمدنی: \_\_\_\_\_ (اختیاری)

پیشہ: \_\_\_\_\_ (Employment)

کب سے گاڑی چلا رہے ہیں: 2008 (سال)

حادثے میں ملوث: \_\_\_\_\_ (ہاں / نہیں)

اگر ہاں تو (1) شاید کبھی بھی (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

معمولی حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور فیصہ کا اظہار کسی بھی طریقے سے کرنا

1) کبھی نہیں (2) بہت کم (3) کبھی کبھار (4) اکثر (5) تقریباً ہر وقت

2. غلط سمت سے ست چلتے گاڑی کو اور ٹیک کرنا (بائیں جانب سے)
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. سپیڈ میٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اور ٹیک کی جگہ)
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

## غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نادیکھنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط اندازا لگانا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
  - (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
8. آہنی گاڑی کو سست کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یاروڈ کے گیلا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکننا

1. موٹروے پر Exit کا رخ جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر ہائی بیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
6. اور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی بھار (۴) اکثر (۵) تقریباً ہر وقت

## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: \_\_\_\_\_ (مرد / عورت)

عمر: 35 (سال)

تعلیم: \_\_\_\_\_ (Under Matric/FA/Bachelors/Masters/PHD) M.A.S.S COMM

ماہانہ آمدنی: 5000 (اختیاری)

پیشہ: NLE

کب سے گاڑی چلا رہے ہیں: 2015 (سال)

حادثے میں ملوث: \_\_\_\_\_ (ہاں / نہیں)

اگر ہاں تو 1 (شاید ہی بھی) 2 (بہت کم) 3 (بھی بھرا) 4 (کثر) 5 (تقریباً ہر وقت)

اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1 (بھی نہیں) 2 (بہت کم) 3 (بھی بھرا) 4 (کثر) 5 (تقریباً ہر وقت)

معمولی حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

1 (بھی نہیں) 2 (بہت کم) 3 (بھی بھرا) 4 (کثر) 5 (تقریباً ہر وقت)

ایسے حادثات جن سے جانی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1 (بھی نہیں) 2 (بہت کم) 3 (بھی بھرا) 4 (کثر) 5 (تقریباً ہر وقت)

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور غصے کا اظہار کسی بھی طریقے سے کرنا

1 (بھی نہیں) 2 (بہت کم) 3 (بھی بھرا) 4 (کثر) 5 (تقریباً ہر وقت)

2. غلط سمت سے ست چلتے گاڑی کو اوور ٹیک کرنا (بائیں جانب سے)
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
4. چورہا کر اس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
5. سپیڈومیٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
6. خطرناک حالات میں کر اس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اوور ٹیک کی جگہ)
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)

### غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نا دیکھنا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط انداز لگانا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
- 1 (کبھی نہیں) 2 بہت کم 3 کبھی کبھار 4 اکثر (5 تقریباً ہر وقت)

6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. اپنی گاڑی کو سست کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یا روڈ کے گیلا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکننا

1. موٹروے پر Exit کا رخ جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر ہائی بیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. اورریک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

## Driver's Behavior Questionnaire

ڈرائیور کے بارے میں معلومات

جنس: \_\_\_\_\_ (مرد / عورت)

عمر: 25 (سال)

تعلیم: \_\_\_\_\_ (Under Matric / FA / Bachelors / Masters / PHD)

ماہانہ آمدنی: 12000 (اختیاری)

پیشہ: student

کب سے گاڑی چلا رہے ہیں: 4 (سال)

حادثے میں ملوث: \_\_\_\_\_ (کبھی / نہیں)

اگر ہاں تو ( 1 ) شاید ہی کبھی ( 2 ) بہت کم ( 3 ) کبھی کبھار ( 4 ) اکثر ( 5 ) تقریباً ہر وقت  
اپنے گزشتہ ڈرائیونگ کے تجربے کی بنیاد پر اور آپ کی ڈرائیونگ کی صلاحیتوں / عادات پر غور کرتے ہوئے کیا امکانات ہے  
کے آپ سڑک کے حادثے میں ملوث ہو سکتے ہیں

خطرناک حادثات جن سے اموات یا شدید زخمی ہونے کے امکانات

1 ( کبھی نہیں ) 2 ( بہت کم ) 3 ( کبھی کبھار ) 4 ( اکثر ) 5 ( تقریباً ہر وقت )

معمولی حادثات جن سے اموات کے بجائے معمولی زخمی ہونے کے امکانات ہوں۔

1 ( کبھی نہیں ) 2 ( بہت کم ) 3 ( کبھی کبھار ) 4 ( اکثر ) 5 ( تقریباً ہر وقت )

ایسے حادثات جن سے چابی نقصان کے بجائے صرف گاڑی یا روڈ پر موجود اشیاء کا نقصان ہو۔

1 ( کبھی نہیں ) 2 ( بہت کم ) 3 ( کبھی کبھار ) 4 ( اکثر ) 5 ( تقریباً ہر وقت )

ہر سوال کے لئے مناسب جواب پر نشان لگائیں

### خلاف ورزی

1. کسی اور ڈرائیور پر غصہ آنا اور قصے کا انحصار کسی بھی طریقے سے کرنا

1 ( کبھی نہیں ) 2 ( بہت کم ) 3 ( کبھی کبھار ) 4 ( اکثر ) 5 ( تقریباً ہر وقت )

2. غلط سمت سے ست چلتے گاڑی کو اور ٹیک کرنا (بائیں جانب سے)
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
3. سامنے گاڑی کے اتنے قریب گاڑی چالانا جو ہنگامی صورت حال میں روکنا مشکل ہو جائے
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
4. چوراہا کراس کرنا جانتے ہوئے کے ٹریفک کی بتیاں پہلے سے ہی سرخ ہو گئیں ہیں
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
5. سپیڈومیٹر کو چیک کرنا اور آپ تیزی سے ہیں معلوم ہونا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
6. خطرناک حالات میں کراس کرنے کی کوشش کرنا (مثلاً، خراب موسم، مخالف سمت گاڑی کے بہت قریب، محدود اور ٹیک کی جگہ)
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
7. دوران ڈرائیونگ سیٹ بیلٹ کا استعمال نہ کرنا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
8. ڈرائیونگ کے دوران موبائل پر کال وصول کرنا یا پیغامات پڑھنا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت

### غلطیاں

1. ایک مرکزی شاہراہ سے ایک طرف گلی میں جاتے ہوئے پیدل چلنے والوں کو سڑک پار کرتے نا دیکھنا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
2. لین تبدیل کرتے ہوئے اپنے (Rear-view Mirror) میں نہ دیکھنا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
3. قریب آتے ہوئے گاڑیوں کے درمیان فاصلے کا غلط اندازہ لگانا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
4. گاڑی ریورس کرتے ہوئے کسی چیز میں لگنا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت
5. تھکاوٹ کی حالات میں ڈرائیونگ کرنا
  - 1) کبھی نہیں (2) بہت کم (3) کبھی بھار (4) اکثر (5) تقریباً ہر وقت



6. ڈرائیونگ کے دوران دوسرے مسافر کے ساتھ بات کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. ڈرائیونگ کے دوران کالز وصول کرنے کے لئے bluetooth / earphone کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
8. اپنی گاڑی کو سست کرنا اور پیدل چلنے والوں، موٹر سائیکل سوار یا سائیکل سوار کو راستہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
9. بارش ہونے پر یا روڈ کے گیٹا ہونے پر رفتار کو کم کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

### چوکنٹا

1. موٹروے پر Exit کا رو جانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
2. دو طرفہ سڑک پر بائیں نیم کا استعمال  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
3. موبائل نقشہ یا GPS کو دیکھتے ہوئے گاڑی چلانا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
4. جذباتی / ذہنی طور پر پریشانی کی صورت میں ڈرائیونگ سے گریز کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
5. ڈرائیونگ کے دوران اشتہاری بورڈ پڑھنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
6. اوور ٹیک کرنے والے گاڑیوں کو راستہ نہ دینا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت
7. اپنی لین تبدیل کرنے سے پہلے یا کسی جانب مڑنے سے پہلے اشارے کا استعمال کرنا  
 (۱) کبھی نہیں (۲) بہت کم (۳) کبھی کبھار (۴) اکثر (۵) تقریباً ہر وقت

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## Car Driver Behavior Questionnaire

### Driver information

Age: 37 (Years)

Gender: F (Male/Female)

Education: Masters (Under Matric/FA/Bachelors/Masters/PHD)

Occupation: \_\_\_\_\_

Monthly income(optional): \_\_\_\_\_

Driving since: 14 (Years)

Involved in crash: Yes (Yes/No)

If yes then: (1) hardly ever (2) Very Rarely (3)  Occasionally (4) Frequently (5) Nearly All the time

Based on your previous driving experience and considering your driving capabilities/habits what are the chances that you may be involved in road accident

(Major accidents causing fatalities and severe injuries)

(1) Never (2)  Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

(Minor accidents causing no fatalities only minor injuries)

(1) Never (2)  Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

(Property damage only causing no injuries only damage to vehicle or road side elements)

(1) Never (2) Very Rarely (3)  Occasionally (4) Frequently (5) Nearly All the time

### Tick the appropriate answer for each question

#### Violations

1) Become angered by another road user and show your annoyance by whatever means you can  
a) Never b) Very Rarely c) Occasionally d)  Frequently e) Nearly all the time

2) Overtake a car from wrong side (left side)  
a) Never b)  Very Rarely c) Occasionally d) Frequently e) Nearly all the time

- 3) Drive so close to the car in front that it would be difficult to stop in emergency  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 4) Cross intersection knowing that the traffic light has already turned red  
 a) Never b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 5) Check your speedometer and discover that you are over speeding  
 a) Never b) Very Rarely  c) Occasionally d) Frequently e) Nearly all the time
- 6) Try to pass in risky circumstances (e.g. poor visibility, opposite direction vehicle is too close, restricted overtaking space)  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 7) Use seatbelt while driving  
 a) Never b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 8) Receive call on mobile while driving or read/replying to text messages?  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time

### Errors

- 1) Fail to notice that pedestrians are crossing when turning into a side street from main road  
 a) Never b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 2) Fail to check your rear-view mirror before pulling out, changing lane etc.  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 3) Misjudge the distance between oncoming vehicle  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 4) Hit something when backing up  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 5) Driving in fatigue conditions  
 a) Never b) Very Rarely  c) Occasionally d) Frequently e) Nearly all the time
- 6) Talking with the other passenger while driving  
 a) Never b) Very Rarely c) Occasionally  d) Frequently e) Nearly all the time

- 7) Use earphone/Bluetooth to attend calls during driving?  
 a) Never    ~~b) Very Rarely~~    c) Occasionally    d) Frequently    e) Nearly all the time
- 8) Slow down and yield to Pedestrian, Cyclist, or Motorcyclists?  
 a) Never    b) Very Rarely    c) Occasionally    ~~d) Frequently~~    e) Nearly all the time
- 9) Reduce speed while driving in slippery/wet conditions  
 a) Never    b) Very Rarely    c) Occasionally    ~~d) Frequently~~    e) Nearly all the time

**Lapses**

- 1) Miss your exit on a motorway  
~~a) Never~~    b) Very Rarely    c) Occasionally    d) Frequently    e) Nearly all the time
- 2) Use high beam on two-way road  
 a) Never    ~~b) Very Rarely~~    c) Occasionally    d) Frequently    e) Nearly all the time
- 3) Use mobile, GPS or map while driving  
 a) Never    ~~b) Very Rarely~~    c) Occasionally    d) Frequently    e) Nearly all the time
- 4) Avoid driving when emotionally/mentally disturbed  
 a) Never    b) Very Rarely    ~~c) Occasionally~~    d) Frequently    e) Nearly all the time
- 5) Read billboards while driving  
 a) Never    b) Very Rarely    ~~c) Occasionally~~    d) Frequently    e) Nearly all the time
- 6) Fail to give right of way to overtaking vehicles  
 a) Never    ~~b) Very Rarely~~    c) Occasionally    d) Frequently    e) Nearly all the time
- 7) Use of indicators before changing lane/ turning  
 a) Never    b) Very Rarely    c) Occasionally    d) Frequently    ~~e) Nearly all the time~~

*[Handwritten mark]*

## Car Driver Behavior Questionnaire

### Driver information

Age: 27 (Years)

Gender: \_\_\_\_\_ (Male/Female)

Education: \_\_\_\_\_ (Under Matric/FA/Bachelors/Masters/PHD)

Occupation: \_\_\_\_\_

Monthly income(optional): \_\_\_\_\_

Driving since: 2 (Years)

Involved in crash: \_\_\_\_\_ (Yes/No)

If yes then: (1) hardly ever (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

Based on your previous driving experience and considering your driving capabilities/habits what are the chances that you may be involved in road accident

(Major accidents causing fatalities and severe injuries)

(1) Never (2)  Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

(Minor accidents causing no fatalities only minor injuries)

(1)  Never (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

(Property damage only causing no injuries only damage to vehicle or road side elements)

(1)  Never (2) Very Rarely (3) Occasionally (4) Frequently (5) Nearly All the time

### Tick the appropriate answer for each question

#### Violations

1) Become angered by another road user and show your annoyance by whatever means you can  
a) Never b)  Very Rarely c) Occasionally d) Frequently e) Nearly all the time

2) Overtake a car from wrong side (left side)  
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- 3) Drive so close to the car in front that it would be difficult to stop in emergency  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 4) Cross intersection knowing that the traffic light has already turned red  
 a) ~~Never~~ b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 5) Check your speedometer and discover that you are over speeding  
 a) Never b) ~~Very Rarely~~ c) Occasionally d) Frequently e) Nearly all the time
- 6) Try to pass in risky circumstances (e.g. poor visibility, opposite direction vehicle is too close, restricted overtaking space)  
 a) ~~Never~~ b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 7) Use seatbelt while driving  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 8) Receive call on mobile while driving or read/replying to text messages?  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time

### Errors

- 1) Fail to notice that pedestrians are crossing when turning into a side street from main road  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 2) Fail to check your rear-view mirror before pulling out, changing lane etc.  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 3) Misjudge the distance between oncoming vehicle  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 4) Hit something when backing up  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 5) Driving in fatigue conditions  
 a) Never b) Very Rarely  c) Occasionally d) Frequently e) Nearly all the time
- 6) Talking with the other passenger while driving  
 a) Never b) Very Rarely c) Occasionally  d) Frequently e) Nearly all the time

- 7) Use earphone/Bluetooth to attend calls during driving?  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 8) Slow down and yield to Pedestrian, Cyclist, or Motorcyclists?  
 a) Never b) Very Rarely c) Occasionally  d) Frequently e) Nearly all the time
- 9) Reduce speed while driving in slippery/wet conditions  
 a) Never b) Very Rarely c) Occasionally  d) Frequently e) Nearly all the time

### Lapses

- 1) Miss your exit on a motorway  
 a) Never b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 2) Use high beam on two-way road  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 3) Use mobile, GPS or map while driving  
 a) Never b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 4) Avoid driving when emotionally/mentally disturbed  
 a) Never b) Very Rarely c) Occasionally  d) Frequently e) Nearly all the time
- 5) Read billboards while driving  
 a) Never  b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 6) Fail to give right of way to overtaking vehicles  
 a) Never b) Very Rarely c) Occasionally d) Frequently e) Nearly all the time
- 7) Use of indicators before changing lane/ turning  
 a) Never b) Very Rarely c) Occasionally d) Frequently  e) Nearly all the time