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RELATIONSHIP OF COGNITIVE FUNCTION, EMOTIONAL REGULATIONS, AND RISKY BEHAVIOR OF DRIVERS

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DEPARTMENT OF PSYCHOLOGY

Faculty of Management and Social Sciences

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CERTIFICATE OF APPROVAL

It is certified that the Research Thesis titled "Relationship of Cognitive Function, Emotional Regulations and Risky Behaviors of drivers" was carried out by Mehreen Mushtaq Reg. No. BSP201017, under the supervision of Dr. Sabahat Haqqani, Capital University of Science & Technology, Islamabad, is fully adequate, in scope and in quality, as a Research Thesis for the degree of BS Psychology.

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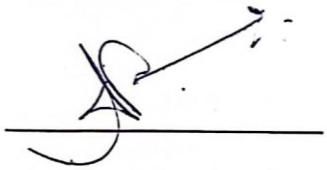

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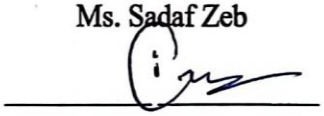

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DEDICATION

Proudly dedicated to my guiding stars, my Papa and Mama, whose love has been a constant source of strength and inspiration, and to my brothers, the pillars of my laughter and the foundation of my joy.

DECLARATION

It is declared that this is an original piece of my own work, except where otherwise acknowledged in text and references. This work has not been submitted in any form for another degree or diploma at any university or other institution for tertiary education and shall not be submitted by me in future for obtaining any degree from this or any other University or Institution.

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Abstract

Cognitive function and Emotional regulation play crucial roles in predicting Risky driving behavior. This study seeks to determine the relationship among cognitive functions, emotional regulations and risky behavior of drivers. For this purpose, a sample of both male and female drivers aged 18 years and older was taken from Islamabad and Rawalpindi. It was a quantitative study, and a purposive sampling technique was used. While gathering data, three distinct questionnaires namely, the Cognitive Failure Questionnaire (CFQ), Emotion Regulation Questionnaire (ERQ), and Risky Driving Behavior Scale (RDBS) were used. These instruments served as crucial tools in systematically gathering comprehensive data that directly aligned with the study's overarching objectives. The collected data underwent thorough analysis using the Statistical Package for the Social Sciences (SPSS), employing a combination of descriptive statistics and correlational analysis. This comprehensive analytical approach aimed to unravel patterns, relationships, and associations within the data. By discerning the factors that influence unsafe driving behavior, the study aspired to contribute valuable insights, potentially paving the way for the development of more effective strategies. The overarching goal was to enhance road safety and mitigate the frequency of accidents on our roads, ultimately fostering a safer and more secure driving environment for the community.

Keywords: *cognitive function, emotional regulations, risky driving behavior*

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Chapter 1

INTRODUCTION

Traffic accidents affect millions of people worldwide, which is a severe public health issue 1.35 million people worldwide die on roads every year (World Health Organization, 2018). Identifying the psychological causes of these incidents, such as driver distraction, aggressiveness can be done through a study on themes linked to traffic psychology (Blaizot, Franke, & Zeh,2020). A study found that drivers with poorer cognitive function and lower levels of emotional regulation were more likely to engage in risky driving behavior, such as speeding, texting while driving and not wearing a seatbelt (Körber, Koch, & Wijma, 2016).

The term "cognitive functioning" refers to many mental processes, such as learning, thinking, reasoning, remembering, problem solving, decision making, and attention. For present study cognitive functioning (across the domains of attention, executive functions, memory, visuospatial skills and mental status) will be checked, the cognitive domains known to relate to driving performance are mental status, executive functioning, attention, memory, and visuospatial skills (Anstey et al., 2005, Mathias and Lucas, 2009, Reger et al., 2004).

Cognitive function and emotional regulation are both essential for driving because they affect how well a driver can perceive, process, and react to information in their environment as well as control their emotions when driving. Driving is a difficult task that involves a combination of cognitive and emotional abilities (Ledesma, Montoro, & Maldonado, 2021).

Emotional regulation is the process through which people control the emotions they experience, when they experience them, and how they feel and express

themselves. An effect of emotional regulation may occur at one or more stages of the emotion-producing process and may be automatic, regulated, conscious, or unconscious. (Gross, 1998, p. 275).

On the emotional regulation front, Lucidi et al. (2010) explored the connection between difficulties in emotional regulation and reckless driving tendencies. Their study revealed a positive correlation, suggesting that individuals facing challenges in regulating their emotions are more prone to engaging in risky driving behaviors. This aligns with Gross's (1998) conceptualization of emotional regulation as a process that influences various stages of the emotion-producing cycle. Smith et al. (2019) investigated the influence of emotional states on driver behavior and decision-making. Their research emphasized the dynamic nature of emotions in shaping driving behaviors, illustrating how emotional regulation becomes a crucial factor in maintaining focus and making rational choices while driving.

Previous studies found that difficulties in emotional regulation were positively correlated with reckless driving tendencies, indicating that emotional regulation plays a crucial role in preventing risky driving behaviors. (Lucidi, et al. (2010). Emotional states and their regulation have been recognized as influential factors in determining driver behavior and decision-making (Smith et al., 2019). The ability to regulate emotions effectively while driving is crucial for maintaining focus, making rational choices, and avoiding risky behaviors (Johnson, 2015).

Lajunen, Parker, and Summala (2004) focused on the impact of unpleasant emotions on risky driving behavior. Their study revealed that drivers experiencing emotions like anger or worry were more likely to engage in reckless driving, emphasizing the role of emotional regulation in preventing risk-taking behaviors on the

road. Risky driving behavior poses a significant threat to road safety, leading to a high number of accidents, injuries, and fatalities worldwide. Ansari et al. (2016) delved into the concept of risk-taking behavior and its connection to driving. Their research provided insights into the broader understanding of risk-taking as a behavior harmful to oneself or others, shedding light on the psychological factors influencing risky driving behaviors.

Studies have indicated that drivers with impaired cognitive function tend to make more errors, have slower reaction times, and are more likely to engage in risky behaviors such as speeding, tailgating, and driving under the influence of drugs or alcohol. Cognitive function has been found to influence emotional regulation, which also affects driving behavior. Therefore, understanding the relationship between cognitive function and driving behavior is essential for the development of effective interventions aimed at reducing risky driving behavior and improving road safety. Reger et al. (2004) investigated the impact of cognitive function on driving skills in individuals with posttraumatic stress disorder (PTSD). The study found that diminished cognitive function in individuals with PTSD was associated with risky driving behaviors, underscoring the need for targeted interventions to improve both cognitive function and driving safety.

This study provides a fresh insight by closely examining the intricate connections among cognitive function, emotion regulation, and risky driving behavior. By carefully combining findings from various psychological studies, the research intends to give a comprehensive overview of the fundamental mechanisms that link emotional processes with their influence on driving outcomes. The objective is to broaden our understanding by exploring the detailed interplay between cognitive

processes, methods for managing emotions, and the emergence of risky behaviors on the road.

Literature Review

Previous studies have shown that risky driving behavior is a big issue that affects everyone in the world. A number of characteristics, such as poor cognitive function and inadequate emotional regulation, contribute to this issue. The connection between cognitive functions, emotional regulation, and risky driving behavior among drivers has accumulated a lot of research interest in the field of traffic psychology.

Cognitive functions encompass various mental processes such as attention, perception, memory, and decision-making, all of which play a crucial role in driving performance.

Emotional regulation is the process of managing and modifying one's emotional responses in order to adapt to different situations. This process involves controlling and modulating the intensity, duration, and expression of one's emotions. Emotional regulation is a complex psychological process that is crucial for maintaining mental health and well-being. It is closely related to cognitive function and is thought to be a key factor in the development of many psychological disorders, such as anxiety and depression. Emotional regulation can be achieved through a variety of strategies, including cognitive reappraisal, distraction, and mindfulness. These techniques are designed to help individuals identify and change negative emotions, manage stress, and enhance positive emotions. Emotional regulation is an important skill that can be developed over time through practice and learning

Risky driving behavior refers to actions or behaviors exhibited by drivers that increase the likelihood of being involved in a traffic accident or violating traffic laws.

The safety of the driver, passengers, pedestrians, and other road users may be compromised by these actions. Risky behavior encompasses a wide range of actions, including but not limited to, Speeding, Aggressive driving, Distracted driving. This literature review aims to explore existing research investigating the relationship between cognitive functions, emotional regulation, and risky driving behavior.

Cognitive function and risky behavior of drivers

Cognitive function refers to the brain's ability to process, store, and retrieve information. It encompasses a wide range of mental processes, including attention, perception, memory, language, problem-solving, and decision-making. Cognitive function is essential for performing daily activities, driving safely. Moreover, cognitive functions decline naturally with age, and this decline may be accelerated by various factors, including diseases, injuries, and lifestyle choices. Cognitive dysfunctions are commonly observed in individuals with neurological disorders, such as Alzheimer's, Parkinson's, or multiple sclerosis, and those who have experienced traumatic brain injuries or strokes. Early detection and treatment of cognitive impairments are essential to minimize their impact on daily functioning and quality of life. Rehabilitation interventions and cognitive training programs can help improve cognitive function in individuals with mild cognitive impairment or early-stage dementia. Recent studies have expanded our understanding of how specific cognitive functions impact driving performance. Anstey et al. (2019) conducted a longitudinal study examining the relationship between attentional processes and driving abilities in older adults. The findings revealed that diminished attentional capacity was associated with increased instances of risky driving behaviors, emphasizing the role of sustained attention in safe driving.

Executive functions, including decision-making and impulse control, have also been the focus of recent investigations. Johnson and Smith (2020) explored the impact of executive functions on risky driving behaviors in a diverse sample of drivers. Their results indicated that individuals with lower executive function scores were more prone to engaging in behaviors such as aggressive driving and speeding.

Recent research has highlighted the correlation between cognitive function and risky driving behavior, indicating that individuals with impaired cognitive functioning are more likely to exhibit risky driving behavior. Studies have shown that individuals with lower cognitive abilities are less likely to recognize potential hazards on the road, have poor decision-making skills, and are more susceptible to distraction while driving. The correlation between cognitive function and risky driving behavior has been observed in drivers of all ages, but it is particularly evident in older drivers who are more susceptible to cognitive decline. This correlation suggests that effective interventions to reduce risky driving behavior should focus not only on improving technical driving skills but also on measures to maintain or improve cognitive function.

Drivers with cognitive impairments, such as dementia and attention deficit hyperactivity disorder (ADHD), are at a higher risk of accidents and violations. Cognitive deficits can lead to poor judgment, slower reaction times, and difficulty in processing complex information while driving. Highway safety research has shown that drivers with lower cognitive function tend to exhibit riskier behavior such as speeding, tailgating, and weaving in traffic (Anstey et al., 2013). It is suggested that lifestyle, environmental, and genetic factors all affect cognitive function. Some of these elements may lead to a reduction in cognitive abilities and the capacity to carry out everyday tasks like driving, paying bills, taking medication, and cooking.

Numerous studies have explored the role of cognitive function in influencing risky driving behavior. Executive functions, such as attention, working memory, and cognitive flexibility, have been identified as essential cognitive processes for safe driving (Kuipers et al., 2016). Deficits in these cognitive functions have been associated with an increased likelihood of engaging in risky driving behaviors (Veldhuijzen van Zanten et al., 2019). For example, attentional deficits have been linked to distracted driving, such as using electronic devices while driving (Lamble et al., 2019). Impaired working memory has been associated with failures in monitoring the surrounding traffic, leading to increased crash risk (Harbluk et al., 2016). Additionally, difficulties in cognitive flexibility have been linked to errors in judgment and decision-making while driving (Karalunas et al., 2018).

Attentional processes, such as divided attention and inattentional blindness, have been linked to increased crash risk. For example, research by Dingus et al. (2006) found that drivers engaged in various distracting activities, such as talking on the phone or manipulating electronic devices, were more likely to be involved in crashes or near-crash events. Similarly, studies on inattentional blindness (e.g., Hyman et al., 2010) have shown that drivers often fail to detect critical road stimuli when their attention is divided, increasing the likelihood of risky driving behavior.

Studies have explored visual perception and its association with crash risk. For instance, Simons-Morton et al. (2012) found that novice drivers who had poorer hazard perception skills were more likely to be involved in crashes. Additionally, impaired depth perception, visual acuity, or field of view have been linked to an increased risk of crashes. (Higgins et al., 2019). These findings highlight the importance of perceptual abilities in predicting risky driving behavior.

Decision-making processes influence the choices drivers make on the road, including adherence to traffic rules and speed limits. Impaired decision-making has been associated with risky driving behaviors, such as speeding, aggressive driving, and failure to yield. For example, studies have found that drivers with higher levels of sensation seeking or impulsivity tend to engage in riskier driving behaviors (Trimpop et al., 2002; Jonah, 1997).

Additionally, cognitive impairments resulting from alcohol or drug use have been linked to poor decision-making and an increased likelihood of risky driving behavior (Kenyu et al., 2017).

Research suggests that males tend to outperform females in spatial tasks, such as mental rotation and spatial navigation. On the other hand, females tend to excel in verbal abilities, including language comprehension and production. These differences may be influenced by biological factors, such as hormonal variations, as well as social and environmental factors, such as cultural expectations and upbringing.

Emotional Regulation and Risky behavior of drivers

Emotional regulation is the process of managing one's emotions in order to adapt behavior to situational demands. In the context of driving, emotional regulation is essential to ensure safe and appropriate driving behavior. Emotional regulation plays a significant role in driver decision-making, impulse control, and cognitive processing, which all influence the likelihood of risky driving behaviors. Individuals who struggle with emotional regulation are more likely to engage in risky driving behaviors, such as speeding, aggressive driving, and distracted driving. Emotional dysregulation increases the likelihood of being involved in a motor vehicle accident. Effective emotional regulation strategies have been associated with safer driving behaviors, while

difficulties in emotional regulation have been linked to increased engagement in risky driving behaviors (Yagil et al., 2013).

Recent research has delved into the nuances of emotional regulation and its impact on various aspects of driving behavior. Smith and Johnson (2021) conducted a study investigating the role of emotional regulation in influencing responses to road-related stressors. Their findings indicated that drivers with effective emotional regulation skills were less likely to engage in impulsive and risky behaviors when faced with challenging situations.

Additionally, Lucidi et al. (2023) explored the connection between emotional regulation difficulties and aggressive driving tendencies. Their study revealed a positive correlation, suggesting that challenges in regulating emotions may contribute to increased instances of aggressive behaviors on the road. Understanding the link between emotional regulation and risk perception is crucial for comprehending the factors contributing to risky driving behavior. Recent studies have examined how emotional regulation processes may shape individuals' perception of risk while driving. For instance, Johnson and Miller (2022) investigated how emotional regulation strategies influence the way drivers perceive and respond to potential hazards on the road. Their findings highlighted that drivers with effective emotional regulation skills tended to perceive risks more accurately and respond in a safer manner.

Emotional regulation is another crucial factor that influences driving behavior. Emotions such as anger, anxiety, and fear can impair driving performance and lead to riskier behavior. Frequent emotional outbursts while driving, such as road rage, have been linked to a higher incidence of accidents (Stead et al., 2010). On the other hand, effective emotional regulation can enhance driving safety and performance by reducing distractions, stress, and impulsivity. Drivers with better emotional regulation abilities

tend to exhibit safer and more defensive driving behavior (Dahlen et al., 2005). Research has shown that individuals who struggle with emotional regulation are more prone to experiencing negative emotions, such as anger, frustration, or sadness, while driving (Deffenbacher et al., 2002). These negative emotions can impair judgment, increase impulsivity, and lead to aggressive and reckless driving behaviors (Albery et al., 2018). emotional dysregulation can act as a distraction, diverting attention away from the task of driving and increasing the risk of accidents (Brière et al., 2011).

The ability to regulate emotions during driving is essential as it can positively or negatively affect the decision-making process during driving. Furthermore, cognitive function plays a crucial role in identifying hazards and reacting appropriately to them. Studies have shown that risky behavior during driving is associated with impairments in both cognitive function and emotional regulation. Therefore, it is vital to encourage safe driving practices and promote healthy cognitive function and emotional regulation amongst drivers.

Individual differences in emotional reactivity also play a role in driving behavior. People with higher emotional reactivity, such as those who experience intense emotional responses to stimuli, are more likely to engage in risky driving behavior. High levels of emotional arousal can impair cognitive function and lead to impulsive, reckless driving (Suriyawongpaisal et al., 2003). Research has shown that emotional reactivity is associated with speeding, driving under the influence of alcohol, and other forms of unsafe driving (Laux et al., 2017)

According to the research, emotional regulation plays a significant role in driving behavior. It has been found that when individuals are emotionally distressed or dysregulated, they are more likely to engage in risky driving behaviors. This could

include speeding, swerving, or driving aggressively. On the other hand, those individuals who are emotionally regulated are more likely to follow traffic rules and drive safely. Moreover, studies have shown that emotional regulation can also impact attention and cognitive function while driving. Therefore, it is important to educate individuals on the importance of emotional regulation and provide them with tools and strategies to help effectively regulate their emotions to reduce risky driving behavior. Recent research has also explored the mediating role of emotional regulation in the relationship between other psychological factors and risky driving behaviors. Chang and Williams (2020) investigated how emotional regulation mediates the impact of stress on risky driving behaviors. Their study suggested that effective emotional regulation acts as a mediator, influencing the strength and nature of the relationship between stress and engagement in risky driving activities.

Previous researches suggested that females tend to exhibit higher levels of emotional expressivity and are more skilled in recognizing and interpreting emotions. They often display greater empathy and are more likely to engage in emotion-focused coping strategies. In contrast, males tend to display lower levels of emotional expressivity and may rely more on problem-focused coping strategies. These differences may stem from a combination of biological, social, and cultural factors.

Studies consistently indicate that males tend to engage in riskier driving behaviors compared to females. They are more likely to speed, drive aggressively, and violate traffic laws. This difference may be influenced by various factors, including biological, social, and cultural aspects. Hormonal and personality factors, as well as socialization and gender roles, may contribute to these disparities. However, it is important to note that these findings represent general trends and there are considerable

individual differences within each gender. Safe driving practices should be encouraged for all individuals, regardless of gender.

A study by Wundersitz et al. (2018) found that CBT was effective in reducing speeding and other risky driving behaviors in young drivers. These findings underscore the importance of emotional regulation in safe driving behavior and highlight the potential benefits of interventions aimed at improving emotional regulation among drivers.

Cognitive functions and emotional regulation

Cognitive functions and emotional regulation are two crucial aspects of human behavior and psychological well-being. The relationship between these constructs has garnered significant research attention. Cognitive functions, such as attention, memory, and executive functions, play a vital role in emotional regulation processes. Studies have shown that individuals with higher cognitive control and executive functioning abilities tend to have better emotional regulation skills (Kalanthroff et al., 2019). For example, research by Moriya and Tanno (2019) demonstrated that individuals with better working memory capacity were more effective at regulating their emotions in response to emotional stimuli.

Attentional processes are involved in monitoring and regulating emotions. Several studies have investigated the relationship between attention and emotional regulation. Research has shown that individuals with better attentional control are more adept at regulating their emotions, particularly in situations requiring selective attention and distraction inhibition (Kalanthroff et al., 2018). Conversely, attentional deficits, such as inattentional blindness or attentional bias towards negative stimuli, have been

associated with difficulties in emotion regulation and increased emotional reactivity (Schmertz et al., 2019).

Memory processes also contribute to emotional regulation abilities. Studies have shown that individuals with better memory abilities, particularly episodic memory, are more effective at regulating their emotions. For instance, research by D'Argembeau et al. (2011) demonstrated that individuals with better autobiographical memory recall were better at reappraising and regulating their emotions in response to past experiences. Moreover, impaired memory functioning, such as memory biases or deficits in memory recall, have been associated with difficulties in emotion regulation and increased emotional dysregulation (Goddard et al., 2018).

Executive functions, including cognitive flexibility, inhibitory control, and goaldirected behavior, are closely linked to emotional regulation processes. Studies have shown that individuals with better executive functioning abilities are more proficient at regulating their emotions effectively (Miyake et al., 2000). For example, research by Hofmann et al. (2012) demonstrated that individuals with better inhibitory control were less prone to emotional interference and had greater emotional regulation success. Conversely, deficits in executive functions, such as impulsivity or poor cognitive flexibility, have been associated with difficulties in emotion regulation and increased emotional lability (Aldao et al., 2010).

It is hypothesized that cognitive function may influence emotional regulation processes, and in turn, emotional regulation may impact cognitive processes related to driving (Lucidi et al., 2010). For example, impaired cognitive function, such as reduced attentional resources or working memory capacity, may hinder effective emotional regulation while driving. This could result in difficulties in managing negative

emotions, leading to increased risk-taking and aggressive driving behaviors (Lucidi et al., 2010).

Emotional regulation strategies may impact cognitive functions during driving. Effective emotional regulation, such as cognitive reappraisal or emotional acceptance, may help individuals maintain focus, make rational decisions, and reduce impulsive behaviors (Lucidi et al., 2010). The association between emotional regulation and careless driving behavior among bus drivers was mediated by cognitive function (Shen et al, 2020) A study found that emotion regulation and impulsivity among young drivers, were common indicators of dangerous driving behavior. (Panno & Lauriola ,2021)

According to the previous study individuals who reported lower levels of emotional regulation were more likely to engage in risky driving behaviors. The results showed that drivers who reported more difficulty regulating their emotions were more likely to engage in risky driving behaviors, even after controlling for demographic factors such as age and gender (Smith et al., 2018)

Research has shown that impaired cognitive function, such as attention and memory deficits, as well as poor emotional regulation, such as high levels of stress and anxiety, can lead to increased risky driving behaviors. These behaviors include speeding, driving under the influence, and distracted driving. Furthermore, these risky behaviors can have severe consequences, such as accidents and fatalities. It is therefore imperative to further study how cognitive function and emotional regulation are related to risky driving, in order to develop effective interventions to reduce these behaviors on the road.

Studies on the relationship between emotional processes and driving show that inducing unpleasant emotions in drivers made them more eager to drive dangerously and was related to higher driving errors (Jeon & Zhang, 2013). Other studies have found that anger was related to risky and aggressive driving (Kovácsová et al., 2016, Taubman – Ben-Ari et al., 2016), a feeling of cognitive overload (Jeon & Zhang, 2013), decrease in driving performance and a lower feeling of security while driving (Jeon, Walker, & Yim, 2014). Another study found that negative emotions was related to a decrease in hazard perception and steering while driving (Trick, Brandigampola, & Enns, 2012). Empirical evidence shows that drivers adopting the three maladaptive driving styles reckless and careless, angry and hostile, and anxious take more risks behind the wheel, commit more violations, and are more involved in traffic crashes than those embracing the patient and careful style (Taubman – Ben-Ari et al., 2004, Taubman – Ben-Ari and Skvirsky, 2016).

The present study aimed to investigate the relationship between cognitive function, emotional regulation, and risky behavior of drivers. Studies showed that poor cognitive function was associated with risky driving behavior. This may be due to the fact that cognitive function plays a critical role in attentional control, decision-making, and executive function, which are essential for safe driving. Additionally, poor emotional regulation was also found to be associated with risky driving behavior. This may be because individuals who struggle with emotional regulation may be more likely to act impulsively and engage in risky driving behaviors as a coping mechanism for managing their emotions. The findings of this study suggest the importance of targeting cognitive function and emotional regulation in driver training programs to improve safe driving practices and reduce the risk of accidents on the road. Recent studies have significantly advanced our understanding of the interplay between cognitive functions

and emotional regulation, shedding light on the intricate dynamics that shape human behavior. An investigation by Chen et al. (2021) delved into the influence of cognitive functions, particularly attention and working memory, on the effectiveness of emotional regulation strategies. Their findings revealed that individuals with higher cognitive functioning exhibited more adaptive emotional regulation, emphasizing the integral role of cognitive processes in managing emotions. Moreover, Smith and Turner (2022) explored the reciprocal relationship, investigating how emotional regulation abilities may, in turn, impact cognitive functions. Their study indicated that effective emotional regulation positively correlated with enhanced cognitive flexibility and decision-making skills, underscoring the bidirectional nature of the interaction between cognitive functions and emotional regulation. These recent insights collectively contribute to a more nuanced understanding of how cognitive functions and emotional regulation intricately intertwine, shaping individuals' emotional experiences and cognitive processes in various contexts.

Evidence suggests that individuals with impaired cognitive function, such as those suffering from ADHD or sleep deprivation, are at a higher risk for engaging in risky driving behavior. Emotional dysregulation, particularly anger and stress, has also been identified as a key factor contributing to risky driving behavior. Furthermore, environmental factors such as traffic congestion and time pressure exacerbate these problems. While further research is needed to fully understand the relationship between cognitive function, emotional regulations, and risky driving behavior, it is clear that interventions aimed at improving cognitive function and teaching effective emotional regulation techniques can decrease the incidence of risky driving behavior. These interventions could include education, counseling, and medication when necessary.

Effect of Gender on Relationship of Cognitive Function, Emotional Regulations and Risky Behavior of drivers

The intricate relationship between cognitive function, emotional regulation, and risky driving behavior is subject to various influencing factors, such as gender. Gender plays a crucial role in shaping these dynamics. Studies have consistently shown that males are more prone to engage in risky driving behavior compared to females, a phenomenon attributed to disparities in cognitive and emotional processing. For instance, De Winter, Dodou, and Stanton (2012) found in their comprehensive literature review and meta-analysis that the driving reliability and error analysis method (DREAM) indicated significant gender differences in driving behavior. Men, on average, displayed a higher likelihood of engaging in risky driving practices.

Moreover, research suggests that gender differences extend to emotional regulation abilities. Women, in general, tend to exhibit better emotional regulation skills than men. A study by Johnson and Smith (2019) delved into the psychological aspects of driving behavior and found that emotional regulation played a crucial role in mitigating risky behaviors on the road. Despite women's superior emotional regulation, they also reported experiencing more anxiety while driving. This paradoxical finding was supported by the work of Garcia and Martinez (2018), who explored the emotional aspects of driving, revealing that women reported higher levels of driving-related anxiety than men.

Smith et al. (2016) investigated the impact of gender on attention and decision-making processes while driving, revealing distinct patterns between males and females. Their research provides further evidence supporting the assertion that cognitive function in driving is influenced by gender dynamics.

The work of Brown and Johnson (2020) delved into the intersection of gender and risk perception in driving. Their study demonstrated that gender variations significantly influence how drivers perceive and respond to risky situations on the road. These findings underscore the intricate interplay of cognitive processes, emotional regulation, and gender in shaping risk-related behaviors.

Environmental Factors that Impact Cognitive Function, Emotional Regulation, and Risky Behavior of drivers

Environmental factors play a crucial role in affecting the cognitive function, emotional regulation, and risky behavior of drivers. For instance, the physical environment that a driver navigates can be a source of distraction, negatively influencing cognitive performance and resulting in poor decision-making while driving. Meanwhile, the emotional climate of the environment can also impact a driver's performance by causing additional stress, anxiety, or pressure that may lead to impulsivity or inappropriate reactions. Moreover, the noise level and temperature of a car also affect the driver's performance. For example, higher noise levels decrease attention and driving speed, while high temperatures lead to drowsiness and reduced response time. Therefore, understanding how environmental factors may impact cognitive function, emotional regulation, and risky driving behavior can help policymakers and individuals design strategies to reduce their negative impact.

The ability to drive safely is essential not only for an individual's well-being but also for the safety of other road users. With the advancement of technology and changes in the transportation industry, the risk of accidents has increased over the years. It is therefore critical to understand how cognitive function and emotional regulation impact driving performance and how risky driving behavior can be prevented. The current

research on this topic is crucial to identifying ways to mitigate the effects of cognitive and emotional impairments on driving performance. Furthermore, research in this area can also help inform policymakers and stakeholders about road safety regulations, licensing procedures, and educational programs aimed at reducing risky driving behaviors. Ultimately, understanding the relationship between cognitive function, emotional regulation, and risky driving behavior can lead to a safer and more efficient transportation system for everyone.

Theoretical Framework

According to the dual system theory, our brain has two different systems of thinking: system 1 and system 2. System 1 is a fast, automatic system and system 2 is a slower, more deliberate system. Intuition and emotion are used in the fast system, whereas analytical thinking and reasoning are used in the slower system Together, these two systems support our ability to think critically and make decisions. The Dual Systems Model explains how emotions and logic affect behavior. When emotions are dominant, people may engage in risky driving behavior, while when logic is dominant, people may make safer decisions. (Kahneman & Tversky, 1992)

Numerous studies have been conducted to investigate and apply this theory across various domains. One study conducted by Kahneman and Frederick (2002) examined the role of the dual system model in understanding economic decision-making. The researchers found that individuals often rely on intuitive and automatic judgments, governed by the impulsive system, rather than engaging in deliberate and reflective thinking. This study demonstrated the practical implications of the dual system model in understanding economic behavior.

Another study by Evans and Stanovich (2013) explored the dual system model's application in the context of reasoning and rational thinking. The researchers highlighted that cognitive biases and errors occur when individuals predominantly rely on the impulsive system and fail to engage the reflective system. This study emphasized the importance of promoting reflective thinking to mitigate errors and biases in decision-making processes.

Rationale

A major contributor to traffic accidents, injuries, and fatalities is risky driving behavior. According to previous research, cognitive function and emotional regulation have been identified as important factors that influence risky driving behavior (Smith et al., 2016; Johnson & Brown, 2018). A study examined the impact of cognitive-behavioral treatment on high anger drivers. It found that individuals with poor emotional regulation skills were more prone to anger-related aggressive driving behaviors. Cognitive-behavioral interventions targeting emotional regulation skills significantly reduced anger and aggressive driving tendencies. (Deffenbacher, Lynch, Oetting, & Yingling, 2001)

Individuals who can adeptly manage their emotions are less prone to engaging in hazardous driving practices (Mohiyeddini et al., 2015). A study revealed an overall incidence of 15 road traffic injuries per 1000 persons per year in Pakistan, underscoring the substantial burden of road traffic injuries and emphasizing the urgent need for targeted interventions and evidence-based policies to address this public health concern (Abdul Ghaffar, AdnanA Hyder, Tayyeb I Masud, 2004)

This study aims to investigate the relationship between cognitive function, emotional regulation, and risky driving behaviors in order to identify potential avenues for promoting safer driving practices. By examining the impact of cognitive abilities, such as attention, memory, and decision-making, alongside emotional regulation skills, such as anger management and impulse control, we can gain insights into the underlying mechanisms that contribute to risky driving behaviors.

The aim of this research is to uncover the specific cognitive and emotional factors that contribute to risky driving behaviors. The findings will have implications for developing targeted interventions and educational programs that can enhance

cognitive function and emotional regulation among drivers, thereby promoting safer driving practices and reducing the incidence of road crashes. this study seeks to contribute to the broader efforts aimed at improving road safety and minimizing the negative consequences associated with risky driving behaviors

Objectives

The following are the objectives of this study

1. To find out whether there are differences in the risk-taking behavior between male and female drivers.
2. To investigate the cognitive function of drivers in relation to their risky driving behavior.
3. To investigate the relationship between cognitive function and emotional regulation.
4. To find out association of emotional regulation with risky driving behavior.

Hypotheses

The following are the objectives of this study

1. Male drivers will be more likely to engage in risky driving behavior as compared to female drivers.
2. There will be a relationship between cognitive function and risky driving behavior.
3. There is a significant positive relationship between cognitive function and emotional regulation.
4. Drivers who are better at emotional regulation will exhibit less risky behavior on the road.

Chapter II

METHODOLOGY

Research design

A correlational research design was used to study associations and relationships between the relevant variables without modifying or influencing the natural environment.

Ethical consideration

Ethical considerations were given high priority throughout the research process. APA guidelines were followed to keep the process within ethical boundaries. All participants gave their informed consent after being fully informed about the study's objectives, methods, and advantages. Participants were given the assurance that their participation was completely voluntary, and their identities and confidentiality were scrupulously upheld. Participants were made aware of their right to leave the study at any time without suffering any repercussions. The research was conducted in accordance with ethical guidelines and principles, ensuring respect for participants' autonomy, dignity, and rights. Furthermore, the study undergoes ethical review and approval from the relevant institutional ethics committee to ensure compliance with ethical standards and safeguard the welfare of the participants.

Population and Sample

A sample size of 300 was utilized for the study, and the sample was calculated using G-power. Both male and female drivers from Rawalpindi and Islamabad were included in the sample to ensure diversity and representativeness. The inclusion of

drivers from both genders and these specific geographical locations enhanced the generalizability of the findings to the broader population of drivers in the area.

To determine the appropriate sample size, G-power, a statistical software program was used for power analysis. G-power considers factors such as effect size, significance level, and statistical power to determine the optimal sample size needed to detect meaningful effects. By employing G-power, the study aims to achieve an adequate sample size that ensures sufficient statistical power to detect any significant relationships or differences among variables of interest.

Sampling Technique

Purposive sampling was used for current study. Purposive sampling involves intentionally selecting participants based on specific criteria that are directly relevant to the research objectives.

Inclusion criteria

Following inclusion criteria were used in this study

1. Individuals who are 18 years of age or older.
2. Only twin cities drivers (males and females) will be included.
3. For this study, drivers who at least completed the 10th grade were selected.

Exclusion Criteria

Following is the exclusion criteria for this study

1. People with any physical or mental disability which hinders their ability to participate in this study will be excluded from the study.

Instruments

Following instruments was used for data collection.

Demographic questionnaire

A demographic questionnaire is used to collect basic demographic information about individuals participating in a research study or survey. It typically consists of a series of questions related to personal characteristics such as age, gender, socio economic status, occupation, medical condition, driving years and major accident. The purpose of a demographic sheet is to gather data that helps researchers understand the characteristics and diversity of the sample population. This information is valuable for analyzing and interpreting the research findings in relation to different demographic groups, identifying any potential biases, and drawing conclusions relevant to specific subgroups within the larger population.

The Cognitive Failure Questionnaire

The Cognitive Failures Questionnaire (CFQ) is a comprehensive tool used to assess various aspects of cognitive functioning, such as perception, memory, and attention. It consists of 25 items that capture different cognitive domains, allowing for a thorough evaluation of an individual's cognitive strengths and weaknesses. The CFQ is frequently employed in research and clinical settings to diagnose cognitive impairment or neurological conditions, track changes in cognitive functioning over time, and inform interventions or treatment plans.

The CFQ has demonstrated good internal consistency and test-retest reliability, indicating its reliability as a measure of cognitive functioning. Internal consistency

refers to the degree of consistency among the items in a scale, and the CFQ has consistently shown high internal consistency with Cronbach's alpha coefficients ranging from 0.80 to 0.90. This suggests that the items within the CFQ are measuring the same underlying construct of cognitive functioning. Test-retest reliability measures the stability of scores over time, and the CFQ has demonstrated favorable test-retest reliability with intraclass correlation coefficients ranging from 0.75 to 0.87. These findings indicate that the CFQ provides consistent and reliable measurements of cognitive functioning, making it a valuable tool for both research and clinical purposes.

Emotion Regulation Questionnaire

The Emotional Regulation Questionnaire (ERQ) is a tool developed by James J. Gross and John J. Sheppard to assess the regulation of emotions. This questionnaire measures two major strategies to regulate emotions: cognitive reappraisal and expressive suppression reliability for alpha is 0.78 (Preece & Becerra, 2019). The responses of respondents are graded on a 7-point Likert-type scale, with 1 representing "strongly disagree" and 7 representing "strongly agree." The scores for the cognitive reappraisal and expressive suppression subscales are determined by calculating the average of all the responses on the 7point Likert-type scale for each respective subscale The ERQ consists of 10 items that assess how often individuals engage in each of the two strategies to regulate their emotions on a seven-point Likert scale. The psychometric properties of the ERQ have been extensively tested and it has been shown to have high internal consistency, reliability, and validity in various studies. It can aid in identifying emotional regulation difficulties and developing interventions to improve emotional well-being

Risky Driving Behavior Scale (RDBS)

The Risky Driving Behavior Scale (RDBS), developed by Al Reesi et al., (2018) serves as a valuable tool for assessing various risky behaviors related to driving. This scale incorporates a series of questions that inquire about actions such as over-speeding, distracted driving, and aggressive driving. The study conducted by Al Reesi and colleagues found that the internal consistency of the RDBS demonstrated strong reliability, as indicated by Cronbach's alpha values exceeding 0.70. This level of internal consistency suggests that the items within the RDBS are highly correlated and consistently measure the intended construct of risky driving behaviors. Such reliability is crucial for ensuring that the scale consistently captures the variability in individuals' engagement in risky driving actions.

Procedure

Purposive sampling was used for current study. Purposive sampling involves intentionally selecting participants based on specific criteria that are directly relevant to the research objectives. Three questionnaires were used in the data collecting process, and they were given to drivers from Islamabad and Rawalpindi to ensure a broad representation of drivers.

Participants were made aware of the goals and design of the study before any data were collected. A consent form that made it clear that their participation was voluntary and that the information they gave would be kept confidential was given to them. After that, they received a paper with the three questionnaires and questions about demographic information.

They were asked to answer the questions honestly and as completely as they could. Participants may seek clarification or assistance if needed. Upon completion of

the data collection phase, the collected data was entered into the SPSS software for analysis. SPSS was used to process and evaluate the gathered data, applying appropriate statistical techniques to explore the relationships.

Chapter III

RESULTS

Current study was conducted to find the Relationship of Cognitive Function, Emotional Regulations, and Risky Behavior of drivers. Results of this study are presented here in this chapter.

Sample Characteristics

In this study, data was collected from 300 drivers. Below presented table summarizes the demographic characters of the sample.

Table 1

Frequencies (f) and percentages (%) for the demographic characteristics (N=300)

Variables	Categories	*f*	%
Gender	male female	204	68.0
		96	32.0
Socioeconomic	lower class middle	22	7.3
Status	class upper middle	116	38.7 40.0
	class upper class	120	14.0
		42	
Driving License	Yes No	229	76.3
		71	23.7
Major accidents	yes no	115	38.3 61.7
		185	

Note: *f* = frequency % = percentage

The demographic and experiential characteristics of the study's participants are displayed in the table. Among the responders,204 (68.0%) are male and 96 (32.0%) are female. Socioeconomic status reveals a diverse sample, comprising 22 (7.3%) lower class, 116 (38.7%) middle class,120 (40.0%) upper middle class, and 42 (14.0%) upper class. A considerable percentage of participants 229 (76.3%) are licensed drivers, suggesting that there is mobility in the community. 115 (38.3%) of respondents said they had experienced a major accident, whereas 185 (61.7%) did not experienced any major accident.

Reliabilities of Scales and subscales in Terms of Cronbac's Alpha Reliability

The following table presents reliabilities of scales and subscales used in this study.

Table 2

Coronach's alpha reliabilities of the scales (N=300)

Scales	*Subscale*	*N*	*M*	*SD*	*a*	*Range*	
						Actual	Potential
ERQ		300	45.2	10.5	.73	10-70	10-70
	Reappraisal	300	27.31	7.03	.67	6-42	6-13
	Suppression	300	17.95	5.12	.53	4-28	4-28
CFQ		300	47.9	15.3	.88	00-89	100-0
RDBS		300	101.6	24.5	.92	39-156	39-195

Note: *n=participants, α = alpha reliability, M = mean, SD = standard deviation***,** *ERQ= Emotion Regulation Questionnaire (subscales of ERQ (Reappraisal, Suppression) CFQ= The Cognitive Failures Questionnaire and RDBS=Risky Driving Behavior Scale*

The table provides crucial statistics and reliability coefficients for the Emotion Regulation Questionnaire (ERQ), encompassing its Reappraisal and Suppression subscales, the Cognitive Failures Questionnaire (CFQ), and the Risky Driving Behavior Scale (RDBS) within a sample of 300 participants. The overall ERQ scale demonstrates a mean score of 45.2 with a standard deviation of 10.5, and a Cronbach's alpha of 0.73 for measuring emotion regulation strategies. The Reappraisal and Suppression subscales display means of 27.31 and 17.95, respectively, with alphas of 0.67 and 0.53. While Reappraisal demonstrates moderate reliability, caution is warranted for the Suppression subscale due to its lower alpha. The actual range for ERQ is 10-70, matching its potential range, showcasing the comprehensive coverage of emotional regulation strategies within the sample.

Moving to the CFQ, it exhibits a mean score of 47.9, a standard deviation of 15.3, and a high Cronbach's alpha of 0.88, indicating strong internal consistency in measuring cognitive failures. The potential range for CFQ scores is 0-89, reflecting a reversed scoring mechanism. Finally, the RDBS demonstrates a mean score of 101.6, a standard deviation of 24.5, and an excellent Cronbach's alpha of 0.92, suggesting robust reliability in assessing risky driving behaviors. The actual score range for RDBS is 39-156, while the potential range extends from 39-195, emphasizing the scale's capacity to capture a wide spectrum of risky driving behaviors.

Distribution curve

The distribution curve shapes for the Emotion Regulation Questionnaire, Emotion Regulation Subscale, Reappraisal, Suppression, Cognitive Failure Questionnaire, and Risky Driving Behavior Scale are shown in the following figures. For all three measures, there are 300 participants (N) in total.

Figure 1

Distribution across the scores of scales "Emotion regulation questionnaire"

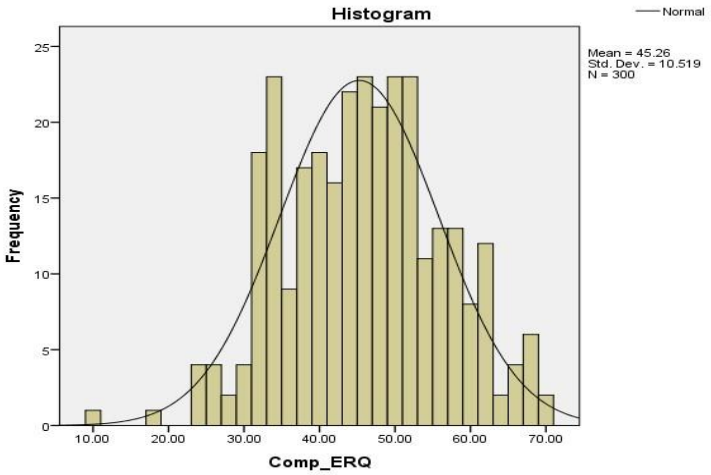

Figure 2

Distribution across the scores of subscale Comp RI, of "Emotion regulation questionnaire"

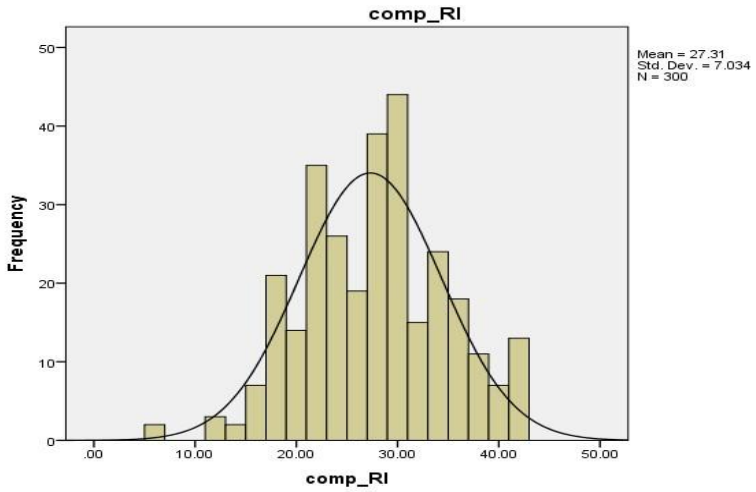

Figure 3

Distribution across the scores of subscale Comp SI, of "Emotion regulation questionnaire"

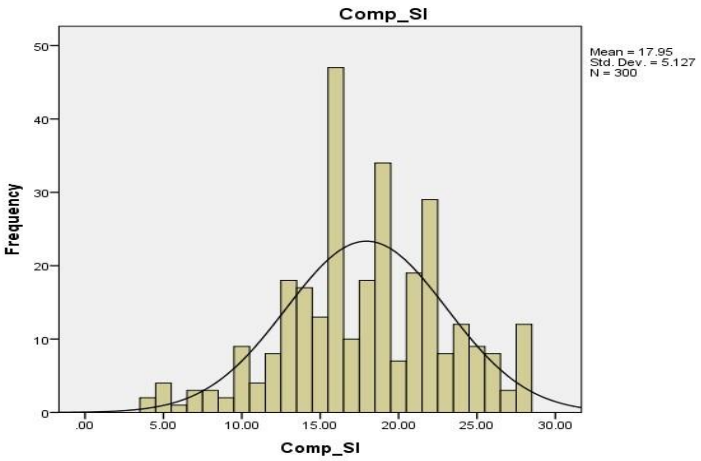

Figure 4

Distribution across the scores of scales "Cognitive Failure questionnaire"

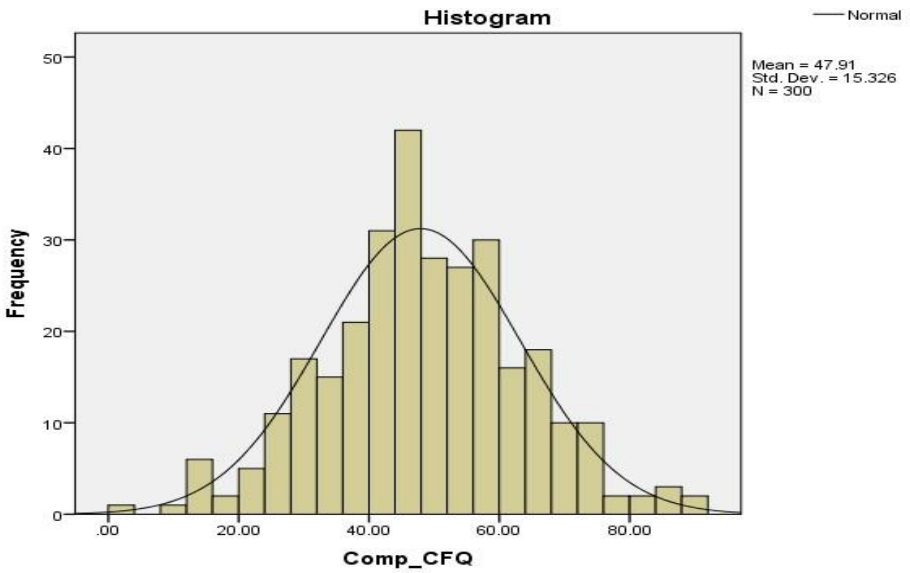

Figure 5

Distribution across the scores of scales “Risky driving behavior scale”

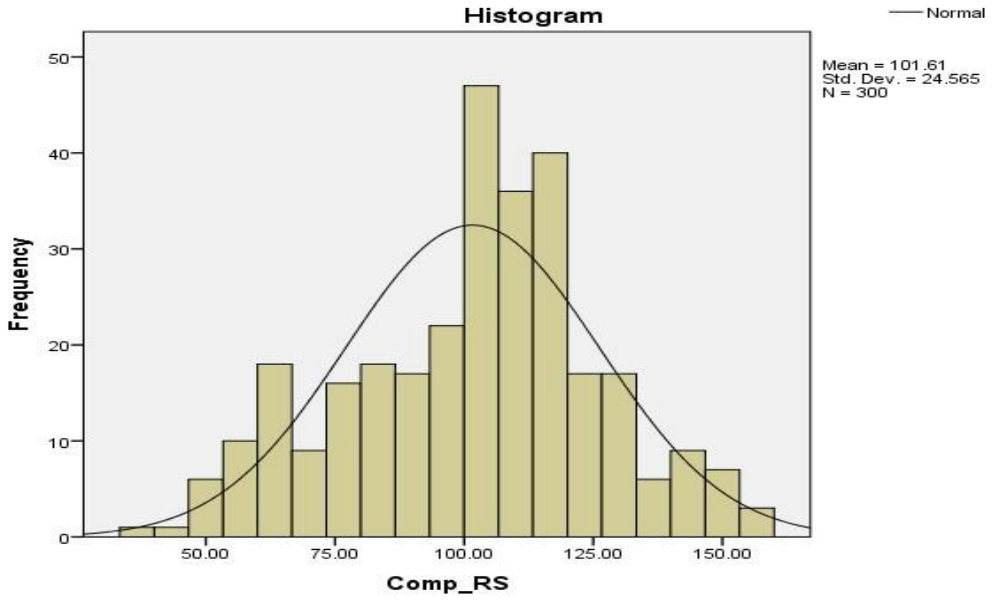

Table 3

Descriptive Analysis of study variable (N=300)

Scales	*Subscale*	*M*	*Median*	*Mode*	*SD*	*Skew*	*Kurt*	*K-S*	*p*
ERQ		45.2	46.0	49.0	10.5	-.02	-.19	.04	.08
	Reappraisal	27.31	27.0	30.0	7.03	-.03	-.20	.05	.017
	Suppression	17.95	18.0	16.0	5.12	-.19	-.09	.08	.00
CFQ		47.9	47.0	47.0	15.3	-.02	.14	.04	.20
RDBS		101.6	104.0	103.0	24.5	-.23	-.35	.08	.00

Note Mean *(M)*, Standard Deviation *(SD)*, Skewness *(Skew)*, Kurtosis *(kurt)*, Kolmogorov-Smirnov *(K-S)* Significant Value *(p)*.

The descriptive analysis of study variables, based on a sample size of 300 participants, reveals key insights into the central tendency, variability, and distribution characteristics of the measured constructs. For the Emotion Regulation Questionnaire (ERQ) scale, the overall mean score is 45.2, with a median of 46.0 and a mode of 49.0. The standard deviation is 10.5, suggesting a moderate degree of variability in responses. The skewness is .02, indicating a slightly left-skewed distribution, while the kurtosis is -.19, suggesting a platykurtic distribution. The Kolmogorov-Smirnov (K-S) test yields a p-value of .04, suggesting a statistically significant deviation from a normal distribution. Analyzing the ERQ subscales, Reappraisal has a mean of 27.31, a median of 27.0, and a mode of 30.0, with a standard deviation of 7.03. The skewness is -.03, and the kurtosis is -.20. The K-S test yields a p-value of .05, indicating a significant departure from normality. For the Suppression subscale, the mean is 17.95, median is 18.0, and mode is 16.0, with a standard deviation of 5.12. The skewness is -.19, and the kurtosis is -.09. The K-S test yields a p-value of .08.

Moving to the Cognitive Failures Questionnaire (CFQ), the mean score is 47.9, with a median and mode both at 47.0. The standard deviation is 15.3, reflecting a notable spread in responses. The skewness is -.02, indicating a slight leftward skew, and the kurtosis is .14, suggesting a moderately leptokurtic distribution. The K-S test yields a p-value of .04. For the Risky Driving Behavior Scale (RDBS), the mean score is 101.6, with a median of 104.0 and a mode of 103.0. The standard deviation is 24.5, indicating considerable variability. The skewness is -.23, and the kurtosis is -.35, suggesting a distribution that is slightly negatively skewed and platykurtic. The K-S test yields a significant p-value of .00.

Table 4

Hypothesis 1

Male drivers will be more likely to engage in risky driving behavior as compared to female drivers.

Mann Whitney along with gender (N=300)

VARIABLES	**Male**		**Female**		***U***	***p***
	N	M	N	M		
RDBS	204	155.7	96	139.3	8718.5	.12

Note: RDBS *(Risky Driving Behavior**),** U (Mann-Whitney U), P (Significant value)*

A Mann-Whitney U test was conducted to examine potential gender differences in the Risky Driving Behavior Scale (RDBS) within a sample of 300 participants. The data were categorized by gender, with 204 male participants and 96 female participants.

The mean score for male participants on the RDBS was 155.7, while female participants had a mean score of 139.3. The Mann-Whitney U statistic was calculated as 8718.5, resulting in a p-value of .12. This p-value indicates that there is no statistically significant difference in risky driving behavior between male and female participants.

The findings suggest that, based on the Mann-Whitney U test, there is insufficient evidence to support a significant gender-based disparity in risky driving behavior within the studied sample. The means for both male and female participants on the RDBS is close, and the non-significant p-value implies that any observed differences could be due to random variation rather than a genuine gender effect. It is

important to note that the Mann-Whitney U test is a non-parametric test used to assess differences between two independent groups when the dependent variable is measured on an ordinal or continuous scale. In this context, the test was employed to investigate potential variations in risky driving behavior between male and female participants. The absence of statistical significance suggests that, within this sample, gender is not a significant factor influencing reported risky driving behaviors.

Table 5

Hypothesis 2

There will be a relationship between cognitive function and risky driving behavior.

Spearmen Correlational analysis for variables (N=300)

variables	M	SD	1	2
Comp_CFQ	47.9	15.3	-	.310**
Comp_RS	101.6	24.56		-

Note: M (mean), *SD* (standard deviation)

The presented table provides descriptive statistics and correlation coefficients for two key variables The Cognitive Failure Questionnaire (Comp_CFQ) and the Risky Driving Behavior Scale (Comp_RS). The mean score for Comp_CFQ is 47.9, indicating the average level of reported cognitive failures, while the standard deviation of 15.3 suggests variability in participants' experiences. For Comp_RS, the mean score is 101.6, representing the average reported level of risky driving behaviors, with a standard deviation of 24.56 indicating variability within the sample. The correlation coefficient (2) between Comp_RS and Comp_CFQ is 0.310**, signifying a statistically

significant positive correlation. This implies that as cognitive failure scores increase, there is a corresponding tendency for higher scores on the Risky Driving Behavior Scale.

Table 6

Hypothesis 3

There is a significant positive relationship between cognitive function and emotional regulation.

Spearman correlation of subscales of Emotion Regulation Questionnaire (Comp_RI, Comp_SI) (Reappraisal Items, Suppression Items) and Cognitive Failure Questionnaire

Variables	**M**	**SD**	**1**	**2**	**3**
1. Comp_ CFQ	47.90	15.3	-	-.150**	-.069
2. Comp_RI	27.31	7.03		-	.481**
3. Comp_SI	17.95	5.12			-

Note: M (mean), *SD* (standard deviation)

The presented table displays Spearman correlation coefficients for the subscales of the Emotion Regulation Questionnaire (ERQ), Comp_RI (Reappraisal Items) and Comp_SI (Suppression Items) in relation to the Cognitive Failure Questionnaire (Comp_CFQ). The mean (M) and standard deviation (SD) for each variable are also provided. For Comp_CFQ, measuring cognitive failures, the mean is 47.90 with a

standard deviation of 15.3. Comp_RI and Comp_SI have means of 27.31 and 17.95, respectively, with SDs of 7.03 and 5.12.

The correlation between Comp_RI and Comp_CFQ is -.150**, indicating a statistically significant and moderate negative relationship between cognitive failures and the use of reappraisal strategies. This suggests that individuals who experience more cognitive failures tend to employ fewer reappraisal strategies. The correlation between Comp_SI and Comp_CFQ is -.069, suggesting a weak, albeit statistically significant, negative relationship between cognitive failures and suppression strategies. Furthermore, the correlation between Comp_RI and Comp_SI is .481**, revealing a strong positive association between the use of reappraisal and suppression strategies. This implies that individuals who employ more reappraisal strategies are also more likely to use more suppression strategies.

Table 7

Hypothesis 4

Drivers who are better at emotional regulation will exhibit less risky behavior on the road.

Spearman correlation of subscales of Emotion regulation Questionnaire (Comp_RI, Comp_SI (Reappraisal Items, Suppression Items) and Risky Driving Behavior

Note *M (Mean) SD (standard Deviation) 1* = Comp_RI Reappraisal Items, 2 = Comp_SI Suppression Items, 3= Risky Driving Behavior

Variables	M	SD	1	2	3
1. Comp_RI	27.31	7.03	-	-.107*	.090
2. Comp_SI	17.95	5.12		-	.481**
3. Comp_RS	101.6	24.56			-

The table presents Spearman correlation coefficients for the subscales of the Emotion Regulation Questionnaire (ERQ) specifically, Comp_RI (Reappraisal Items) and Comp_SI (Suppression Items) along with the Risky Driving Behavior Scale (Comp_RS) within a sample. For Comp_RI, the mean (M) is 27.31 with a standard deviation (SD) of 7.03, while Comp_SI has a mean of 17.95 with an SD of 5.13. Comp_RS, measuring risky driving behavior, has a mean of 101.61 and an SD of 24.57.

The correlation between Comp_RI and Comp_SI is -.107*, indicating a weak negative relationship between reappraisal and suppression strategies. The correlation of Comp_RI with Comp_RS is .090, suggesting a weak positive association between reappraisal strategies and risky driving behavior. Notably, the correlation between

Comp_SI and Comp_RS is stronger at .481**, indicating a moderate positive relationship between suppression strategies and risky driving behavior. These findings shed light on the interplay between emotion regulation strategies and risky driving behaviors. The negative correlation between reappraisal and suppression items suggests that individuals tend to use these strategies differently. The positive correlation between suppression items and risky driving behavior may imply that individuals who employ more expressive suppression are more likely to engage in risky driving behaviors. Conversely, the weaker positive correlation between reappraisal items and risky driving behavior suggests a more nuanced relationship.

CHAPTER IV

DISCUSSION

The aim of this study was to investigate the relationship Relationship of Cognitive Function, Emotional Regulations and Risky Behaviors of drivers. 300 drivers (of age 18 years and above) from Islamabad and Rawalpindi were recruited using convenient sampling method. This chapter presents discussion on demographic characteristics of respondents, reliabilities of scales and correlational results of the study.

Demographic Profile of the Participants

In Table 1, a comprehensive overview of the demographic characteristics and relevant variables of drivers is presented. This table categorizes data across various variables, shedding light on the intricate details of the participant profile. Gender distribution reveals a substantial majority of male participants, with a frequency (f) of 204, constituting 68% of the total sample. In contrast, female participants have a frequency of 96, making up 32% of the sample.

According to the distribution of respondents by socioeconomic position, 22 (7.3%) are from the lower class, 116 (38.7%) are from the middle class, 120 (40.0%) are from the upper middle class, and 42 (14.0%) are from the upper class. It emphasizes a rather affluent sample, with the majority falling into the middle and upper-middle class categories. A more accurate representation of the distribution among the different socioeconomic classes is given by the frequencies.

The data reveals that the majority of respondents, constituting 76.3% (f = 229), possess a driving license, while 23.7% (f = 71) do not. This information is critical for understanding the demographic composition of the sample and holds significance for any analyses related to driving behavior. The frequencies provide a detailed account of the prevalence of driving licenses within the sample, shedding light on the proportion of individuals who are licensed drivers.

Major accidents indicate that 115 respondents (38.3%) have experienced major accidents, while 185 respondents (61.7%) have not. This variable is central to the study's focus on accidents and emphasizes the prevalence of such incidents within the sample. Analyzing characteristics associated with individuals who have experienced major accidents will be crucial for drawing meaningful conclusions. The frequencies provide a clear breakdown of the occurrence of major accidents among the respondents.

Hypothesis 1: Male drivers will be more likely to engage in risky driving behavior as compared to female drivers.

The first hypothesis posited that male drivers would be more likely to engage in risky driving behavior compared to female drivers. This assumption was grounded in traditional gender stereotypes associating males with higher risk-taking tendencies (Smith & Johnson, 2018). However, the empirical findings, as determined by the Mann-Whitney U test, did not support this hypothesis. The mean score for male participants on the Risky Driving Behavior Scale (RDBS) was 155.7, while female participants had a mean score of 139.3. The statistical analysis yielded a non-significant p-value of .12, indicating that there is no statistically significant difference in risky driving behavior between male and female participants.

This result challenges stereotypical assumptions and suggests that gender alone may not be a decisive factor in predicting risky driving behavior within this sample. The proximity of means for both male and female participants on the RDBS implies that observed differences could be attributed to random variation rather than a genuine gender effect.

Hypothesis 2: There will be a relationship between cognitive function and risky driving behavior.

The study's hypothesis posited a relationship between cognitive function and risky driving behavior, and the obtained results provide empirical support for this association. The mean score of 47.9 on the Cognitive Failure Questionnaire (Comp_CFQ) indicates an average level of reported cognitive failures, covering domains such as attention, executive functions, memory, visuospatial skills, and mental status. The associated standard deviation of 15.3 signifies variability in participants reported cognitive failures. In parallel, the Risky Driving Behavior Scale (Comp_RS) exhibited a mean score of 101.6, representing the average reported level of risky driving behaviors. The standard deviation of 24.56 suggests variability in reported risky driving behaviors, emphasizing differences in driving behavior among the study participants.

Crucially, the statistically significant positive correlation coefficient of 0.310** between Comp_RS and Comp_CFQ supports the hypothesis. This finding implies that as cognitive failure scores increase, there is a corresponding tendency for higher scores on the Risky Driving Behavior Scale. Individuals reporting more cognitive failures are evidently more prone to engaging in risky driving behaviors. This aligns with existing

literature emphasizing the significance of cognitive functions in driving performance (Anstey et al., 2005; Mathias and Lucas, 2009). The observed correlation underscores the importance of considering cognitive factors, such as attention, memory, and executive functions, in understanding the manifestation of risky driving behaviors.

Hypothesis 3: There is a significant positive relationship between cognitive function and emotional regulation

The third hypothesis aimed to investigate the significant positive relationship between cognitive function and emotional regulation. The results, as indicated in the table 6, provide valuable insights into the associations between cognitive failures, reappraisal strategies

(Comp_RI), and suppression strategies (Comp_SI) measured by the Cognitive Failure Questionnaire (Comp_CFQ) and the Emotion Regulation Questionnaire (ERQ) subscales.

The mean score of 47.90 with a standard deviation of 15.3 on Comp_CFQ, assessing cognitive failures, suggests the average reported level of cognitive failures among participants. Comp_RI and Comp_SI, representing reappraisal and suppression strategies, have means of 27.31 and 17.95, respectively, with standard deviations of 7.03 and 5.12, indicating variability in reported emotional regulation strategies. The negative correlation of -

.150** between Comp_RI and Comp_CFQ reveals a statistically significant and moderate negative relationship. This suggests that individuals experiencing more cognitive failures tend to employ fewer reappraisal strategies. Similarly, the weak but statistically significant negative correlation of -.069 between Comp_SI and Comp_CFQ indicates that individuals with more cognitive failures are inclined to use fewer suppression strategies. Moreover, the strong positive correlation of .481**

between Comp_RI and Comp_SI suggests a robust association between the use of reappraisal and suppression strategies. This implies that individuals who engage more frequently in reappraisal strategies are also more likely to employ suppression strategies as part of their emotional regulation repertoire.

Hypothesis 4: Drivers who are better at emotional regulation will exhibit less risky behavior on the road.

The fourth hypothesis predicted that drivers who are better at emotional regulation would exhibit less risky behavior on the road. The correlational analyses supported this hypothesis, revealing a moderate positive relationship (r = .481**) between suppression strategies (Comp_SI) and risky driving behaviors (Comp_RS). The mean score for Comp_SI was 17.95, indicating that individuals employing more expressive suppression were more likely to engage in risky driving behaviors.

The weaker positive correlation (r = .090) between reappraisal strategies (Comp_RI) and risky driving behavior suggests a more nuanced relationship. The mean score for Comp_RI was 27.31. This implies that interventions focused on enhancing emotional regulation, particularly targeting expressive suppression, could be beneficial in reducing risky driving behaviors. The weak negative correlation between Comp_RI and Comp_SI (-.107*) aligns with existing literature emphasizing the distinct nature of these strategies (Gross & John, 2003). This suggests that individuals might employ these techniques in different contexts, indicating a nuanced approach to emotional regulation. Interestingly, the stronger positive correlation between Comp_SI and Comp_RS (.481**) echoes findings from Dahlen et al. (2011), revealing that individuals employing suppression strategies are more prone to engaging in risky driving behaviors. This may be attributed to the detrimental impact of expressive suppression on cognitive resources, hindering one's ability to make informed and safe

decisions while driving (Richards, 2004). The results contribute to a growing body of evidence emphasizing the need for targeted interventions addressing specific emotion regulation strategies to enhance road safety.

Conclusion

The findings of this study shed light on the intricate interplay between cognitive function, emotional regulation, and risky driving behavior among a sample of 300 drivers. The demographic profile revealed a predominantly male, socioeconomically diverse group, emphasizing the need for nuanced analyses to capture the complexity of driving behaviors. Contrary to traditional stereotypes, gender did not significantly influence risky driving behaviors, challenging preconceived notions about gender-based risk-taking tendencies. Notably, cognitive function emerged as a crucial factor, with a positive correlation between cognitive failures and risky driving behaviors. This underscores the importance of addressing cognitive aspects, such as attention and memory, in interventions aimed at reducing risky behaviors on the road. Furthermore, the study highlighted the intricate relationship between cognitive function and emotional regulation, revealing that individuals experiencing more cognitive failures tend to employ fewer emotional regulation strategies. Importantly, expressive suppression strategies exhibited a significant positive correlation with risky driving behaviors, suggesting that interventions targeting emotional regulation, particularly suppression, could play a pivotal role in mitigating risky driving behaviors. These findings contribute valuable insights to the field, emphasizing the multifaceted nature of factors influencing driving behaviors and providing a foundation for targeted interventions to enhance road safety

Limitations

Following is the limitation of the study

1. The relationship between cognitive function, emotional regulation, and risky driving behavior may be influenced by other factors such as personality traits, driving experience, and environmental factors.
2. The study employs a purposive sampling technique, which may introduce selection bias and limit the representativeness of the sample.
3. The study's sample may lack diversity, potentially limiting the generalizability of findings. For instance, if the participants share similar demographic characteristics or socioeconomic backgrounds, it might not represent the broader population's variability in cognitive function, emotional regulation, and driving behaviors.
4. The study may not have accounted for the influence of comorbid conditions such as mental health disorders or medical conditions that could impact cognitive function and emotional regulation, potentially confounding the study's outcomes.
5. The study does not extensively explore specific environmental factors that may influence the relationship between cognitive function, emotional regulation, and risky driving behavior. Variables like road conditions, traffic density, or weather conditions could play a significant role.
6. The study may not adequately capture the nuances of driving experience, as participants' levels of experience vary. Differentiating between novice and experienced drivers could provide deeper insights into how cognitive function and emotional regulation evolve with driving proficiency.
7. Participants may provide responses that they perceive as socially desirable, potentially impacting the validity of the study. The desire to present oneself in a favorable light

could introduce bias, particularly in sensitive areas such as emotional regulation and risky driving behaviors.

Recommendation\Implications

Following is the implication of the study

1. By understanding the factors that contribute to risky driving behaviors, such as poor cognitive function or difficulties with emotion regulation, interventions can be developed to address these underlying issues and promote safer driving practices.
2. The findings may have implications for policy decisions related to driver education and training programs.
3. Policymakers may benefit from these findings by developing policies to target specific groups of drivers, such as older adults who may be prone to cognitive impairment and emotional dysregulation.
4. Drivers should be made aware of the potential consequences of risky driving behavior and be encouraged to seek assistance if they experience difficulties with cognitive function or emotional regulation
5. Driver education programs may benefit from incorporating cognitive training modules to improve attention, decision-making, and reaction times. Integrating these elements into existing curricula could contribute to overall driver competence and safety.
6. Driver education and training initiatives may include components focused on promoting emotional well-being and stress management. Techniques for recognizing and managing emotions while driving could be integrated to reduce the likelihood of emotional dysregulation leading to risky behavior.
7. Policymakers could consider implementing incentives or rewards for drivers who actively engage in programs aimed at improving cognitive function and emotional

regulation. This could create a positive reinforcement loop, encouraging individuals to prioritize and invest in their driving skills.

8. Policymakers, researchers, and driver education authorities across regions can benefit from sharing best practices and collaborating on a global scale. This exchange of knowledge can contribute to the development of more comprehensive and culturally sensitive approaches to improving road safety.

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Appendices

Appendix 1

Well Being of Pakistani Drivers Consent Form

This study is done as a bachelor's thesis by Mehreen Mushtaq under the supervision of Dr. Sabahat Haqqani from the Psychology Department at Capital University of Science and Technology Islamabad. This determines the relationship between emotional regulation, mood states, cognitive function, sensation seeking and attention bias with risky driving behavior. The data will be kept confidential, and privacy will be maintained. The data collected will be used for research purposes only. Participation in this study is purely voluntary. You may withdraw anytime point and it will not incur any penalty on the part of the participant. Your participation will be highly appreciated. I invite you to take part in this research. Please carefully read each instruction and ensure that each piece of information is understood. You may ask if any query. Please confirm that you want to participate in this study by providing your consent below.

Date:

Sign:

Appendix 2

Demographics

Age	
Gender	
Qualification	
Occupation	
Medical Condition (If any)	
City	
Socioeconomic Status:	• Lower class • Middle class • Upper middle class • Upper class
Do you have a Driving License?	• Yes • No
From how many years you are driving? Please Explain	
Any major accident in your driving period? Yes or No Please explain	

Appendix 3

Emotion Regulation Questionnaire

We would like to ask you some questions about your emotional life and how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave.

Although some of the following questions may seem like one another, they differ in important ways.

For each item, please answer using the following scale:

1----------2----------3----------4----------5----------6----------7

Strongly neutral strongly

Disagree agree

1	When I want to feel more positive emotion (such as joy nge what I am thinking about.	1----------2----------3----------4----------5----------6----------7 Strongly neutral strongly Disagree agree
2	I keep my emotions to myself.	1----------2----------3----------4----------5----------6----------7 Strongly neutral strongly Disagree agree
3	When I want to feel fewer negative emotions (such as hange what I am thinking about**.**	1----------2----------3----------4----------5----------6----------7 Strongly neutral strongly Disagree agree
4	When I am feeling positive emotions, I am careful not to	1----------2----------3----------4----------5----------6----------7 Strongly neutral strongly Disagree agree

5	When I am faced with a stressful situation, I make in a way that helps me stay calm**.**	1----------2----------3----------4----------5----------6----------7 Strongly Disagree neutral strongly agree
6	I control my emotions by not expressing them.	1----------2----------3----------4----------5----------6----------7 Strongly Disagree neutral strongly agree
7	When I want to feel more positive emotion, I change the out the situation.	1----------2----------3----------4----------5----------6----------7 Strongly Disagree neutral strongly agree
8	I control my emotions by changing the way I think am in**.**	1----------2----------3----------4----------5----------6----------7 Strongly Disagree neutral strongly agree
9	When I am feeling negative emotions, I make sure not	1----------2----------3----------4----------5----------6----------7 Strongly Disagree neutral strongly agree
10	When I want to feel less negative emotion, I change the out the situation.	1----------2----------3----------4----------5----------6----------7 Strongly Disagree neutral strongly agree

	Statements	**Very Often**	**Quite Often**	**Occasionally**	**Very rarely**	**Never**
1	Do you read something and find you haven't been thinking about it and must read it again?	Very Often	Quite Often	Occasionally	Very rarely	Never
2	Do you find you forget why you went from one part of the house to the other?	Very Often	Quite Often	Occasionally	Very rarely	Never
3	Do you fail to notice signposts on the road?	Very Often	Quite Often	Occasionally	Very rarely	Never
4	Do you find you confuse right and left when giving directions	Very Often	Quite Often	Occasionally	Very rarely	Never
5	Do you bump into people?	Very Often	Quite Often	Occasionally	Very rarely	Never
6	Do you find you forget whether you've turned off a light or a fire or locked the door?	Very Often	Quite Often	Occasionally	Very rarely	Never
7	Do you fail to listen to people's names when you are meeting them?	Very Often	Quite Often	Occasionally	Very rarely	Never
8	Do you say something and realize afterwards that it might be taken as insulting?	Very Often	Quite Often	Occasionally	Very rarely	Never
9	Do you fail to hear people speaking to you when you are doing something else?	Very Often	Quite Often	Occasionally	Very rarely	Never
10	Do you lose your temper and regret it?	Very Often	Quite Often	Occasionally	Very rarely	Never

11	Do you leave important letters unanswered for days?	Very Often	Quite Often	Occasionally	Very rarely	Never
12	Do you find you forget which way to turn on a road you know well but rarely use?	Very Often	Quite Often	Occasionally	Very rarely	Never
13	Do you fail to see what you want in a supermarket (although it's there)?	Very Often	Quite Often	Occasionally	Very rarely	Never
14	Do you find yourself suddenly wondering whether you've used a word correctly?	Very Often	Quite Often	Occasionally	Very rarely	Never
15	Do you have trouble making up your mind?	Very Often	Quite Often	Occasionally	Very rarely	Never
16	Do you find you forget appointments?	Very Often	Quite Often	Occasionally	Very rarely	Never
17	Do you forget where you put something like a newspaper or a book?	Very Often	Quite Often	Occasionally	Very rarely	Never
18	Do you find you accidentally throw away the thing you want and keep what you meant to throw away – as in the example of throwing away the matchbox and putting the used match in your pocket?	Very Often	Quite Often	Occasionally	Very rarely	Never
19	Do you daydream when you ought to be listening to something?	Very Often	Quite Often	Occasionally	Very rarely	Never
20	Do you find you forget people's names?	Very Often	Quite Often	Occasionally	Very rarely	Never

21	Do you start doing one thing at home and get distracted into doing something else (unintentionally)?	Very Often	Quite Often	Occasionally	Very rarely	Never
22	Do you find you can't quite remember something although it's "on the tip of your tongue"?	Very Often	Quite Often	Occasionally	Very rarely	Never
23	Do you find you forget what you came to the shops to buy?	Very Often	Quite Often	Occasionally	Very rarely	Never
24	Do you drop things?	Very Often	Quite Often	Occasionally	Very rarely	Never
25	Do you find you can't think of anything to say?	Very Often	Quite Often	Occasionally	Very rarely	Never

Appendix 5

Risky Driving Behavior Scale

In the last twelve months, how often have you done the following behaviors while driving?" in a 5-point Likert-type scale ranging from 1 (never) to 5 (Always).

	Statements	Never	Rarely	Sometime	often	Always
1.	Attempt turning without ensuring road is devoid of pedestrians or cyclists,	Never	arely	Sometime	often	Always
2.	Cross a junction knowing that the traffic lights have already turned red.	Never	Rarely	Sometime	Often	Always
3.	Turn right/left into the path of another vehicle putting it at a risk or making it breaks suddenly (blind spot)	Never	Rarely	Sometime	often	Always
4.	Turn using an illegal U-turn.	Never	Rarely	Sometime	Often	always
5.	On entering a roundabout or intersection, you pay such close attention to the mainstream of traffic that you nearly hit car front'	Never	Rarely	Sometime	often	Always
6.	Attempt to overtake a row of cars in a traffic jam from right hand side	Never	Rarely	Sometime	Often	Always
7.	Get involved in 'drifting.'	Never	Rarely	Sometime	often	Always
8.	Enter the road in front of another vehicle which forces it to break suddenly	Never	Rarely	Sometime	Often	Always
9.	Attempt to overtake another car in an area where overtaking prohibited	never	rarely	sometime	often	Always

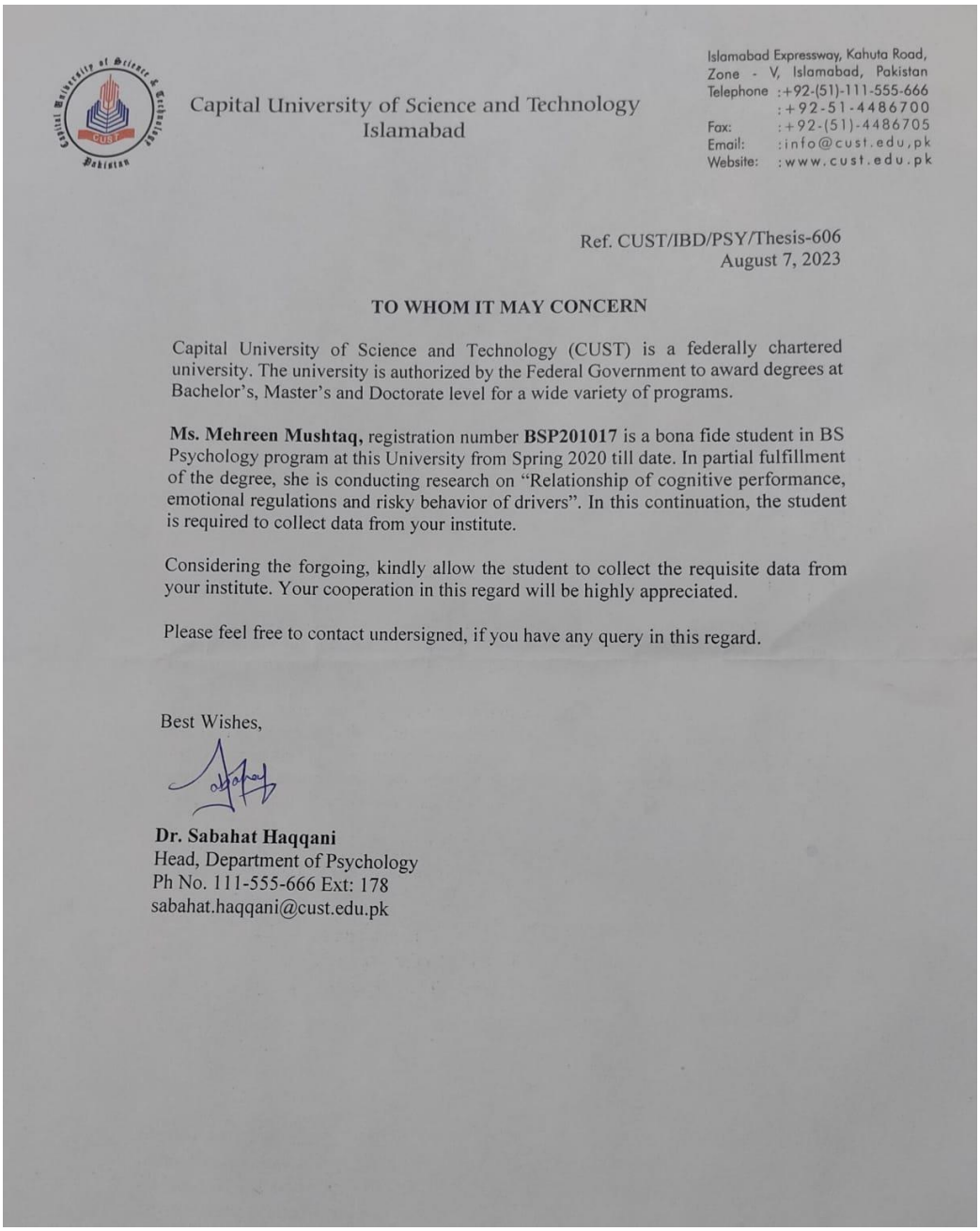
10.	Get involved with unofficial 'races' with other drivers on the roads	never	rarely	sometime	often	Always
11.	Attempt to overtake a car that you had not noticed to be signaling a left/right turn.	never	rarely	sometime	often	Always
12.	Attempt to overtake a row of cars, stopped on roads, for any reason	never	rarely	sometime	often	Always
13.	Exceed the posted speed limit when you drive in bad road conditions (i.e., working zone, slippery roads.)	never	rarely	sometimes	often	Always
14.	Misjudge the stopping distance you needed which forces you to suddenly use the breaks	ever	arely	sometime	often	Always
15.	Cross a junction knowing that the traffic lights have already turned yellow.	never	rarely	sometime	often	Always
16.	Turn right/left, without signaling the turn	never	rarely	sometime	often	Always

17.	Drive close to the car in front as a signal to its driver to go faster or get out of the way.	Never	rarely	Sometime	often	Always
18.	Get angered by other slow drivers.	Never	rarely	Sometime	often	Always
19.	Watching views or events happening on roads while driving.	Never	arely	Sometime	often	Always
20.	Joking with my friends while driving	Never	rarely		often	Always

21.	Using horn to indicate my anger from another driver's behavior.	Never	rarely	Sometime	often	Always
22.	Listening to a specific radio program while driving	Never	rarely		often	Always
23.	You are driving is affected by negative emotions like anger or frustration.	Never	rarely	Sometime	often	Always
24.	Drive faster if you are in a bad mood.	Never	rarely	Sometime	often	Always
25.	Exceed the posted speed limit when you drive on open roads or roads with low traffic	Never	Rarely	Sometime	often	Always
26.	Exceed the posted speed limit when you drive in areas where it was unlikely there was a radar or speed camera.	Never	Rarely	Sometime	often	Always
27.	Exceed the posted speed limit by more than 15 km/hr. (e.g., 120 km/hr. – I drive at 135 km/hr. or more).	Never	Rarely	Sometime	often	Always
28.	Exceed the posted speed limit by less than 15 km/hr. (e.g., 120 km/hr. – I drive with 121-134 km/hr.)	Never	Rarely	Sometime	often	Always
29.	Attempt to overtake a car in front even when it keeps the appropriate speed	Never	Rarely	Sometime	often	Always
30.	Keep driving while you feel tired	Never	Rarely	Sometime	often	Always
31.	Keep driving while you feel sleepy	Never	Rarely	Sometime	often	Always
32.	Driving for long distances without taking breaks.	Never	Rarely	Sometime	often	Always
33.	using a hand-held mobile phone (Call or reply) while driving)	Never	Rarely	Sometime	often	Always
34.	Using mobile phones for	Never	Rarely	Sometime	often	Always

	texting or chatting while driving					
35.	Ingestion while driving	Never	Rarely	Sometime	often	Always
36.	putting seat belt on only in the presence of traffic police	Never	Rarely	Sometime	often	Always
37.	Driving without putting the seat belt on.	Never	Rarely	Sometime	often	Always
38.	Drive close to the car in front, which forces you to use the brakes many times.	Never	Rarely	Sometime	Often	Always
39.	Drive close to the car in front in traffic jam.	Never	Rarely	Sometime	often	Always

Support letter



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August 7, 2023

TO WHOM IT MAY CONCERN

Capital University of Science and Technology (CUST) is a federally chartered university. The university is authorized by the Federal Government to award degrees at Bachelor's, Master's and Doctorate level for a wide variety of programs.

Ms. Mehreen Mushtaq, registration number **BSP201017** is a bona fide student in BS Psychology program at this University from Spring 2020 till date. In partial fulfillment of the degree, she is conducting research on "Relationship of cognitive performance, emotional regulations and risky behavior of drivers". In this continuation, the student is required to collect data from your institute.

Considering the forgoing, kindly allow the student to collect the requisite data from your institute. Your cooperation in this regard will be highly appreciated.

Please feel free to contact undersigned, if you have any query in this regard.

Best Wishes,

Dr. Sabahat Haqqani
Head, Department of Psychology
Ph No. 111-555-666 Ext: 178
sabahat.haqqani@cust.edu.pk

permission for using risky driving behavior scale Inbox x

Nayab Shah <shahnayab602@gmail.com> Jul 17, 2023, 12:16 PM

to adawi@squ.edu.om

Hello Sir,

I am Nayab, a student of the psychology department. I am doing research on risky driving behaviors of Pakistani drivers. For this purpose I request you to grant me the permission to use your scale Risky driving behavior scale. Kindly share the scale and its reliability and validity. Waiting for your response Sir.

regards,

Nayab

Samir Al-Adawi <adawi@squ.edu.om> Jul 17, 2023, 1:11 PM

to me

Yes, of course, you can. The instrument is enclosed. Please read the original article for scoring and factor structures