THE MEDIATING ROLE OF DRIVING-RELATED COGNITIONS AND ANXIETY IN THE RELATIONSHIP BETWEEN DRIVING SKILLS AND DRIVING BEHAVIORS

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ABSTRACT

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Driving skills and driving behaviors, as being the human factors in driving, are the most studied and most influential variables of efforts to sustain a safe traffic environment. Although these factors were investigated in the literature and their relationships with different variables and each other are examined in various studies with various samples; anxiety-related factors have always been evaluated only within limited (avoidant) or clinical groups. However, anxiety, like anger, is a negative emotional state that is frequently experienced during the day, and it is in effect while directing our actions. Based on this purpose and literature findings, this study examined the relationship between driving skills and driving behaviors (aberrant and anxious) in which the mediator roles of anxious driving cognitions, and anxiety level of drivers were investigated for the first time in the literature. As a result, it has been revealed that accident-panic related and social concerns, primarily related to traffic environments, were found as mediating variables in the path to anxiety performance deficits, lapses, and errors for both perceptual-motor skills and safety skills. Concerning the mediation analyses for state and trait anxiety, the results showed the mediation effect of trait anxiety in the path to

anxiety performance deficits, lapses, and errors for both perceptual-motor skills and safety skills. These results may reveal how errors and lapses made during driving are shaped by the individual's own skills evaluations and the interaction of these evaluations with anxiety-related cognition and anxiety levels. And these findings reinforce new information to better understand and control aberrant driving behaviors. This study could be a pioneering study in which individual literature findings related to driving skills, driving behaviors, driving, and general anxiety to date have been gathered, tested, and proven to be functional for the general driver population. In particular, the fact that the evaluations of individuals about their skills predict unintentional actions parallel to each other, such as anxious concerns or trait anxiety, and anxiety-performance deficits, errors, and lapses, highlights that there is a significant mechanism here.

Keywords: Driver Skills, Driver Behaviors, Driving Related Cognitions, Anxious Driving, Trait Anxiety

ÖZ

SÜRÜCÜLÜK BECERİLERİ VE SÜRÜCÜ DAVRANIŞLARI ARASINDAKİ İLİŞKİDE SÜRÜŞ İLE İLGİLİ BİLİŞSEL YARGILARIN VE KAYGININ ARACI ROLÜ

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Sürücü becerileri ve sürücü davranışları, yol trafik güvenliği alanyazınında en çok çalışılan ve en etkili değişkenleridir. Sürücü becerileri ve sürücü davranışları literatürde sıklıkla araştırılıp aralarındaki ilişkiler incelense de kaygıyla ilişkili faktörler her zaman sınırlı (kaçınan) veya klinik gruplar içinde değerlendirilmiştir. Ancak kaygı da öfke gibi gün içinde sıklıkla yaşanan olumsuz bir duygu durumudur ve eylemlerimizi yönlendirirken etkilidir. Bu amaç ve literatür bulgularından hareketle bu çalışmada, sürücü becerileri ile sürücü davranışları (sapkın ve kaygılı) arasındaki ilişki incelenmiştir. Ayrıca bu ilişki, kaygılı araç kullanma bilişleri ve kaygılarının aracı rolü ve sürücünün kaygı düzeyi ile de araştırılmıştır. Her bir değişken için ayrı ayrı yapılan detaylı araştırma ve testler sonucunda, algısal-motor becerilerin ve güvenlik becerilerinin kaygıya bağlı performans eksiklikleri ve hatalara giden yolda, trafik ortamlarıyla ilgili olmak üzere kaza-panik ile ilgili yargıların ve sosyal yargıların aracı değişkenleri ile anlamlı bir şekilde yordandığı bulunmuştur. Aynı incelemeler, durumluk ve sürekli kaygı için de test edilmiş ve hem algısal-motor beceriler hem de güvenlik becerileri için kaygıya bağlı performans eksiklikleri ve hatalara giden yolda

sürekli kaygının aracı rolü bulunmuştur. Bu çalışma, bugüne kadar sürücü becerileri, sürücü davranışları, sürüş ve genel kaygı ile ilgili bireysel literatür bulgularının toplandığı, test edildiği ve genel sürücü popülasyonu için işlevsel olduğu kanıtlayan öncü bir çalışmadır. Özellikle bireylerin becerilerine ilişkin değerlendirmelerinin, kasıtsız ve birbirine paralel olan eylemleri (performans eksiklikleri ve hatalar) yordarken kaygı ile alakalı değişkenlerin etkisinin saptanması, burada önemli bir mekanizmanın olduğunu vurgulamaktadır. Gelecekteki çalışmalarda, trafik ortamındaki günlük kaygının sonuçlarını daha iyi anlamak için, daha güvenli sürücüleri ve daha güvenli trafik ortamını desteklemek için bu potansiyel ilişkiler yeniden incelenmelidir.

Anahtar Kelimeler: Sürücü Becerileri, Sürücü Davranışları, Bilişsel Yargılar, Kaygılı Araç Kullanımı, Sürekli Kaygı

To Ege and Recep

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CHAPTER 1

INTRODUCTION

"A Car/ An Automobile: A road vehicle powered by a motor (usually an internal combustion engine), designed to carry a driver and a small number of passengers, and usually having two front and two rear wheels, esp. for private, commercial, or leisure use" (Oxford English Dictionary, 2022). With the introduction of this definition into our lives, the scope of physical mobility has completely changed. The car has become a representation of not only transportation and mobility but also freedom and autonomy for many individuals in different parts of the world. In just 15 years between 1980 to 1995, the global fleet of motor vehicles including cars, trucks, and, buses increased by 60% on the world's roads (Ingram & Liu, 1999). This motorization has improved the lives of many people and communities, on the other hand, it comes with a price and soon car accidents have become one of the most the world's biggest killers. While driving has been at the center of our lives, it also has caused us to lose many lives. (Gopalakrishnan, 2012; Lee, 2008).

Road traffic injuries were reported as one of the major public health problems in the reports of the World Health Organization 45 years ago, and despite widespread measures that have been used to control this disaster, the numbers and costs are still stated in the same way. Each year, approximately 1.3 million people lose their lives, and 20 to 50 million people suffer from injuries that cause disability or non-fatal injuries due to road traffic accidents. In addition to that, road traffic injuries are still one of the leading causes of morbidity, disability, and mortality in the world. Many traffic safety programs and countermeasures have been implemented over 45 years by many countries and organizations to minimize the costs, but

unfortunately, road traffic injuries, which cause death of especially children and young people between the ages of 5 and 29, cause incurable wounds both economically and spiritually for nations and families. (Lee, 2008; World Health Organization [WHO], 2022).

During Covid-19 Pandemic, there has been a significant decrease in traffic accident data worldwide, especially since the first months of 2020. On the other hand, reductions in the number of deaths due to road traffic accidents were observed before the Covid-19 pandemic and developed countries have succeeded in taking an important step to some extent. Even though the statistics show a slight decrease, road traffic accidents still continue to pose a great risk as a hidden epidemic, especially in low and middle-income countries. Statistics showed that 93% of deaths occur in low and middle-income countries, while these countries have about 60% of the world's vehicles. Moreover, even in developed countries, for lower socio-economic territories, road traffic safety is still challenging. (Hazen & Ehiri, 2006; International Traffic Safety Data and Analysis Group [IRTAD], 2020; WHO, 2022).

Despite the overall positive trend, in recent years, the rate of reduction in road traffic injuries and fatalities in most countries has diminished. Although roads are reported to be safer after COVID 19 lockdown lifestyle, several factors have been still needing urgent action. For example, inequality of distribution between countries, slowing down trends, child, young, and vulnerable road users' loss, and how traffic has been shaped after the introduction of new technologies into our lives are important puzzle pieces for traffic safety researchers. Road traffic accidents and injuries are catastrophic, on the other hand, the fact that preventable nature of them clearly motivates the scientists and practitioners in this field to understand the whole nature and determinants of road traffic safety. At this point, the focus comes to how traffic safety is studied and what it really means.

1.1. Factors Related to Traffic Safety

In traffic safety, instead of considering separately many different possible causes that are in interaction with each other, three main umbrella categories have been used since the 1970s. While bringing together the basic elements under 3 main categories related to traffic safety, Haddon has also revealed that these basic elements can be a crucial step for controlling losses that may occur before, during, and after the accident in a systematic way (1972; 1999). Although there have been new additions over the years, these main categories have had the same name and content for years, even in the same order of importance and they have been still widely used in the field.

From then to now, traffic safety specialists with these three main factors that are: Human Factors (generally driver), environment-related factors (generally road environment), and vehicle-related factors that could be responsible for road traffic accidents (Evans, 1991; Forbes, 1972; Grime, 1987). Environmental-related factors specifically include the elements related to physical, social, and cultural environments. Weather conditions, travel day, time, road conditions, road design, layouts, traffic density, traffic flow, signalization, and even the social and cultural components that interact with the travel are categorized under environmental related factors. Similar to environmental-related factors, vehicle-related factors also include various characteristics such as the segment of the vehicle, type of the vehicle, braking system, vehicle lighting, accident avoidance equipment, and technologies. The last and maybe the most complex factor is human factors that include all road users' characteristics such as age, gender, education, physical characteristics, experience, abilities and capabilities, cognition, attention, perception personality factors, drug usage, motivation, or distracting factors. Detailed examples could be seen in Figure 1 (Öz & Demirutku, 2018).

The importance of the road environment for a safe trip, the direct role of the vehicle in any accidents, the unpredictable nature of human beings or the interactions between them, or disruptions that may occur in any of these factors

could cause the accident. Which is unlikely to happen, could occur suddenly. Although each factor produces different unique accident scenarios with a single cause or with the interaction of human-vehicle and environment, systematic studies have also been conducted to understand the nature of these factors related to accident causation to take an urgent step for traffic safety (Uzondu, 2020).

Road safety research in which road, environment, human and total system components are studied, feed with observations and experiments by testing real lives. When the necessity of going beyond traditional knowledge in technical problems has not been enough to handle the accidents trend, different study groups started to investigate more influential factors to address this non-static problem (Traffic and Safety Division of the Road Research Laboratory, 1965; WHO, 2006). The two main prior studies on this topic were performed at Indiana University (The United States) and Transport and Road Research Laboratory (Great Britain) in the 1970s. Although the interaction between the factors was emphasized in these two comprehensive studies, where all the details are examined independently from each other, the effect of the human factor was overwhelming. The results were also so clear. After the examinations, the US study found the order as the dominance of human factor 93%, followed by road and environment factor: 34% and lastly vehicle factor 12% (Treat et al., 1979).

In GB study results also revealed the same order as the dominance of human factor 94%, followed by road and environment factor 28%, and lastly vehicle factor 8%. It is not a coincidence that the numbers are so similar to each other. Moreover, after these studies, a smaller-scale study was conducted in China, and the dominance of human factors in road safety area was reported as higher than 90% (Evans, 2004; Grime, 1987; Shinar, 2007). Although the traffic accidents statistic trends have changed for different regions for different reasons in the last 50 years, there has not been much change concerning the statistics and the dominance of the causative factors. While leading research institutions are still talking about the importance of the human factor and its effect on road traffic safety, many individual and institutional studies continue to be conducted on how human-

related factors could be controlled and intervened (WHO,2022; IRTAD, 2020; TUIK, 2022).

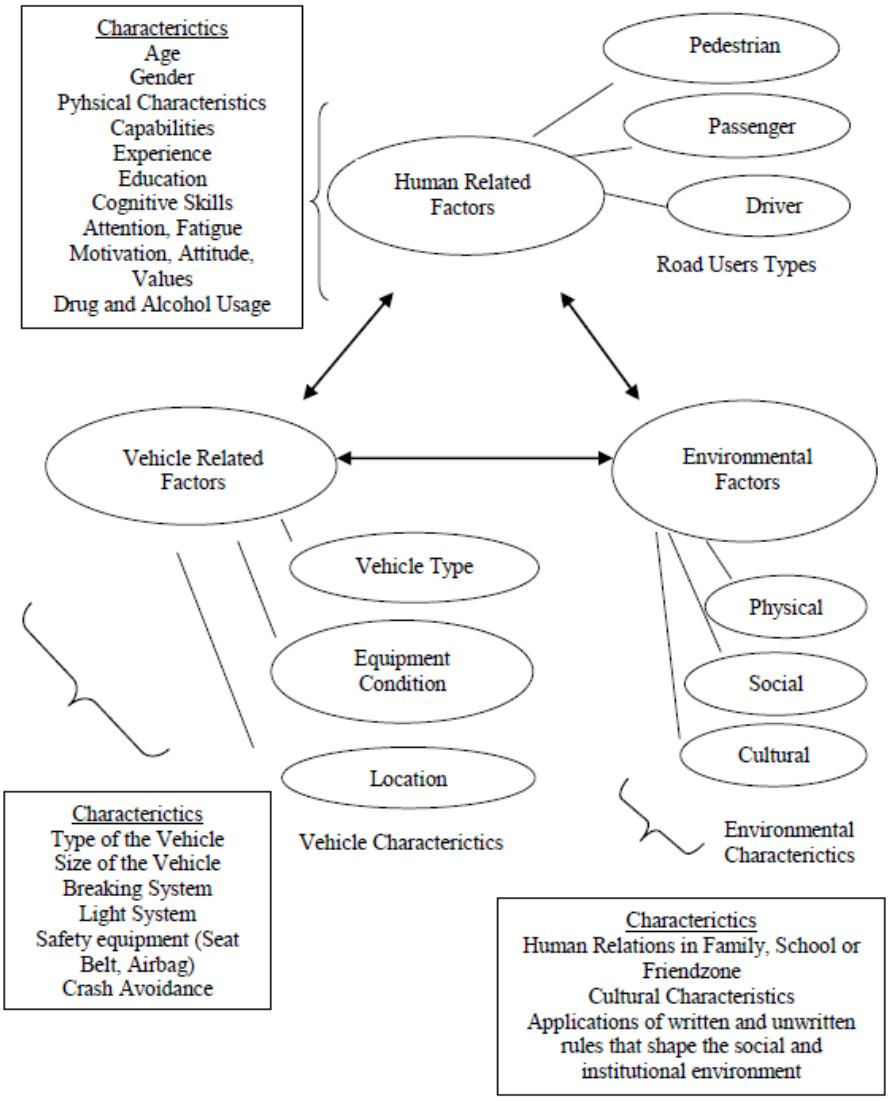

Figure 1. Main Causative Factors in Traffic Safety, Adapted from Öz & Demirutku, 2018.

1.2. Human Factors and Traffic Safety

Due to its impact, importance, and dominant role, human factors have been the most popular areas in traffic safety studies when considering the possible benefits of the interventions that focus on them. Similar to the studies being conducted in

any area directly related to human being, studying human factors in traffic safety research is also complex. On the other hand, literature showed that some sub-factors have attracted the researchers' attention.

Firstly, it could be said that the human factor in traffic studies generally deals with the issues around road users and their characteristics and actions. Moreover, when compared with other road users and factors, drivers constitute a completely different field of study when their effects on collisions are taken into account (Evans, 1991; Grime, 1987). Although, as we have mentioned before, a human is kneaded with a lot of sociocultural and technical issues due to his nature and the dynamism of the traffic environment s/he is in, the fact that a person comes to the traffic as a driver and the consequences of these are negative, actually depends on a basic algorithm (Özkan, 2006).

There are two requirements for a driver to be able to exist safely within the traffic system as he or she will set off and start driving. Firstly, "does s/he have the perceptual-motor and cognitive skills required" and the second is "does s/he use these automated skills in a safe and acceptable way?". Here, the human factor in traffic studies, in particular, driver-related studies have shaped, and it was revealed that the deficiencies in these two items were directly related to accidents. For this reason, for example, variables related to vision, visual attention, visual search, information processing, attention, perception, response time, comprehension experience, speed, aggressive driving, use of protective equipment, alcohol usage, prohibited substance usage, or tiredness which are directly related with human behaviors and actions have gained more importance for safe traffic systems (Evans, 1991; Fuller, 2005; Pêcher, Lemercier, & Cellier, 2011; Shinar, 2007).

Concerning the lights of the research that have been focused on human factors and specifically drivers, the main components of human factors are mainly studied under two main driving behaviors or driver acts: driving skill/performance "what the driver can do" and driving behavior/style "what the driver usually do". In other words, as mentioned before driving skills: does s/he have the perceptual-motor

and cognitive skills required and the driving behaviors: Does s/he use these automated skills in a safe and acceptable way? (Elander, West, & French, 1993; Evans, 1991, Özkan 2006).

1.2.1. Driving Skills / Driver Performance

Driving is a self-paced and complex task that also includes a closed-loop compensatory feedback control process. That is in order to handle a vehicle, a driver should make control inputs. for example, s/he should steer the wheel, control brakes, and accelerator pedal, then receive feedback by monitoring the consequences of these actions and then make additional actions and inputs. This process consists of lots of detailed feedback systems and adds a much more complex simultaneous control mechanism after starting to accelerate. After acceleration, the driver needs great attention for recognition, and other high-level cognitive skills to estimate future situations for responding to the upcoming future scenarios. Fortunately, these complex processes do not use resources as in the first time, as they become automated after a while (Evans, 2004).

All of the above-described operations are performed under driving skill/performance. Driving skills are the first step of being a driver and they emphasize a maximum level of performance and maximum ability. It generally includes the driver's actual knowledge, skills, and perceptual and cognitive abilities that are required to safely handle a vehicle. It is expected to improve with experience, practice, and training and it mainly concerns the performance of different driving tasks and needs great cognitive and psychomotor skills (Elander, West, & French, 1993). As it is mentioned above, the main examples could be using of steering wheel, tracking the road, detecting the hazard on roads, and responding to these hazards, however, it is a lot much more than that (Özkan, Lajunen, & Summala, 2006).

Learning skills is a significant part of driving is possible for anyone, and nearly everyone can do it. In other words, the person can start and stop the vehicle within

weeks and provide mobility in some way. Being a successful driver with various necessary skills based on distinct levels of hierarchy. This hierarchy is from bottom to top and includes control, maneuvering, and planning (Michon, 1985; Summala, 1996). The first stage of getting the necessary skills and control in this task is the cognitive process phase. The person tries to understand and perceive the components of driving task. The second stage is the part where s/he focuses on the feedback mechanism. Full attention was focused on the driving task and according to the feedback from the environment, the task could be controlled and navigated. Finally, the last stage is the automatic stage. At this stage, the effort becomes minimal and the person can simultaneously start navigating, conversing, looking around, talking on the phone, listening to the radio, or just thinking about other life-related things. Driving, which needs very little mental capacity, continues with direct attention only at the necessary times. In this part, self-awareness is critical for successful planning (Grime, 1987; Evans, 1999; Shinar, 2007).

While most drivers successfully complete this hierarchy of work every day properly, things actually could get messy here at some point. If attention is not given to driving in a life-threatening danger or if a driver makes the driving task too difficult for himself or herself that exceeds capabilities, the result will be a serious accident (Lajunen & Özkan, 2011, Lajunen, Corry, Summala, & Hartley, 1998).

1.2.2. Determinants of Driving Skills

Most of the earlier studies have stated that driving skills have been positively associated with the number of traffic injuries and accidents, therefore in-depth research has been done to understand the nature of driving skills to solve human factor problems (Lajunen et al., 1998).

The first remarkable research and distinction related to driving skills were done by Spolander (1983). The distinction was made between technical driving skills

and defensive driving skills. According to these categories, technical driving skills were generally about quick and fluent car control and traffic situation management. The other category is defensive driving skills which include anticipatory accident avoidance risks (Spolander, 1983).

On the other hand, in following studies stressed the importance rather than car control skills and feedback mechanism processes, pointed to adjusting driving task demands concerning own capabilities and skills. With this idea, Lajunen and Summala by extending the content of driving skills provide two distinct types of driving skills they are perceptual-motor skills and safety skills (Özkan & Lajunen, 2011).

1.2.2.1. Perceptual-Motor Skills

Similar to other causative accident factors, scientists have always addressed how to measure driving skills of road users. At this point, taking advantage of previous studies on this subject, perceptual-motor skills were named as one of the main determinants of driving skills by Lajunen and Summala (1995). Perceptual-motor skills consist of general technical and car handling skills and are extremely important especially while learning to drive. These skills are crucial for handling a car and are measured by the potential actions of drivers in particular traffic situations (Bener, Lajunen, Özkan, & Haigney, 2006; Martinussen, Moller, & Prato, 2014).

These skills could be investigated under two main parts that are motor skills and perceptual skills. Relevant studies showed that both skills could not be evolved in the same time period and while motor skills could be learned and improved during a short period of time, perceptual skills need much more time and patience. This is because of the necessities of these skills, while motor capabilities are based on physical capabilities, perceptual skills are depending on higher-order cognitive skills that are much more complex. Therefore, it could be said that while motor skills could be learned and automated during the first weeks of drive, much more

experience is needed to improve perceptual skills that are about complex cognitive skills. Moreover, sometimes individual characteristics intervene with cognitive capabilities, and more practice and training could be needed for a safe drive (Xu, Liu, Sun, Zhang, Qu, and Ge, 2018).

1.2.2.2. Safety Skills

Safety skills are the skills that are related to anticipatory accident avoidance risks that are drivers' skills to make driving task not exceed his/her capabilities. A driver with high safety skills means that driver is safe, rule obedient, and risk avoidant (Özkan & Lajunen, 2011).

Studies showed that compared to perceptual-motor skills, safety skills were found more related to accident causations. In addition, the distinction is imperative because the internal balance between the usage and the control of perceptual motor skills and own attitude toward safe applications could be one of the main determinants of human factors of accident occurrence. These mean safety skills are associated with how they use proper skills and abilities to safely operate the car. Moreover, studies prove the asymmetric relation between safety skills and perceptual skills. This asymmetric relation revealed that one who has low safety skills, generally reports high perceptual-motor skills that turn to the highest levels of accidents and penalties. These results pointed out the importance of the awareness and views of own driving skills and this asymmetric relation was proved by cross-cultural studies which strength the importance of the association (Özkan & Lajunen 2006, Özkan, Lajunen, Chliaoutakis, Parker, & Summala 2006; Sümer, Özkan, Lajunen, 2006).

As mentioned before both these determinants perceptual-motor skills and safety skills strongly associated with road traffic accidents and injuries. Moreover, these two determinants were discussed to measure general driving skills. As it is discussed in detail, in method section, these determinants were developed to measure by Driver Skill Inventory (DSI) which is a self-report instrument

developed by Lajunen and Summala (1995). These instruments were valid instruments in which items and factor structures were tested and validated for different driver groups and in different cultures with various studies. Therefore, in the light of the literature, the driving skills were examined and measured within the framework of the research made and used within the framework of the DSI. For more detailed statistical information about the instrument, please read the method section.

1.2.3. Driving Behaviors / Driver Style

The driver's driving performance is related to road traffic accident numbers on the other hand most road traffic accidents result in driver malfunctioning rather than technical driving problems. Therefore, road traffic accidents could usually be directly attributed to the behaviors of road users and specifically driving behaviors (Lajunen, Parker, & Summala, 2004).

Driving behaviors and in other words driving style concern driving habits of drivers and concern what the driver usually does. Unlike driver performance, a period of time is necessary for this style to be established. For driving behaviors, unfortunately, years and experience do not imply safety, and driving behaviors could be getting risky with this style acquisition. To be explained in more detail, as time passes, people develop a driving style by learning their abilities and capabilities, how much margin of error they can manage, and their limits, and this of course is directly affected by the person's personality, motivation or attitudes (Evans, 1999; Naatanen & Summala, 1976; Summala, 1980; Özkan & Lajunen 2011).

1.2.4. Determinants of Driving Behaviors

With driving behaviors being so important for road traffic safety, the first stage of answering the questions of how we can develop an intervention was to try to understand the mechanism underlying these driving behaviors. For this reason,

driving behavioral studies have gained priority for traffic safety and are among the problems that need to be solved first. The most prominent and outstanding work in the studies conducted in this context was the work of Reason et al. (1990) (Smorti & Guarnieri, 2016). The comprehensive point of view, which is the turning point for everyday driving behaviors for some researchers, has also been very popular and widely accepted in the field (Ranney, 1994).

In Reason's Human Error Theory, the main focus is measuring aberrant driving behaviors that are intended to find prediction of individual differences in road traffic accidents (Wahlberg, Dorn, & Kline, 2011). Furthermore, in this human error framework, two different classes of aberration were discussed to determine individual differences in the causation of road traffic accidents. This categorization mainly concerns errors and violations (Smorti & Guarnieri, 2016). These two concepts rely on different psychological origins, and different modes of remediation, and they could be separated from each other in terms of intention behind the action (Reason, Manstead, Stradling, Baxter, & Campbell, 1990). The human error algorithm that is the main conceptual framework of this study could be seen in Figure 2. In this figure, mainly following the intention of the driver, one could see the aberrant driving behaviors.

1.2.4.1. Errors, Lapses, Mistakes

The definition of error is "the failure of planned actions to achieve their intended consequences" (Reason et al., 1990, p. 1315) and it covers cognitive processing problems. This type of aberrant behaviors could be minimized and controlled by achieving better information.

After the main categorization as errors and violations, studies revealed that that could be different types of errors as well. Some errors could be the result of involuntary deviations from original intentions that are slips and lapses. Or some planned actions could not be ended successfully and desired goal of actions could deviate that are mistakes. Mistakes are generally about poor decision outcomes

and rely on failures in information processing. In addition to them, in this distinction, slips, and lapses cover memory failures and attention deficits that could cause embarrassment rather than affect driving safety dangerously. Moreover, this type of error has little risk to other road users like forgetting where you parked your car (Iliescu & Sarbescu, 2013; Wahlberg, Dorn, & Kline, 2011).

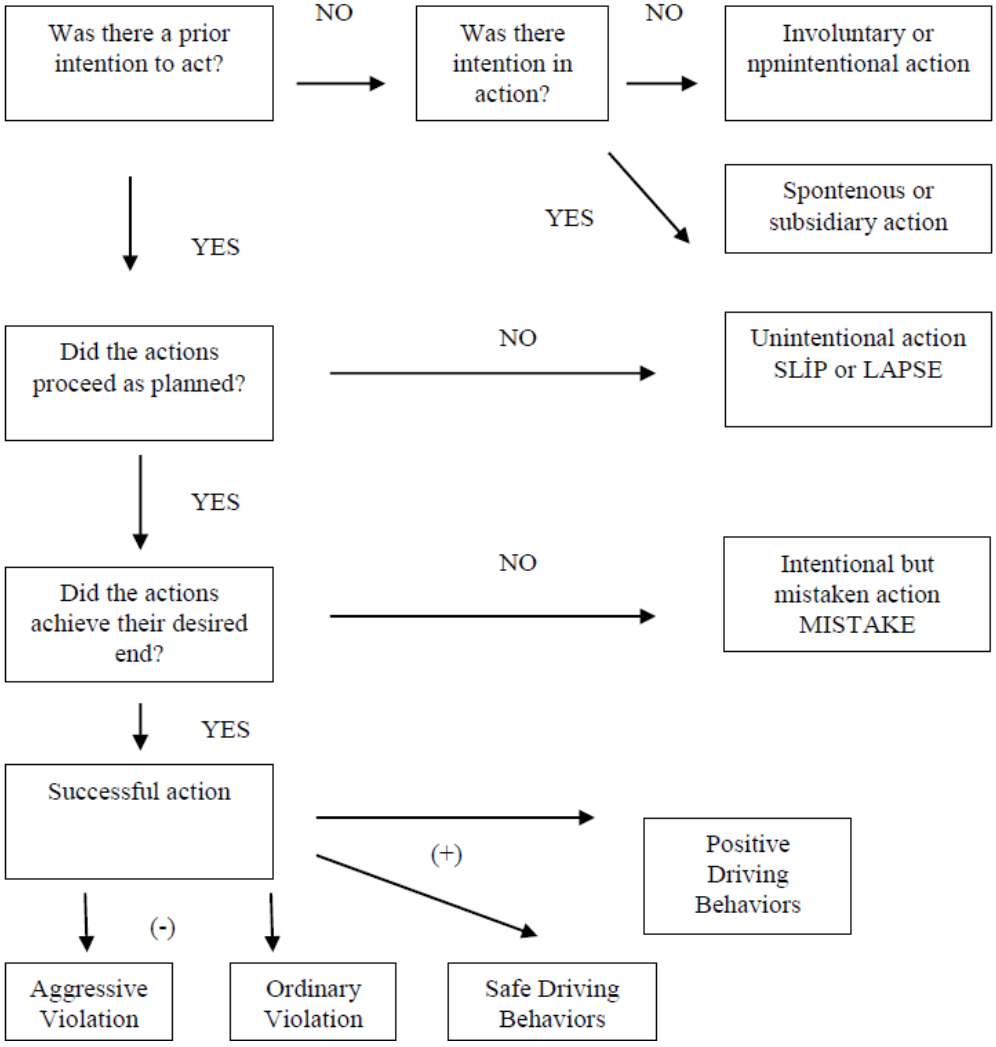

Figure 2. The Adapted Human Error Algorithm (Reason, 1990).

1.2.4.2. Violations

Unlike errors, If the person commits violations, there is no simple recipe as in errors. In order to control violations, first of all, it is necessary to change the beliefs, norms, and attitudes of the person underlying that behavior. Which is not an easy task as it is written.

The definition of violation is “deliberate deviations from those practices believed necessary to maintain the safe operation of a potentially hazardous system” (Reason et al., 1990, p. 1316) and it covers motivational component and contextual demand. Violations could be seen as deliberate behaviors (Lajunen & Özkan, 2011).

After the main findings related to violations, new studies were conducted, and by adding new concepts, Lawton and colleagues also distinguished violations into two categories as aggressive and ordinary violations. According to these classifications, ordinary violations were defined as “deliberate breaking of the highway code and/or the law without aggressive motivation or aim (i.e., speeding)” and aggressive violations were defined as “actions that involved overtly aggressive acts (i.e., showing hostility)” (Lawton, Parker, Manstead, & Stradling, 1997).

The Driver Behavior Questionnaire, which is created from the theoretical decompositions mentioned above, is an instrument that has been applied in many studies, factor and item structure in different countries and cultures, and its validity and reliability have been tested. The subheadings and statistical structure of this measurement tool were examined in more detail in the method section (Winter & Dodou, 2010).

1.3. Relationship between Driving Skills and Driving Behavior

In addition to them, as explained in the previous sections, although driver's skills alone do not directly cause an accident every time, people's beliefs alone may not be sufficient for collisions to occur. Road accident is a bit more complicated because people have the chance to make driving risky or safe due to the complex and self-paced nature of driving (Özkan & Lajunen 2006). If one answers as a high ability to comply with traffic rules, anyone does not expect violations related to traffic lights in behavioral measurements (Martinussen, Mollar, & Prato, 2014)

Therefore, expecting the interaction between driving skills and driving behaviors is not surprising. With this idea, several researchers in the field investigate particularly, driving skills and driving behaviors relations to understand driver unsafe actions. In practice, it could be said that driving performance and style can interact together to influence accident risk. Especially in the studies that use the same theoretical frame mentioned in this study. The results are continuation of each other and contribute to the literature with compatible results as it was expected. For example, in the study of Martinussen et al., one of the recent studies, perceptual-motor skills, and violations have a positive relationship, while safety skills have a positive relationship with violations, errors, and lapses (2014). In addition, as people drive and make enough practice, their abilities and skills in various situations will undoubtedly increase, but at the same time, people's subjective control of driving will increase and they will be able to narrow the limits of safety even more. With this logic, while the perceptual-motor abilities of people increase, their safety abilities may decrease (Lajunen & Özkan 2011). In the studies conducted based on this logic, it has been mentioned that the safety skills may be lower, especially when the perceptual-motor abilities of the people are high, and this may result in very risky results such as risky violations (Özkan et al., 2006; Sümer et al., 2006; Martinussen et al., 2014).

It is clear that there is a relationship between driving skills and driving behaviors in the studies carried out, but depending on the scope of the measurement, the type of this relationship, the affecting side factors, and indeed the general mechanism may be differentiated. Although there are various measurement tools for both driving skills and driving behaviors, self-report tools have been used as measurement tools in the studies that constitute the theoretical background of this study. Especially DSI and DBQ are very respected, valuable, and valid measurement tools in the field. Although various studies have proven that this instrument measures actual, especially for driving behaviors, the situation could not the same for driving skills. To be more clear, styles of people settle over time and people are aware of this situation because they are reflections of various personality traits (Özkan & Lajunen 2006; Xu, Liu, Sun, Zhang, Qu & Ge, 2018).

Therefore, people can reliably talk about their choices and styles, and that's credible. For this reason, it can be said that this measurement tool could directly measure driving behaviors and style in a valid way. However, the situation is slightly different, especially in DSI. In DSI, people's own evaluations and thoughts about their driver's skills and safety orientation are measured instead of direct skills measurement. In other words, this measurement tool reflects drivers' views and ideas about their strengths and weaknesses while driving. And in fact, this measurement may be more important when creating their styles because it reflects drivers' own estimation about his/her performance.

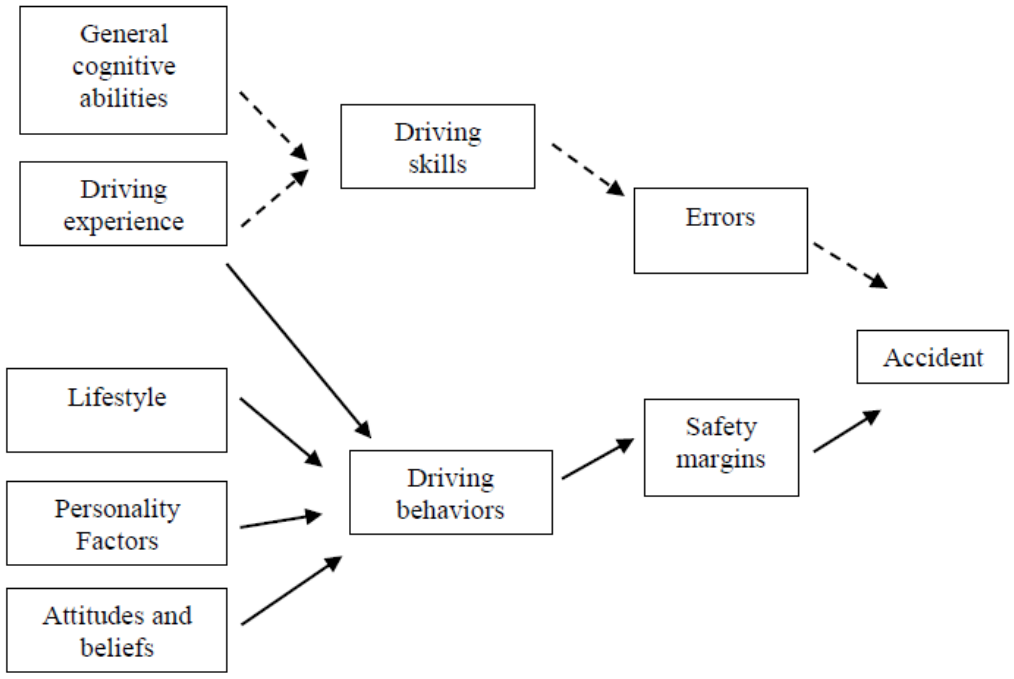

Figure 3. Pathways of Driving Skills and Driving Behaviors to Accident (Taken from Lajunen & Özkan, 2011).

From another point of view, both driving skills and driving behaviors can lead to accident by increasing the possibility of errors and decreasing safety margins. The general logic and the path to accident through error and safety margin could be seen in Figure 3. In the diagram of general capacity and experience path to driving skills and lifestyle, personality factors and beliefs path to driving behaviors are described schematically (Lajunen & Özkan, 2011). However, while this may be the schema of actual driving skills and driving behaviors that lead to the accident,

different schematic drawings could also be taken into account while discussing the "reported" driving skills rather than actual measurement.

In Sümer's contextual model (2003), which is another schematic representation leading to an accident, known and used in the field, driving skills, and driving behaviors could be seen in the diagram leading to an accident, under the same title, among the second step factors (See in Figure 4). Especially driving behaviors and safety skills are investigated under the second step context. However, as in the previous figure, although it could be expected for driving behaviors to be second step still, a bit of a question mark could be for DSI here too. While driving skills are measured by DSI and reported driving skills rather than actual, this construct could be similar to measurement of other personality characteristics, people's thoughts, judgments, cognitions, or attitudes in their measurement nature (Sümer, 2003). Moreover, apart from the self-reported version of driving skills measures, Evans (1991) and Elander and his colleagues (1993) also argued about driving and driving-related skills, especially skills like information-processing driving skills, could be investigated under first step. In this argument, while it is considered that even the actual driving skills could be first step, the reported driving skills place under second step could be logical.

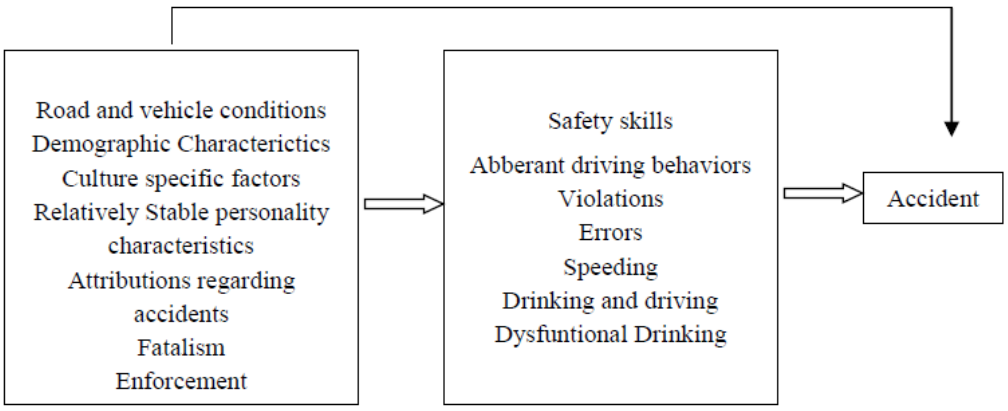

Figure 4. Contextual Mediated Model to Accident (Taken from Sümer, 2003)

All in all, collectively, all the information and all the studies mentioned above emphasize the importance of working especially driving skills and behaviors, and the importance of the relationship between these two factors to support general

road safety. On the other hand, while examining these constructs, attention should be given to what is measured and what should be measured. In this study, the main area of interest is self-reported driving skills and aberrant driving behaviors. In the light of the previous discussion, the relationship between reported driving skills and aberrant behaviors will be examined as proposed model from now on could be seen in Figure 5. This study will generally take driving behaviors as behavioral output which might lead to an accident.

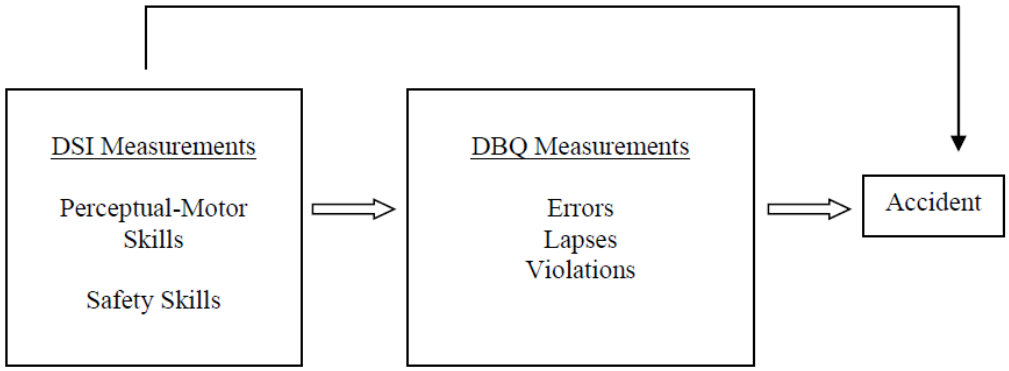

Figure 5. Proposed Relationship of DSI and DBQ

1.3.1. Factors Related to Relationship between Driving Skills and Driving Behaviors

As mentioned before, a lot of work has been done on this relationship, and accordingly, many factors have been examined within the scope of the relationship between driving skills and behaviors s with in-depth research. It has come across a lot of concepts related to this relationship, such as driver experience, personality (Lajunen & Summala, 1995), age, and age-related factors (Anstey, Wood, Lord, &Walker 2005; Shope & Bingham, 2008), gender (Oltedal & Rundmo, 2006), mood states (Garrity & Demick, 2001), aggressiveness (Yang, Li, Guan, & Jiang, 2022), intoxication (White, 1989), distraction (Engelberg, Hill, Rybar, & Styer, 2015), and cross-cultural factors (Özkan & Lajunen, 2006).

In this study, apart from these relevant factors and explained relationships, the relationship between reported driving skills and driving behaviors will be examined with a different point of view and a different focus. That is, if the issue is primarily on evaluations of own driving skills, the main focus should be primarily on conditions in which people think their skills are. For instance, it was mentioned that when people think that their skills are superior, they might be overconfident, more safety margins are opened and more violations are made (Lajunen & Özkan, 2011, Lajunen, Corry, Summala, & Hartley, 1998). One of these overconfident groups is young-male drivers or impulsive drivers (Wohleber & Matthews, 2016). Other groups who thought their driving diminished or not developed enough could be new users (Scott-Parker, 2012), drivers who are impaired in some way, the elderly (Freund, Colgrove, Burke, McLeod, 2005), or groups who had an accident or were traumatized by an accident (Senserrick, 2006). What usually happens here is, when a driver continues driving while experiencing driving avoidance, or phobia, that is, in a condition of being anxious, s/he may experience more unintentional aberrant behaviors because they cannot provide cognitive balance somehow as it was mentioned in the previous parts (Azık, 2015; Motak, Gabaude, Bougeant, & Huet, 2014).

The overconfidents became the group that literature has already focused on. However, the other group (i.e. “not so confident” ones) seems to be the subject of limited studies, since they are generally considered to be the ones who are avoiding doing the task of driving or included in the clinical group classification. To explain more clearly, in numerous previous studies, different investigations have been done on the people who reported having high levels of driving skills. However, the studies investigating driving skills and behaviors with avoidant or fearful people are limited in number. It is known that people may experience some changes from time to time, either momentarily or periodically, even though they are not labeled as anxious clinically. Driving is a daily activity being affected by any internal and external factors. That is, people’s daily and/or momentarily self-evaluations can also affect their daily and/or momentarily behavior.

1.3.2. Anxiety, Anxious Cognitions, and Anxious Driving

The relationship between driving skills, behaviors, and accident involvement is complex, and one of the biggest challenges is specifically trying to understand and make sense of the psychological mechanism underlying these human factors (Elander et. al, 1993). With this enthusiasm, personality traits and emotional states have been the subject of extensive research (Shahar, 2009). For example, anger and aggression are among the leading examples in traffic safety (Deffenbacher, Huff, Lynch, Oetting, & Salvatore, 2000). However, it is known that many emotions related to negative affect are actually related to dangerous driving, and one of them is anxiety, even if it is relatively little studied. It was stated that anxiety is another main determinant of the driving concerns of people, their skills evaluations about themselves, and their evaluations of their environment (Ehlers, Hofmann, Herda, & Roth, 1994; Eysenck, Derakshan, Santos, & Calvo, 2007; Costa & McCrae, 1992; Taubman-Ben-Ari, Mikulincer, & Gillath, 2004).

Anxiety could be defined as "a feeling of tension or unease at the prospect of a threatening, but not guaranteed" (Rachmaan & Wilson, 2013). Or it could be defined as "a feeling of worry or unease about a situation that is often accompanied by physical symptoms" (DSM-V). Similar to these different definitions, the measurement of anxiety could be different it could be examined as a clinically diagnosed disorder, as well as a general trait (remain stable over time) or state (those experienced while driving or any other activity) (Deffenbacher, Lynch, Oetting, & Yingling, 2001). Although there is a predisposition to work with clinical examples in traffic safety studies, such as fear of driving (xenophobia), in fact, a milder form of driving anxiety and anxiety while driving has been more common (Stephens et al., 2020).

In some specific works done before this, especially the relations related to performance are also mentioned. Firstly, studies have presented findings that people with an anxious driving style do not have confidence in their own skills (Taubman-Ben-Ari, Mikulincer, & Gillath, 2004). The idea of these studies is

actually based on the theory that this anxiety-based condition reduces task performance by making pre-empting attentional resources (Wong, Mahar, & Titchener, 2015). To explain more clearly, there is the logic that while anxiety-prone drivers will be able to perform task-difficulty evaluations. They may perform correctly if the task is difficult enough However, when driving task demand is low, they will start making errors because their attention shifts from driving to feeling anxious and thinking about feeling anxious (Matthews, 2002). Moreover, it has been reported that anxious drivers perform worse especially in motor tasks, and pedal controls, and gear-changing are also problematic especially in maneuvers (Calvo, Alamo, Ramos, 1990). In addition, there are studies stating that anxiety level causes worsened task performance because it uses attentional resources more (Hardy, Beattie, and Woodman 2007; Sarason 1998), Although very few studies have examined it relationship between anxiety and driver performance has been also found, this finding sheds light on the relationship between performance and anxiety, albeit limited (Ulleberg, 2002).

Apart from performance, anxiety also has an effect on behavior. The direct behavioral outcome is of course, as mentioned earlier, anxious driving behaviors. Besides these, there have been other behavioral studies. Studies show that as people's negative thoughts increase, their anxiety also increases. And as this anxiety increases, people feel more insecure as their anxiety level increases, and their behaviors are shaped accordingly in traffic settings (Taylor, 2018). Therefore, it could be said that there is a link between anxiety and driving behaviors. In Shahar's study (2009) and Pourabdian and Azmoon's study (2013), this idea is proved. They reported that especially trait anxiety is associated with all 4 sub-topics of self-reported driving behaviors (errors, lapses, ordinary violations, aggressive violations). In addition to this finding, it was stated that there is a u-shaped relationship between trait anxiety and driving behaviors and that the reporting of both low and high trait anxiety due to cognitive interference may be related to negative behaviors. It has been said that very few safety concerns are risky in low anxiety, and many safety concerns may cause errors and violations as they will increase the task demand in the same way (Oltedal & Rundmo, 2006).

In addition to trait anxiety, similar findings were found to state anxiety. On the other hand, it should be noted that state anxiety measurements were generally done in simulation studies or studies that measure real-time state anxiety while driving (Barnard & Chapman, 2018).

While trying to understand the driver anxiety and anxiety while driving, it may be worthwhile to review the performance evaluations of drivers in more detail, as well. For example, the fact that the driver understands the task demand and acts accordingly, S/he has to take into account the difficulty of the current traffic conditions and evaluate his/her own skills (Brown & Groeger, 1988; Kuiken & Twisk, 2001). Here, too, self-assessment plays an important role. Because the difficulties in the environment and the thought of coping actually direct people's concerns about driving.

It is known that people generally try to idealize his/her driving performance. While people are driving or idealizing their performance, their cognitive judgments and cognitions can interfere with their performance or actions. People may have many concerns while driving, but studies focusing on the critical role of these concerns are very limited (Ehlers, Taylor, Ehring, Hormann, Deane, Roth, & Podd, 2007). On the other hand, the limited studies of the concerns that might affect driving task of drivers also provide some important information. First of all, anxiety about driving increases with these concerns about driving (Ehlers, Hofmann, Herda, & Roth, 1994). Moreover, there are studies reporting that anxiety triggers negative thoughts about driving (Eysenck, Derakshan, Santos, & Calvo, 2007). In addition to them, anxiety level reported by a driver is an important factor at this point, because this level of anxiety affects the perception and behaviors of the person regarding the traffic environment (Costa & McCrae, 1992). Studies show that people who do not have confidence in their own skills have more stress and anxiety and their driving styles are shaped accordingly (Taubman-Ben-Ari, Mikulincer, & Gillath, 2004). These findings reveal the relationship between concerns, people's thoughts about their own skills, thoughts about the traffic environment, and anxiety. Unfortunately, no large-scale studies have studied these relationships.

Studies on this subject generally come from the driving avoidance literature. Luckily, fear of driving or driving avoidance is one of the most notable topics of recent times, study these concerns. For example, when people think that their skills are not sufficient for specific traffic conditions, they may have concerns as follows. First of all, people may have concerns about causing an accident or harming themselves or others as a result of the accident. Another concern could be about the anxiety they will experience while thinking about them and the possible negative effects of this anxiety on their performance. another subgroup may have concerns about how they will perform in some difficult driving situations, such as in crowds or bad weather. In addition to these, it can be said that it consists of concerns about what other road users think about me and my performance (Taylor et. al, 2001). Although these concerns are similar to patients with social phobia or panic disorder, they may not be in a position to affect their lives as much (Ehlers et al., 2007).

Many measurement tools have been developed for panic disorders or to measure the concerns of those with social phobia, but driving-related cognitions (including accident, panic or social concerns related to traffic environment) considering the traffic safety literature seem a bit overlooked. On the other hand, even a little, some studies found negative cognitions could be related to thoughts about driving skills. Although subjects come from people with travel phobia, driving avoidance, or fear of driving, such studies show that cognitions may be relevant to people's thoughts about their skills. Moreover, in Olisan’s and his colleagues’ study, it is stated that cognitions associated with stressful situations in traffic could be a precursor to negative behaviors in traffic settings. These findings also could support the idea that cognitions could be also related to behavioral outcomes. (Olisan, Cabtini, Carvalho, & Cordoso, 2015).

Fortunately, Olisan's and his colleagues’ study is not the only study that says behavioral outcomes and cognitions may be relevant. Except for a few examples, the behavioral reflection studies of the driving cognitions studied with travel phobia were generally made by measuring anxious driving behaviors (Măirean,

2020). Anxious driving behaviors are actually the behavioral consequences of driving anxiety and cognitions (covers driving related concerns) and can be measured through these behaviors (Clapp et al., 2012). These instruments focused on the measurement of anxiety-performance deficits, exaggerated safety behaviors, and hostile behaviors.

Since these driving cognitions and anxious driving behaviors have not been studied independently on driving avoidance, it cannot be said that their full scope and effects are known. There are only two measurement tools on this subject and their usage area is almost limited.

Some studies there are focused on fear of driving stating that fear of driving directly causes some problematic behaviors. For example, findings of these studies found that fear of driving is related to aberrant behaviors, intentional violations, driving errors, reduces hazard detection, or reduced rate of obeying the rules (Mairean, 2020; Taylor et al., 2007). However, driving cognitions could not be only limited to drivers with driving fear, and driving cognitions could be related to behavioral outcomes such as aberrant driving behaviors or driving errors. Moreover, as it is mentioned before there could be a link between thoughts of driving skills and driving cognitions for not only drivers with fear and it could be another factor that affects the whole driving population to some extent.

1.3.3. Driving Skills, Cognitions, Anxiety and Behaviors all together

The driving literature is limited in studies of anxiety. However, when comprehensive studies of the general anxiety literature are examined, it is seen that a schematic representation can be created that can be adapted to driving behaviors and supports the relevant literature. This schematic representation shows us an integrative model and includes anxiety, skills and performance. Of course, skills here are not related to driving action and is again a schema for the clinical sample, especially for people with social phobia (Hopko, McNeil, Zvolensky, & Eifert, 2001). In the part of the model that interests, people's skills

reach performance deficits through cognitive biases and anxious responding channels, if they are adequate, they can reach rational response and then adequate performance (See Figure 6). If the skills are not strong enough, this can turn into performance deficits.

When the proposed model of this study and the literature information is combined, the simple traffic environment scheme can be suggested as in figure 6. That is if a person has insufficient awareness about his/her abilities, this person's driving related concerns and cognitions related to the traffic environment may turn into behavioral deficits, or with the same logic, his/her skills may turn into behavioral deficits, again with the mediator effect of anxiety.

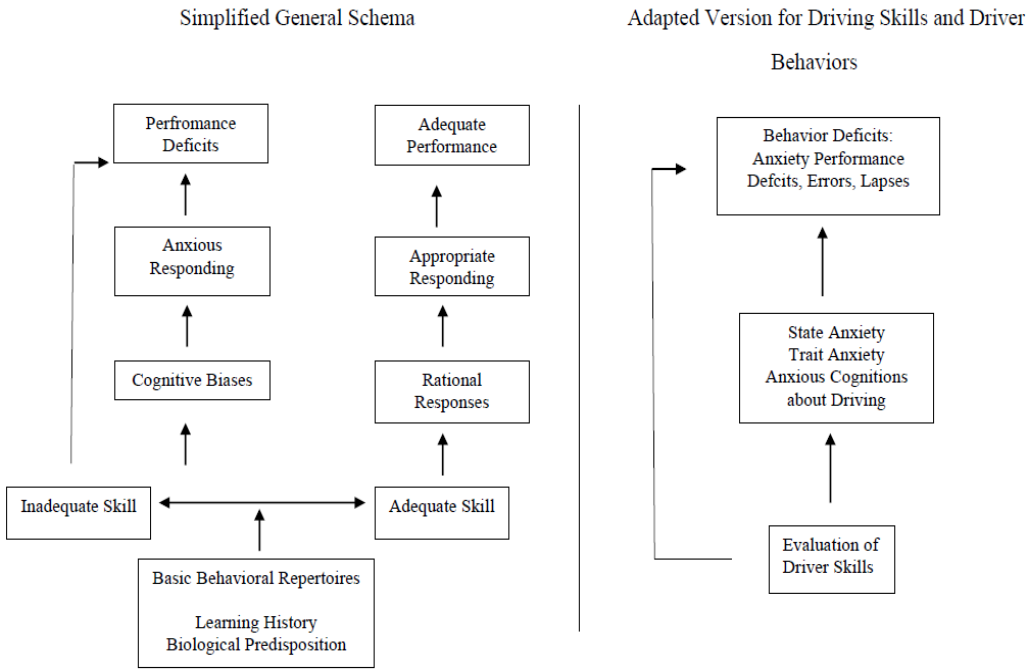

Figure 6. Simplified version of an integrative model of the relationship among anxiety, skills and performance and adaptation to the driving skills and behaviors relationship (Hopko, McNeil, Zvolensky, Eifert, 2001).

1.4. The Aim of the Present Study

Research Gap:

In the light of the information that is given above, it can be argued that although driving skills and driving behaviors are frequently investigated in the literature and their relationships are examined, anxiety-related factors have always been evaluated within limited (avoidant) or clinical groups. However, anxiety, like anger, is a negative emotional state that is frequently experienced during the day, and it is in effect while directing our actions (Deffenbacher et al., 2000).

There are not enough studies in the literature that focus on skills, anxiety, and behaviors. In fact, this limitation may be a reflection of the fact that the relationship between these variables has not been studied in anxiety research regardless of the field or context being concerned (Hopko, McNeil, Zvolensky, Eifert, 2001). For this reason, the present research is planned to be the one trying to fill that gap in traffic research area. Based on this aim, the relationship between self-reported driving skills and aberrant and anxious driving behaviors is examined in detail from a different point of view with the intervariable concerns and anxiety related to the traffic environment for the first time in the literature. There are not enough studies in the literature that focus on skills, anxiety, and behaviors. In fact, this limitation may be a reflection of the fact that the relationship between these variables has not been studied in anxiety research regardless of the field or context being concerned (Hopko, McNeil, Zvolensky, Eifert, 2001). For this reason, the present research is planned to be the one trying to fill that gap in traffic research area. Based on this aim, the relationship between self-reported driving skills and aberrant and anxious driving behaviors is examined in detail from a different point of view with the intervariable concerns and anxiety related to the traffic environment for the first time in the literature.

Lastly, with the help of this study, 2 new scales (DCQ & DBS) will be translated to Turkish, while one scale (STAI) will be re-examined and updated. While making investigation of the measures to be used in the present study, it was noticed that this research area is lack of measurement variety. The study would be the first one testing the already developed related measures and make comments for the future use of them.

The Present Study:

All in all, in the present study the role of driving-related cognitions (accident-related concerns, panic-related concerns, and social concerns), levels of trait and state anxiety are suggested as mediators in the relationship between skills and behavior. Due to the fact that this is the first study making the argued investigation between the variables of the study, and some of the measurement tools are used for the first time in this context and culture, statistical investigation of the mentioned mediation relationships will be made separately in addition to a complete model test of mediation. Accordingly, the three research questions are in the bellowed section.

Research Question 1: Is the relationship between driving skills and driving behaviors mediated by driving-related cognitions?

- This study is conducted to investigate driving-related cognitions (accident-related concerns, panic-related concerns, and social concerns) that could separately mediate the potential relationships between self-reported level of driving skills (perceptual-motor skills and safety skills) and reported anxious driving behaviors (hostile behaviors, exaggerated safety behaviors, anxiety-based performance deficits) and aberrant behaviors (lapses, errors, ordinary and aggressive violations). Proposed model could be seen in Figure 7.

Research Question 2: Is the relationship between driving skills and driving behaviors mediated by state and trait anxiety levels of the drivers?

- This study is conducted to examine state and trait anxiety levels that could separately mediate the potential relationships between self-reported levels of driving skills (perceptual-motor skills and safety skills) and reported anxious driving behaviors (hostile behaviors, exaggerated safety behaviors, anxiety-based performance deficits) and aberrant (lapses,

errors, ordinary and aggressive violations) and positive driving behaviors. Proposed model could be seen in Figure 8.

Research Question 3: Is the relationship between driving skills and driving behaviors mediated by both driving-related cognition and level of anxiety when they are included in the model at the same time?

- This study is conducted to investigate driving-related cognitions (accident-related concerns, panic-related concerns, and social concerns) and state and trait anxiety levels that could work as parallel mediators for the potential relationships between self-reported levels driving skills (perceptual-motor skills and safety skills) and reported anxious driving behaviors (hostile behaviors, exaggerated safety behaviors, anxiety-based performance deficits) and aberrant behaviors (lapses, errors, ordinary and aggressive violations). Proposed model could be seen in Figure 9.

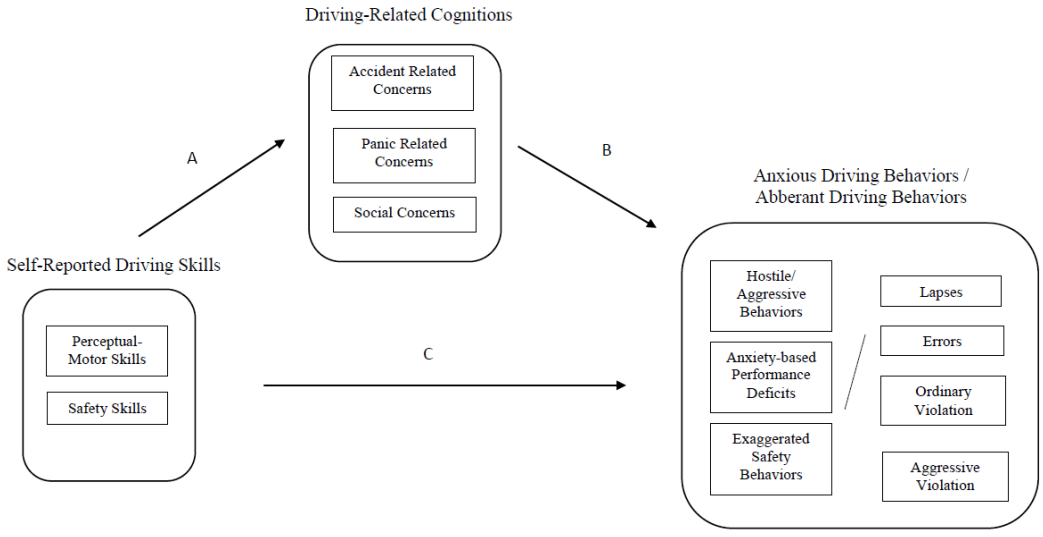

Figure 7. Hypothesized mediation model 1: Driving-related cognitions mediating the relationship between reported driving skills and driving behavior.

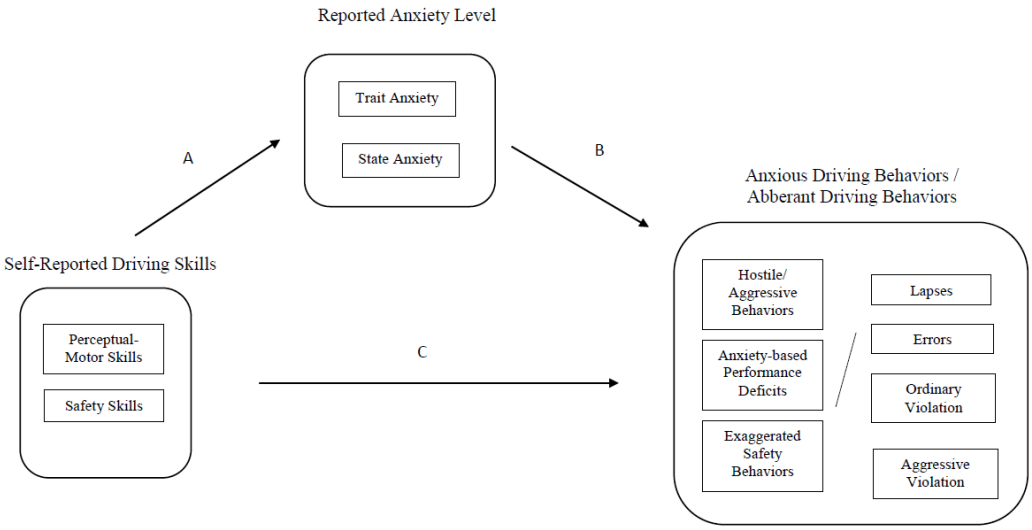

Figure 8. Hypothesized mediation model 2: Anxiety level of the participants mediating the relationship between reported driving skills and driving behavior.

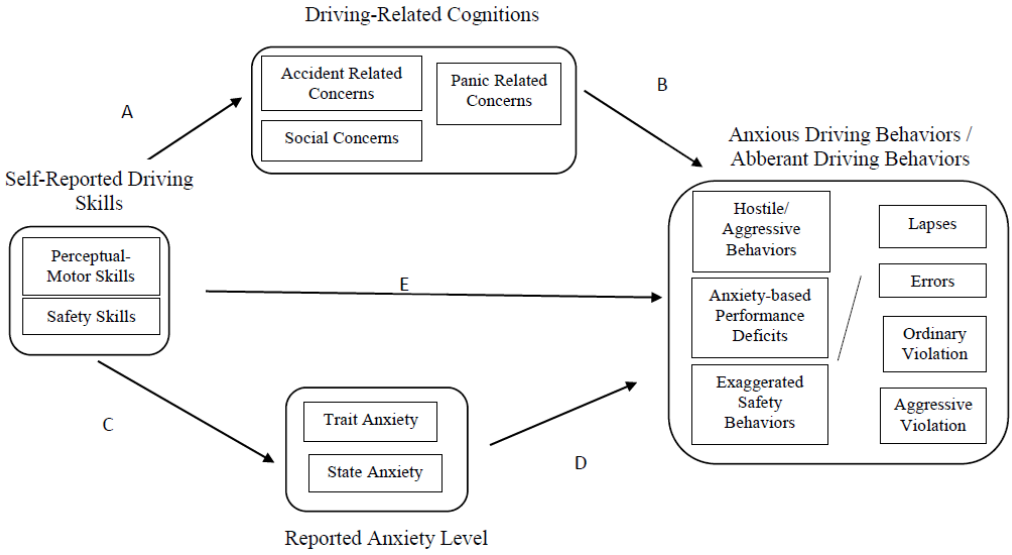

Figure 9. Hypothesized mediation model 1: Driving-related cognitions mediating the relationship between reported driving skills and driving behavior

CHAPTER 2

METHOD

2.1. Participants

A total of 484 drivers participated in the study. The participants were aged 18 to 71 (M = 32.56, SD = 8.42) and were from both rural and urban backgrounds. Just over half of the sample was female (*N* = 260; 53.7%), the other part of the participants was male (*N* = 222; 45.9%), and 2 of the participants did not want to answer gender questions (0.4%). Moreover, as the first step of demographic information of the sample, educational information screening was also performed and it is found that 48 of the participants (9.9%) had a doctoral degree, 107 of the participants (22.1%) had a master's degree, 283 of the participants (58.5%) graduated from university, 43 of the participants (8.9%) graduated from high school and lastly, three of the participants (0.6%) graduated from secondary school.

The second part of the demographics measurement included driving-related information of participants. Firstly, the respondents had a driving license for an average of 10.01 years (*SD* = 8.75) and the past year's mileage mean value was found as 10,522 (*SD* = 17,967.06). Mean value of last 3-year total accident frequency was found as 0.79 (*SD* = 1.14, min. = 0, max = 6). Of these accidents, the reported in-fault accident frequency was ranged between 0 and 4 (*M* = 0.35, *SD* = 0.67) and the reported active accident were ranged between 0 and 4 (*M* = 0.39, *SD* = 0.74). In addition to this information, the traffic penalty information was also taken from participants. The reported penalty information was parking tickets (*M* = 0.43, *SD* = 1.29, min. = 0, max. = 11), overtaking penalty (*M* = 0.01,

SD = 0.08, min. = 0, max. = 1), speeding ticket (*M* = 0.41, *SD* = 1.26, min. = 0, max. = 15), red-light penalty (*M* = 0.09, *SD* = 0.36, min. = 0, max. = 3), and lastly other penalties (e.g. missing equipment, and broken headlight) (*M* = 0.09, *SD* = 0.38, min. = 0, max. = 5).

The third phase of the demographics included information related to travel patterns. Firstly, mean value of the chosen speed information reported as 107.26 (*SD* = 19.62, min. = 40, max. = 200) for intercity roads and 67.37 (*SD* = 18.05, min. = 30, max. = 132) for inner-city roads. Lastly, the reported frequency of driving in various conditions ranged from 1 (every day to never), and the mean value for the winter months was 2.31 (*SD* = 1.85), for heavy traffic was 3.54 (*SD* = 1.84), for the highway was 3.87 (*SD* = 1.71), for another main road was 2.43 (*SD* = 1.75), for inner-city roads were 2.08 (*SD* = 1.67), for inter-city roads were 4.25 (*SD* = 1.51) and lastly for usually, in any case, was 2.39 (*SD* = 1.85). Demographic characteristics of the sample are presented in Table 1.

Table 1. Basic Demographic Characteristics of the Participants

	N	**Mean**	**SD**	**Min.- Max.**
Age	484	32.56	8.42	18-71
Gender	260 female (53.7%)		222 male (45.9%)	
Driver License Year	471	10.01	8.75	1-49
Last Year Mileage	474	10,522	17,967.06	0-150,000
Last 3-Year Accident Frequency	484	0.79	1.14	0-6
Last 3- Year In-Fault Accident Frequency	484	0.35	0.67	0-4
Last 3-year Active Accident Frequency	484	0.39	0.74	0-4
Parking Tickets	484	0.43	1.29	0-11
Overtaking Penalties	484	0.01	0.08	0-1
Speeding Tickets	484	0.41	1.26	0-15
Red-Light Penalties	484	0.09	0.36	0-3
Other Penalties (e.g. missing equipment, and broken headlight)	484	0.09	0.38	0-5

2.2. Measurements

2.2.1. Demographic Information Form

Prior to the application of the main survey package, participants received an informed consent form (see Appendix B). After that, subjects were asked to complete a demographic information form that includes descriptive variables such as age, gender, last year's mileage, passive and in-fault accident frequency and traffic tickets, and penalties frequency of the participants. Furthermore, the demographic form included information related to chosen travel patterns of the participants. Examples of this information are reported frequency in winter, heavy traffic, main roads, inter-city roads, inner-city roads, and any case (see Appendix C).

2.2.2. Driver Skill Inventory

The demographic form was followed by the application of the Driver Skill Inventory (DSI) to measure self-assessment of their skills concerning different aspects of driving. Driver Skill Inventory (DSI) is a self-report measure that includes 20 items and 2 subscales, developed by Lajunen and Summala (1995). The measurement was done by 5-point Likert-type from 1 (very weak) to five (very strong), which means higher scores pointed to a higher level of skills. The subscales are perceptual-motor skills (13 items) including fluid driving skills and safety skills (7 items) including avoiding unnecessary risks and respondents evaluated themselves by answering how skillful and how weak or strong for a particular skill they considered themselves (see Appendix D).

The Turkish version of the scale was previously translated into Turkish and had been providing good reliability and validity coefficient for the Turkish population and this Turkish version provided by Lajunen and Özkan (2004) was used in this study. For this present study, internal consistency reliability coefficients of the

subscales were also screened. Cronbach's alpha values of subscales were reported as .90 for perceptual-motor skills, and .78 for safety skills.

2.2.3. Driving Cognition Questionnaire

The Driving Cognition Questionnaire (DCQ) was designed to measure the frequency of driving-related cognition and anxiety-based concerns of the subjects and was developed by Ehlers, Taylor, Ehring, Hofman, Deane, Roth, and Podd in 2007. It comprised 20 items and participants were asked to answer a 5-point Likert scale (0 = Never to 4 = Always) to measure how often each thought occurs while driving and higher scores mean more negative driving-related concerns.

The original scale contains 3 subscales that covered panic-related cognitions, concerns about causing an accident, and social concerns. Subscales were labeled as panic-related concerns, accident-related concerns, and social concerns. Panic-related concerns were measured by 7 items and mainly focused on similar concerns experienced by individuals with panic disorder or driving agoraphobia. The examples of these subscale items could be "I will tremble and not be able to steer." or "I will be trapped.". The other subscale includes 7 items as well to measure accident-related concerns. This subscale generally includes the occurrence of an accident and what may happen to it as a result of that accident. ''I cannot control whether other cars will hit me." or "I will injure someone" could be the sample items for this scale. The last subscale which is social concerns generally contains thoughts about others' social judgments. Social concerns of the participants were measured by 6 items and "Other people will notice that I am anxious" and "People will laugh at me" are the items of this subscale (Ehlers et al., 2007; Taylor, Stephens & Sullman, 2021).

The original scale was English and the reliability, validity, and internal consistency were reported as good (Ehlers et al., 2007). For this study, it was translated to Turkish by the researchers and three of her colleagues through translation and back-translation techniques. In the adaptation phase, factor

structure analyses were done. New factor structure and internal consistency reliability coefficients of the new subscales were reported in the results section. The translated version could be seen in Appendix E.

2.2.4. State-Trait Anxiety Inventory

The anxiety level of the participants was assessed by the State-Trait Anxiety Inventory (Spielberger, Gorscuh, Lushene, Vagg, & Jacobs, 1983). This measurement tool consists of short statements, comprising two separate sub-scales that generally only give information about what is felt at that moment (state anxiety) and also measure persistent tendencies about how threatening stressful situations are (trait anxiety). Each scales consist of 20 short statements (in total 40 items) and participants are asked to answer on a 4-point Likert Scale ranging from 1 (almost never) to 4 (almost always).

This measurement tool is a frequently used anxiety scale and valid, and robust inventory that has been used since 1983. For this reason, it was translated and adapted into Turkish by Öner and Le Compte in 1983 very soon. The reliability of the studies with the Turkish adaptation version was reported between 0.83 and 0.87 for State Anxiety and between 0.94 and 0.96 for the state anxiety scale (Deniz, M.E., Dilmaç, B., & Arıcak, O. T., 2009). However, since too much time has passed since the first adaptation and translation, a new translation was made for this study both to adapt it to current language changes and to retest this measurement tool. This study was done with the translation-back-translation method and factor analysis was performed again. These processes are explained in detail in the result section. The new version of the measuring tool can also be seen in Appendix H.

2.2.5. Driving Behavior Survey

Anxious driving behaviors were measured by the Driving Behavior Survey (DBS) that is developed by Clapp, Olsen, Beck, Paleoyo, Grant, Gudmundsdottir, and

Marques in 2011. This survey is a self-report instrument consisting of 21 items, Respondents rated themselves from 1 to 7 Likert- a type scale never to always, and the higher score the participant's record meant s greater frequency of anxious driving behaviors in traffic.

The original survey includes 3 domains as hostile/ aggressive behaviors (7 items), anxiety-based performance deficit or anxiety-related performance deficits (7 items), exaggerated safety and excessively cautious behaviors, or exaggerated safety/caution behaviors (7 items). The anxiety-based hostile and aggressive behaviors subscale was designed to measure fear-based aggressive behaviors such as shouting, honking, or gesturing while driving. These types of behaviors are generally thoughts as anxiety-focused aggression reactions for this scale. Secondly, Anxiety-based performance deficit factor covered behavioral problems during driving related to maintaining proper lane position, improper speed adjustments, or just the impairments of performing basic accurate traffic operations. This type of deficit is generally assumed to be due to state-level cognitive impairments and inferences related to increased anxiety level that overwhelms the resources needed to perform driving-related tasks. Last subscale is intended to measure excessive cautious behaviors in traffic and is named exaggerated safety and excessively cautious behaviors. This type of behavior is generally used to overwhelming excessive stress but at the same time may violate typical traffic norms by driving far below the speed limit, driving excessively far away from other motorists, or reducing speed more than needed when processing roundabouts or intersections. (Clapp et al., 2011; Clapp, Sloan, Unger, Lee, Hun, Litwack & Beck, 2019).

Similar to DBS was also developed as English, and reliability, validity, and good internal consistency were tested in several studies and reported as high (Clapp et al., 2011, Clapp et al., 2019; Clapp, Baker, Litwack, Sloan, & Beck, 2014). For this current study, as it is the first application of this survey, these instruments were translated into Turkish by the researcher of this study and 3 of her colleagues by translation and back translation method. In the results section, subscales and

factor structures for the Turkish sample and internal consistency reliability coefficients were reported in detail. Moreover, the Turkish version of this survey could be seen in Appendix F.

2.2.6. Driver Behavior Questionnaire

Aberrant driver behaviors were measured by the extended version of the Driver Behavior Questionnaire (DBQ). Different versions of this questionnaire exist and based on the purpose of the studies, different unique combinations of the items were used. In this present study, the 42-item version was used with six-point Likert-type responses (0 = Never; 5 = Nearly All the Time). Higher participant scores were evaluated as more frequent behavior declarations.

The Driver Behavior Questionnaire was originally developed by Reason, Manstead, Stradling, Baxter, and Campbell in 1990. After this development phase, a new version that covers 28 aberrant behavior statements was used that is used in study of Lawton, Parker, Manstead, and Stradling (1997). In the addition of this version, 14 items covered the positive driving behaviors subscale was added that was developed by Özkan and Lajunen in 2005. The combined version that is used in these scales was composed of 5 different domains. In this questionnaire, lapses were measured by 8 items and covered behaviors like behaviors such as "forgetting where one's car is parked or driving away in third gear". The other domain is errors (measured by 8 items) and includes behaviors like "not noticing pedestrians crossing or not checking mirrors", In addition to these classes of behaviors, violations are assessed by ordinary violations (measured by 8 items) and aggressive violations (measured by 4 items) subscales. The items were covered intentional behaviors that deviate from safe driving for ordinary violations and intentional deviant behaviors with aggressive motivation for aggressive violations, Lastly, positive driving behaviors measured by 14 items and contrary to other subscales, this domain is not related to deviant behaviors, it is focused on politeness in traffic. This domain of behaviors is used to promote smooth traffic flow and polite responses for other road users (Özkan & Lajunen, 2005). Subjects

were asked to indicate how often they committed different types of lapses, errors, and violations during different traffic cases.

DBQ was translated and validated in many studies conducted for different types of driver groups in different countries (as cited in Guého, Granié, & Abric, 2014). The Turkish version of this scale was adapted by Sümer, Lajunen, and Özkan in 2002 and it had been validated for non-professional drivers in 2004 (Lajunen & Özkan, 2004). In this study, this adaptation and the addition of the positive driving behaviors subscale (Özkan & Lajunen, 2005) were used. This robust and valid questionnaire was also tested for this current study and Cronbach's alpha values of subscales were found as .80 for lapses, .73 for errors, .80 for ordinary violation, .71 for aggressive violation, and .81 for positive driving behavior. The currently used version of DBQ could be seen in Appendix G.

2.3. Procedure

Prior to the data collection process, permission was obtained from the Middle East Technical University (METU) Human Subjects Ethics Committee (HSEC) (see Appendix A). The data of this study was collected via internet and it is an online assigned study due to Covid 19 Pandemic. In order to reach people with valid driver's licenses, a text and a flyer have been prepared for dissemination on the internet and the link to this study has been added. After the permission of the ethical committee, the questionnaire battery (comprising Demographic Form, DSI, DCQ, DBS, STAI, and DBQ) with informed consent (see Appendix B) was delivered to the participants via Qualtrics software (Qualtrics software, Version [Qualtrics XM] of Qualtrics. Copyright © [2022] Qualtrics.). The flyer and the text were distributed through social media and the data was collected via a snowball sampling procedure. All participants participated in the study on a voluntary basis. Moreover, all the participants were informed about the aim, and content of the study, and also they were informed that the data would be used for a doctoral dissertation.

Before, the distribution of the study link, participant frequency was suggested as 456 (power = .95, α = .05, 4 predictors) with effect size value as 0.15. This analysis was calculated by G*Power statistical software based on power analysis (Faul, Erdfelder, Buncher, & Lang, 2009). In total, 672 participants activated the link and started to respond to the questionnaires however, 484 of them were included in the analyses based on the participation rate and data cleaning processes (return rate of 72.02%). The data were collected over a two-month period (from May to July 2020). All the data collection procedures were completed concerning the ethical guidelines and extra attention was paid to the anonymity of the participants.

CHAPTER 3

RESULTS

3.1. Analysis Plan

Prior to the main analysis, it was planned to conduct data screening and cleaning in order to prepare the data for other analyses. For the second step, it was decided to carry out factor analysis by principal axis factoring to test the factor structure of the newly translated scales and re-examined scales Driving Cognition Scale, Trait-State Anxiety Inventory, and Driving Behavior Survey for Turkish population. Next, descriptive analyzes and bivariate correlations checks were planned as a preliminary stage of understanding descriptive properties and the suitability of the planned analysis technique determined for the purpose. For the last step, as the sample size is enough according to the G-power calculations, mediation analyzes were planned for the main analysis. The mediating role of driving cognitions between driving skills and driving behaviors was planned to be tested with the PROCESS macro of Hayes (2013) for each possible relationship in line with the purpose of the study separately. The first reason for choosing PROCESS bootstrapping for mediation analysis is that it does not require a normal distribution for this analysis tool, and it gives statistically stronger results in asymmetrical distributions as well than other measurement tools (e.g. Sobel Test) and it gives also greater statistical power for testing more complex relationships, therefore rather than using other regression models, PROCESS macro was used in this study (Hayes, 2013). In addition to that tool, in order to perform and test more complex model tests, AMOS (version 26.0) software was used in SPSS.

3.2. Data Screening and Cleaning

Prior to the main analysis, first of all, data cleaning and screening were performed to improve the quality of the data. First of all, incorrectly entered data and out-of-range answers were checked, and corrections were made where necessary. After this stage, missing value research was carried out. At this point, even if 672 participated in the study, the data of 188 people with missing 4 or more values were not included in the main analysis. In addition to these techniques, univariate and multivariate outlier tests were performed. After the necessary controls, the main analyzes were continued with 484 people.

3.3. Factor Analysis of the Newly Used Scales

In this section, factor structures of the Driving Cognition Scale, Trait-State Anxiety Inventory, and Driving Behavior Survey were tested. Driving Cognition Scale and Driving Behavior Survey were used for a Turkish sample for the first time, factor structure of State-Trait Anxiety Inventory was re-examined.

3.3.1. Turkish Translation and Factor Structure of the Driving Cognition Questionnaire

Driving Cognition Questionnaire originally consisted of 3 factors: panic-related concerns, accident-related concerns, and social concerns (Ehlers et al., 2007). For this study, factor structure was also tested in order to examine the cognition of drivers in Turkey. Prior to factor structure examination, as it is the first application of this survey, these instruments were translated into Turkish by the researcher of this study and 3 of her colleagues by translation and back translation method.

Factor structure of this scale was carried out with 484 cases by a principal axis factoring (PAF) with the Promax rotation technique. As the original scale is designed to measure multi-factor, the Kaiser-Meyer Olkin index indicates that this questionnaire is high factorable and the sampling adequacy was found as .907.

Moreover, Barlett's test of sphericity was found as significant and indicated that the correlation matrix produced by the items was factorable (df = 190, p = .000).

The initial analysis showed 4 factors in total. After that random initial eigenvalues were compared with PA values and also scree plot was screened. Two examinations were compared and both of them suggested a 2-factor solution. With this interpretation, the analysis was performed by forcing the frequency of factors to two (explained 44.21% of the variance) and then three (explained 40 % of the variance) with the cut-of .30 values. At the end of this step, conceptual checks were also performed and the frequency of factors was decided and entered as two.

The first factor was comprising 9 items. Most of the items collected in this factor were related to the combination of accident and panic-related concerns. For this reason, this factor was named as "accident-panic related concerns". The initial eigenvalue of this factor was found as 7.33. (commulaties of this factor ranged between .39 and.54) Moreover, it explained 33.79% of the variance, and Cronbach's alpha value was found as .84.

The second factor was comprising 5 items and the content of the items was broadly about social concerns. Therefore, this factor was labeled as "social concerns" The initial eigenvalue of this factor was found as 1.78. Communalities ranged between .29 and .55. Moreover, it explained 6.21% of the variance, and Cronbach's alpha value was found as .81.

At the end of the analysis, 6 items with loadings lower than .30 values, and cross-loadings were dropped. The reason of the drop of "I will not be able to react fast enough/ Yeterince hızlı tepki veremeyeceğim" was the lower loading under cut-off value and the other items "-I will be unable to catch my breath/ Düzenli nefes alıp vermeye devam edemeyeceğim", "I will tremble and not be able to steer/ Titremem yüzünden direksiyonu kontrol edemeyeceğim", "My heart will stop beating/ Kalbimin duracağı", "I will not be able to move/ Hareket edemeyeceğim" and "I will lose control of myself and will acts stupidly or dangerously/

Kontrolümü kaybedeğim ve aptalca ya da tehlikeli bir şekilde davranacağım" were dropped due to cross loadings. All the values related to factor analysis and the dropped items could be seen in Table 2.

Table 2. Factor loadings based on principal axis factoring analysis with promax rotation Driving Cognition Questionnaire (N = 484)

Items/ Turkish translation	Factor 1[a]	Factor 2
4- I cannot control whether other cars will hit me./ Diğer araçların bana çarpıp çarpmayacağını kontrol edemeyeceğim.	.43	
7- I will be injured./ Yaralanacağım.	.73	
9- I will injure someone./ Birini yaralayacağım.	.75	
10- I will not be able to think clearly./ Net bir şekilde düşünemeyeceğim.	.45	
11- I will die in an accident./ Bir kazada öleceğim.	.77	
12- I will be trapped./ Trafikte sıkışıp kalacağım.	.42	
13- I will cause an accident./ Bir kazaya sebep olacağım.	.66	
14-I will be stranded. / Trafikte mahsur kalacağım.	.37	
19-People riding with me will be hurt./ Benimle seyahat eden kişilerin zarar göreceği.	.68	
2- People I care about will criticize me./ Önemsediğim insanların beni eleştireceği.		.57
5- Other people will notice that I am anxious. / Diğer insanların endişeli olduğumu fark edecekleri.		.87
8- People will think I am a bad driver./ İnsanların kötü bir sürücü olduğumu düşüneceği.		.68
15-I will hold up traffic and people will be angry./ Trafiği aksatacağım ve bu yüzden insanların bana kızacağı.		.63
17-People will laugh at me./ İnsanların bana güleceği.		.83

3.3.2. Turkish Translation and Factor Structure of Driving Behavior Survey

In the original Clapp and his colleagues' study (2011), Driving Behavior Survey was made up of three factors named as "anxiety-related performance deficits", "exaggerated safety/caution behavior" and "hostile/ aggressive behaviors". Prior to factor structure examination, as it is the first application of this survey, these

instruments were translated into Turkish by the researcher of this study and 3 of her colleagues by translation and back translation method.

Table 2. (contunied)

Dropped Items:		
1-I will not be able to react fast enough./ Yeterince hızlı tepki veremeyeceğim.		
3-I will be unable to catch my breath./ Düzenli nefes alıp vermeye devam edemeyeceğim.		
6-I will tremble and not be able to steer./ Titremem yüzünden direksiyonu kontrol edemeyeceğim.		
16- My heart will stop beating./ Kalbimin duracağı.		
18-I will not be able to move./ Hareket edemeyeceğim.		
20- I will lose control of myself and will acts stupidly or dangerously./ Kontrolümü kaybedeğim ve aptalca ya da tehlikeli bir şekilde davranacağım.		
Eigenvalues	7.33	1.78
Percent of explained variance	33.79%	6.21%
Reliability	.84	.81

Note: * Factor loadings < .3 are suppressed. [a] Factor labels. Factor 1= Accident-panic related concerns, Factor
2= Social Concerns

The same procedure was followed that is previously reported for DCQ. Factor structure of this scale was examined with 484 cases by a principal axis factoring (PAF) with the Promax rotation technique. The Kaiser-Meyer Olkin index indicates that this questionnaire is high factorable and the sampling adequacy was found as .818. Moreover, Barlett's test of sphericity was found as significant and indicated that the correlation matrix produced by the items was factorable (df = 210, p = .000).

The initial factor testing suggested 3 factors as it was found as it was found in the original scale and the conceptual checks and scree plot evaluation were also screened. The analysis was performed with the cut-of 30 values and approved as a 3-factor solution which is explained by 44.84% variance. Item loadings lower

than .30 values, and cross-loadings were examined but no item was dropped after this assessment.

The first factor covered 6 items. Most of the items collected in this factor were related to hostile driving behaviors. For this reason, this factor was named as "Hostile/aggressive behaviors". The initial eigenvalue of this factor was found as 3.75. Communalities of these items ranged between .28 and .64. Moreover, it explained 17.84% of the variance, and Cronbach's alpha value was found as .81. The second factor was comprising 8 items and the content of this factor was broadly about anxiety-based driving behaviors. Therefore, this factor was labeled as "Anxiety-based performance deficits" The initial eigenvalue of this factor was found as 3.28. Communalities of these items ranged between .37 and .60. Moreover, it explained 15.64% of the variance, and Cronbach's alpha value was found as .79.

The third factor included 7 items in total. This factor content was broadly related to safety practices while driving. Therefore, this factor was labeled as "Anxiety-based performance deficits" The initial eigenvalue of this factor was found as 2.39. Communalities were found between .26 and .55. Moreover, it explained 11.36% of the variance, and Cronbach's alpha value was found as .87 (See Table 3).

Table 3. Factor loadings based on principal axis factoring analysis with promax rotation Driving Behavior Survey (N = 484)

Items/ Turkish translation	Factor 1[a]	Factor 2	Factor 3
2- I yell at the driver/drivers who make me nervous./ Beni sinirlendiren sürücü/sürücülere bağırıyorum.	.83		
10-I make gestures at the driver/drivers who made me nervous./ Beni sinirlendiren sürücü/sürücülere el/kol/baş hareketleri yapıyorum.	.80		
18-I try to find ways to let other drivers know that they are making me nervous./ Diğer sürücülere beni sinirlendirdiklerini belli etmenin yollarını bulmaya çalışıyorum.	.78		
17-I honk my horn at the driver who made me nervous./ Beni sinirlendiren, geren sürücülere korna çalıyorum.	.75		
20-I swear/use profanity while I am driving./ Araba kullanırken küfür ediyorum.	.74		
15-I pound on the steering wheel when I'm nervous./ Gergin olduğumda direksiyona vuruyorum.	.40		
14-I have trouble finding the correct lane./ Doğru şeridi bulmakta zorluk çekiyorum.		.79	
5-I drift into other lanes./ Diğer şeritlere kayıyorum.		.69	
4-I have trouble staying in the correct lane./ Doğru şeritte kalmakta zorlanıyorum.		.68	
6-I forget to make appropriate adjustments in speed./ Hızda uygun ayarlamaları yapmayı unutuyorum.		.65	
21-I have difficulty merging into traffic./ Trafiğe karışmakta zorlanıyorum.		.56	
9-I forget where I am driving to./ Araç kullanırken nereye gidiyor olduğumu unutuyorum.		.55	
1-I lose track of where I am going./ Nereye gittiğimi hatırlamadığım anlar oluyor.		.47	
7-I let the driver who made me nervous know that I am upset./ Beni tedirgin eden sürücünün üzgün olduğumu bilmesine izin veriyorum.		.34	
11- I try to put distance between myself and other cars./ Kendi aracım ve diğer araçlar arasına mesafe koymaya çalışıyorum.			.77
8-I maintain a large distance between myself and the driver in front of me./ Önümdeki sürücü ile arama geniş bir takip mesafesi bırakıyorum.			.75
13-I try to stay away from other cars./ Diğer arabalardan uzak durmaya çalışıyorum.			.65
16-I decrease my speed until I feel comfortable./ Kendimi rahat hissedene kadar hızımı azaltıyorum.			.61
19-During bad weather, I drive more cautiously than other vehicles on the road./ Kötü havalarda, yoldaki diğer taşıtlardan daha dikkatli araç kullanıyorum.			.50
3-I slow down when approaching intersections, even when the light is green./ Kavşaklara yaklaşırken, ışık yeşil olsa bile yavaşlıyorum.			.49
12-I maintain my speed in order to calm myself down./ Kendimi sakinleştirmek amacıyla hızımı sabitliyorum .			.46
Eigenvalues	3.75	3.28	2.39
Percent of explained variance	17.84%	15.64%	11.36%
Reliability	.81	.79	.87

Note: * Factor loadings < .3 are suppressed. [a] Factor labels. Factor 1= Hostile/aggressive behaviors, Factor 2= Anxiety-based performance deficits, Factor 3= Exaggerated safety/caution behavior

3.3.3. Re-examined Turkish Translation and Factor Analysis of State-Trait Anxiety Inventory

State-Trait Anxiety Inventory was developed by Spielberg and his colleagues in 1983. The same year, it was adapted to Turkish culture by Öner and Le Compte, and validity, reliability, and norm studies were also done by these researchers (1983). On the other hand, considering the changes in the usage of daily language since then, it was concluded that some changes in the translation would be appropriate as a result of the revision of the scale. Therefore, new translations were performed and this instrument was translated into Turkish by the researcher of this study and 3 of her colleagues by translation and back translation method. After that, factor structure of this new translated version was also examined for this study. study, and in Öner and Le Compte's translation, the factor structure consists of two subscales, State and Trait Anxiety. The version that was translated in this study could be seen in Table 4 for State Anxiety subscale and in Table 4 for Trait Anxiety Subscale of STAI.

The factor structure of this newly translated inventory was examined with 484 cases by a principal axis factoring (PAF) with the Promax rotation technique. The Kaiser-Meyer Olkin index indicates that this questionnaire is high factorable and the sampling adequacy was found as .956. Moreover, Barlett's test of sphericity was found as significant and indicated that the correlation matrix produced by the items was factorable (df = 780 p = .000).

The initial factor testing suggested 2 factors as it was found in the original scale and the conceptual checks and scree plot evaluation were also examined and 2-factor solution was found as the best option. The analysis was performed with the cut-of 30 values and this 2-factor solution was explained by 47.03% variance in total. Item loadings lower than .30 values, and cross-loadings were examined but no item was dropped after this assessment. The State Anxiety Subscale covered 16 items and the content was all about state characteristics. The initial eigenvalue of this factor was found as 11.01. The communalities ranged between .46 and .72.

Moreover, it explained 38.99% of the variance, and Cronbach's alpha value was found as .93. 4 items were dropped due to lower loadings under the cut-off value and all the items and loadings could be seen in table 5. The Trait-Anxiety Subscale was comprising 11 items and the content of this factor was broadly about trait-related statements. Therefore, the original scale subscale name was used. The initial eigenvalue of this factor was found as 2.63. The communalities ranged between .32 and .70. Moreover, it explained 8.04% of the variance, and Cronbach's alpha value was found as .88 (see Table 5).

3.4. Descriptive Statistics and Bivariate Correlations of the Study Variables

Descriptive statistics including means and standard deviations, the sample size for each variable, the frequency of items in each measure, and the correlation matrix were examined. All significant relationships between variables of the present study were reported in this section, and all the other values are presented in Table 6.

Firstly, the bivariate correlations between demographic variables were examined and significant relationships of demographic variables were observed. The examination of age and the other demographic variables relationship showed that age was negatively related to education level (r = -.13, p < .01), positively related to driver license year (r = .65, p < .01), and last year mileage (r = .12, p < .05). Gender was found as negatively related to education level (r = -.15, p < .01), and positively related to driver license year (r = .14, p < .01), last year mileage (r = .21, p < .01) and last 3-year accident frequency (r = .12, p < .01). The rest of the demographic variable examination showed that last year mileage was positively related to driver license year (r = .18, p < .01), and 3-year accident frequency (r = .21, p < .01).

Table 4. Translation and factor loadings of State-Trait Anxiety Inventory – State Subscale (N = 484)

	State-Anxiety Sub-Scale Items	Past Turkish translation (Öner & Le Compte, 1983)	Current Turkish translation	Factor loadings
1	I feel calm.	Şu anda sakinim.	Sakin hissediyorum.	.56
2	I feel secure.	Kendimi emniyette hissediyorum.	Kendimi güvende hissediyorum.	-
3	I feel tense.	Su anda sinirlerim gergin.	Gerginim.	-
4	I feel strained.	Pişmanlık duygusu içindeyim.	Kasılmış hissediyorum.	-
5	I feel at ease.	Şu anda huzur içindeyim.	Ferahlık içindeyim.	.83
6	I feel upset.	Şu anda hiç keyfim yok.	Keyifsizim.	.58
7	I am presently worrying over possible misfortunes.	Başıma geleceklerden endişe ediyorum.	Olası talihsizlikler için endişeleniyorum.	-
8	I feel satisfied.	Kendimi dinlenmiş hissediyorum.	Hoşnut hissediyorum.	.72
9	I feel frightened.	Şu anda kaygılıyım.	Korkuyorum.	.73
10	I feel comfortable.	Kendimi rahat hissediyorum.	Kendimi rahat hissediyorum.	.36
11	I feel self-confident.	Kendime güvenim var.	Kendime güveniyorum.	.88
12	I feel nervous.	Şu anda asabım bozuk.	Şu anda asabım bozuk.	.60
13	I feel jittery.	Çok sinirliyim.	Sinirlerim tepemde.	.44
14	I feel indecisive.	Sinirlerimin çok gergin olduğunu hissediyorum.	Kendimi kararsız hissediyorum.	.48
15	I am relaxed.	Kendimi rahatlamış hissediyorum.	Kendimi rahatlamış hissediyorum.	.85
16	I feel content.	Şu anda halimden memnunum.	Halimden memnunum.	.73
17	I am worried.	Şu anda endişeliyim.	Endişeliyim.	.76
18	I feel confused.	Heyecandan kendimi şaşkına dönmüş hissediyorum.	Aklım biraz karışık.	.63
19	I feel steady.	Şu anda sevinçliyim.	Kendimi tutarlı hisediyorum.	.50
20	I feel pleasant.	Şu anda keyfim yerinde.	Şu anda keyfim yerinde.	.84
Eigenvalues				11.01
Percent of explained variance				38.99
Reliability				.93

Note: * Factor loadings < .3 are suppressed

Table 5. Translation and factor loadings of State-Trait Anxiety Inventory – Trait Subscale (N = 484)

	Trait-Anxiety Sub-Scale Items	Past Turkish translation (Öner & Le Compte, 1983)	Current Turkish translation	Factor loadings
21	I feel steady.	Genellikle keyfim yerindedir.	Keyfim yerindedir.	.73
22	I feel nervous and restless.	Genellikle çabuk yorulurum.	Kendimi gergin ve huzursuz hissederim.	-
23	I feel satisfied with myself.	Genellikle kolay ağlarım.	Halimden memnunum.	.79
24	I wish I could be as happy as others seem to be.	Başkaları kadar mutlu olmak isterim.	Diğer insanlar kadar mutlu olmak isterim.	-
25	I feel like a failure.	Çabuk karar veremediğim için fırsatları kaçırırım.	Kendimi bir başarısızlık örneği olarak görüyorum.	.59
26	I feel rested.	Kendimi dinlenmiş hissediyorum.	Kendimi dinlenmiş hissederim.	.87
27	I am "calm, cool, and collected".	Genellikle sakin, kendine hakim ve soğukkanlıyım.	Kendimi sakin ve kendine hakim hissederim.	-
28	I feel that difficulties are piling up so that I cannot overcome them.	Güçlüklerin yenemeyeceğim kadar biriktiğini hissederim.	Zorlukların üstesinden gelemeyeceğim kadar biriktiğini hissederim.	.55
29	I worry too much over something that really doesn't matter.	Önemsiz şeyler hakkında endişelenirim.	Değmeyecek şeyler hakkında gereğinden fazla endişelerinirim.	.36
30	I am happy.	Genellikle mutluyum.	Mutluyum.	.86
31	I have disturbing thoughts.	Her şeyi ciddiye alır ve endişelenirim.	Rahatsız edici düşüncelere sahibimdir.	-
32	I lack self-confidence.	Genellikle kendime güvenim yoktur.	Öz güven eksikliğim vardır	-
33	I feel secure.	Genellikle kendimi emniyette hissederim.	Genellikle kendimi güvende hissederim.	.70
34	I make decisions easily.	Sıkıntılı ve güç durumlarla karşılaşmaktan kaçınırım.	Kolay karar veririm.	.48
35	I feel inadequate.	Genellikle kendimi hüzünlü hissederim.	Yetersiz hissederim.	-
36	I am content.	Genellikle hayatımdan memnunum.	Hayatımdan memnunum.	-
37	Some unimportant thought runs through my mind and bothers me.	Olur olmaz düşünceler beni rahatsız eder.	Olur olmaz düşünceler kafamı kurcalar ve bu beni rahatsız eder.	-
38	I take disappointments so keenly that I can't put them out my mind.	Hayal kırıklıklarını öylesine ciddiye alırım ki hiç unutamam.	Hayal kırıklıklarımı öylesine ciddiye alırım ki aklımdan çıkaramam.	.42
39	I am steady person.	Aklı başında ve kararlı bir insanım.	İstikrarlı bir insanım.	.55
40	I get in a state of tension or turmoil as I think over my recent concerns and interests.	Son zamanlarda kafama takılan konular beni tedirgin ediyor.	Son zamanlarda üzerinde düşündüğüm konular gerginlik ve karışıklık hissetmeme sebep oluyor.	-
Eigenvalues				2.63
Percent of explained variance				8.04%
Reliability				.88

Note: * Factor loadings < .3 are suppressed.

Secondly, after demographic measurement checks, the relationships among driving skills and other variables were examined. Firstly, perceptual-motor skills were screened and it was found positively related to age (r = .11, p < .01), gender (r = .32, p < .01), driver license year (r = .24, p < .01), last year mileage (r = .33, p < .01) and 3-year accident frequency (r = .19, p < .05). Perceptual-motor skills were positively correlated with safety skills (r = .55, p < .01), hostile- aggressive behaviors (r = .14, p < .01), ordinary violations (r = .12, p < .05), aggressive violations (r = .19, p < .01), and positive driving behaviors (r = .31, p < .01); while it was negatively related to accident-panic related concerns (r = -.34, p < .01), social concerns (r = -.52, p < .01), anxiety-based performance (r = -.51, p < .01), exaggerated safety behaviors (r = -.12, p < .05), lapses (r =. -27, p < .01), and errors (r = -.14, p < .05). Safety skills were also examined and it was found that safety skills were positively correlated with age (r = .10, p < .05), driver license year (r = .17, p < .01), exaggerated-safety behaviors (r = .30, p < .01) and positive driving behaviors (r = .48, p < .01). Moreover, it was found negatively related to accident-panic related concerns (r = -.22, p < .01), social concerns (r = -.32, p < .01), hostile-aggressive behaviors (r = -.26, p < .01), anxiety-based performance deficits (r = -.39, p < .01), lapses (r = -.31, p < .01), errors (r = -.30, p < .01), ordinary violations (r = -.29, p < .01) and aggressive violations (r = -.21, p < .01).

Thirdly, driving-related cognition and concerns were also examined to check significant relationships. Accident-panic related concerns were correlated social concerns (r = .54, p < .01), anxiety-based performance deficits (r = .52, p < .01), exaggerated safety behaviors (r = .27, p < .01), lapses (r = .28, p < .01), and errors (r = .22, p < .01) positively. Social concerns were also checked and age (r = -.12, p < .05), gender (r = -.13, p < .01), driver license year (r = -.16, p < .01), last year mileage (r = -.19, p < .01) and positive driving behaviors (r = -.17, p < .01) were found as negatively related with social concerns. Moreover, it was related positively to anxiety-based performance deficits (r = .48, p < .01), exaggerated safety behaviors (r = .16, p < .01), lapses (r = .34, p < .01), and errors (r = .21, p < .01).

Fourthly, State anxiety was found as negatively related to age (r = -.10, p < .05), gender (r = -.14, p < .01), driver license year (r = -.13, p < .01), last year mileage (r = -.10, p < .05), perceptual-motor skills (r = -.31, p < .01), and safety skills (r = -.25, p < .01). In addition to these significant relationships, trait anxiety was found as negatively correlated with age (r = -.15, p < .01), education (r = -10, p < .05), driver license year (r = -.19, p < .01), last year mileage (r = -.14, p < .01), perceptual-motor skills (r = -.27, p < .01) and safety skills (r = -.27, p < .01) while positively related with state anxiety (r = .60, p < .01).

Lastly, driving behaviors measurements were examined. Firstly, hostile-aggressive behaviors were negatively correlated with age (r = -.11, p < .05), driver license year (r = -.09, p < .05) while they were positively correlated with 3-year accident frequency (r = .19, p < .01), anxiety-based performance (r = .12, p < .01), lapses (r = .12, p < .01), ordinary violations (r = .32, p < .01) and aggressive violations (r = .74, p < .01). Then, anxiety-based performance deficits were found as negatively related to age (r = -.16, p < .01), driver license year (r = -17, p < .01) and 3-year accident frequency (r = -.17, p < .01) and positive driving behaviors (r = -.18, p < .01) and found as positively related to exaggerated safety behaviors (r = .11, p < .05), lapses (r = .51, p < .01), errors (r = .39, p < .01) and ordinary violations (r = .21, p < .01). After that exaggerated safety behaviors were screened and it was positively correlated with age (r = .13, p < .01) and positive driving behaviors (r = .44, p < .01) while negatively correlated with gender (r = -11, p < .05), education (r = -.10, p < .05), last year mileage (r = -.11, p < .05), 3-year accident frequency (r = -.14, p < .01), lapses (r = -.10, p < .05), errors (r = -.15, p < .01), ordinary violations (r = -29, p < .01), and aggressive violations (r = -.19, p < .01). In addition to them lapses were negatively related to age (r = -.11, p < .05), driver license year (r = -.15, p < .01), and positive driving behaviors (r = -.18, p < .01) while they were positively related to errors (r = .68, p < .01), ordinary violations (r = .59, p < .01) and aggressive violations (r = .30, p < .01). Moreover, errors was positively correlated with gender (r = .16, p < .01), ordinary violations (r = .62, p < .01) and aggressive violations (r = .34, p < .01) and

negatively correlated with driver license year (r = -.11, p < .05) and positive driving behaviors (r = -.23, p < .01). Furthermore, correlations of violations revealed that ordinary violations were negatively related to age (r =. -21, p < .01), driver license year (r = -.11, p < .05) and positive driving behaviors (r = -.14, p < .01) and positively related to gender (r = .29, p < .01), last year mileage (r = .11, p < .05), 3-year accident frequency (r = .19, p < .01) and aggressive violations (r = .53, p < .01). Then aggressive violations were found as negatively related to age (r = -.12, p < .05), and driver license year (r = -.13, p < .01) and positively related to gender (r = .16, p < .01). Lastly, positive driving behaviors were positively correlated with age (r = .21, p < .01) and driver license year (r = .20, p < .01). All the values could be seen in Table 6.

Table 6. Correlations, means, and standard deviations of study variables

Variables	N	# Items	1	2	3	4	5	6	7	8	9	10
1- Age	484	1	1									
2- Gender	482	1	.07	1								
3- Education	484	1	-.13**	-.15**	1							
4- Driver License Year	471	1	.65**	.14**	-.00	1						
5- Last Year Mileage	474	1	.12*	.21**	.03	.18**	1					
6- 3 year Accident Frequency	484	1	-.02	.12**	.04	.01	.21**	1				
7- Perceptual-Motor Skills	484	13	.11*	.32**	-.05	.24**	.33**	.19*	1			
8- Safety Skills	484	7	.10*	.04	-.06	.17**	.05	-.02	.55**	1		
9- Accident-Panic Related Concerns	484	9	-.04	-.02	-.01	-.05	-.08	-.05	-.34**	-.22**	1	
10-Social Concerns	484	5	-.12*	-.13**	-.04	-.16**	-.19**	-.07	-.52**	-.32**	.54**	1
11- State Anxiety	484	16	-.10*	-.14**	-.03	-.13**	-.10*	-.04	-.31**	-.25**	.28**	.35**
12- Trait Anxiety	484	11	-.15**	.04	-.10*	-.19**	-.14**	-.02	-.27**	-.27**	.26**	.37**
13- Hostile/Aggressive Behaviors	484	6	-.11*	.09	.04	-.09*	.09	.19**	.14**	-.26**	.08	.07
14- Anxiety based Performance Deficits	484	8	-.16**	-.07	-.01	-.17**	-.17**	-.09	-.51**	-.39**	.52**	.48**
15-Exaggerated Safety/ Caution Behaviors	484	7	.13**	-.11*	-.10*	.07	-.11*	-.14**	-.12*	.30**	.27**	.16**
16- Lapses	484	8	-.11*	.01	.01	-.15**	-.09	.03	-.27**	-.31**	.28**	.34**
17- Errors	484	8	-.05	.16**	-.08	-.11*	.02	.02	-.14**	-.30**	.22**	.21**
18 –Ordinary Violations	484	8	-.16*	.29**	.00	-.11*	.11*	.19**	-.13*	-.29**	.07	.03
19- Aggressive Violations	484	4	-.12*	.16**	.04	-.13**	.06	.19**	.19**	-.21**	.04	-.01
		M **=**	32.56	1.46	3.32	10.01	10521.08	.79	3.58	3.83	1.88	1.81
		SD **=**	8.42	.50	.79	8.75	17967.06	1.14	.73	.53	.65	.73

Note: * Correlation significant at the .05 level (2-Tailed). **Correlation significant at the .01 level (2-Tailed). Female participants were coded as 1, and male participants coded as 2.

Table 6. Continued

Variables	N	# Items	10	11	12	13	14	15	16	17	18	19
10-Social Concerns	484	5	1									
11- State Anxiety	484	16	.35**	1								
12- Trait Anxiety	484	11	.37**	.60**	1							
13- Hostile/Aggressive Behaviors	484	6	.07	.20**	.20**	1						
14- Anxiety based Performance Deficits	484	8	.48**	.30**	.24**	.12**	1					
15-Exaggerated Safety/ Caution Behaviors	484	7	.16**	-.03	.04	-.05	.11**	1				
16- Lapses	484	8	.34**	.24**	.13**	.12*	.51**	-.10*	1			
17- Errors	484	8	.21**	.22**	.09	.08	.39**	-.15**	.68**	1		
18 –Ordinary Violations	484	8	.03	.10*	.01	.32**	.21**	-.29**	.59**	.63**	1	
19- Aggressive Violations	484	4	-.01	.13**	.11*	.74**	.08	-.19**	.30**	.34**	.53**	1
		M =	1.81	2.13	1.99	2,81	1,80	4,47	1,78	1,82	1,96	2,25
		SD =	.73	.59	.51	1,28	.76	1.06	.61	.67	.73	1.01

Note: * Correlation significant at the .05 level (2-Tailed). **Correlation significant at the .01 level (2-Tailed). Female participants were coded as 1, and male participants
coded as 2.

3.5. Mediation Analysis

In this part, the PROCESS macro analysis by Hayes–Model 4 was used in order to test the mediating role of driving cognitions (accident-panic related concerns and social concerns) on the relationship between driving skills (perceptual-motor skills, safety skills) and anxious driving behaviors (hostile/aggressive behaviors, anxiety-performance deficits and exaggerated safety/caution behaviors). The direct and indirect effects between variables were tested with an alpha level of 0.05, 95% confidence interval for indirect effect and 5000 bootstrapping iterations. In the next sections, the results are reported in an order and grouping of independent and mediator variables separately. In all analyzes, age and gender have been controlled based on the literature, but no results have changed as a result of this addition.

3.5.1. Mediation Analysis for Accident-Panic Related Concerns between Perceptual-Motor Skills and Outcome Driving Behaviors (Research Question 1)

In this section, the potential mediating role of accident-panic related concerns between perceptual-motor skills and outcome driving behaviors (aberrant and anxious driving behaviors) were tested and significant partial, parallel, and full mediations were reported.

The first mediation analysis was performed for the potential mediation role of accident-panic related concerns between perceptual-motor skills and hostile/aggressive behaviors and there was no mediating role of accident-panic related concerns found for this proposed model.

The second mediation analysis was performed for the potential mediation role of accident-panic related concerns between perceptual-motor skills and anxiety-performance deficits. Results showed that perceptual-motor skills were a significant predictor of accident-panic related concerns (B = -.30, SE = .04, 95%

CI [.-.38, --.22], β = -.33, p = .00) and accident-panic related concerns was a significant predictor of anxiety-performance deficits (*B* = .47, SE =.05, 95% CI [.37, .56], β = .40, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.40, SE = .04, 95%CI [-.48, -.31], β = -.37, p = 00). The total effect and the mediation model for these relationships could be seen in Figure 2. Moreover, all the relevant values related to this analysis could be seen in Figure 10 and Table 7.

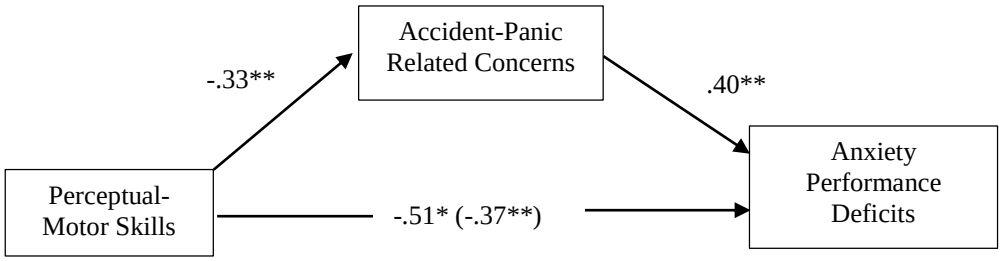

Figure 10. Standardized regression coefficients for the relationship between perceptual-motor skills and anxiety-performance deficits as mediated by accident-panic related concerns. The standardized coefficients between perceptual-motor skills and anxiety performance deficits, controlling for accident-panic related concerns are in parentheses. Note: *p<.01, **p<.001.

The third mediation analysis was performed for the potential mediation role of accident-panic related concerns between perceptual-motor skills and exaggerated safety/caution behaviors. Results showed that perceptual-motor skills were a significant predictor of accident-panic related (*B* = -.30, SE =.04, 95% CI [-.38, -.22], β = -.33, p = .00) and accident-panic related concerns was a significant predictor of exaggerated safety/caution behaviors (*B* = .42, SE =.08, 95% CI [.26, .58], β = .26, p = .00). In addition to these relationships, after controlling for the statistical effect of the mediator the mediator, perceptual-motor skills were no longer found as a significant predictor for exaggerated safety/caution behaviors which was consistent with full mediation (B = -.04, SE = .07 95%CI [-.18, .09], β = -.03, p = .54). The total effect and the mediation model for this relationship

could be seen in Figure 11. Moreover, all the relevant values related to this analysis could be seen in Table 7.

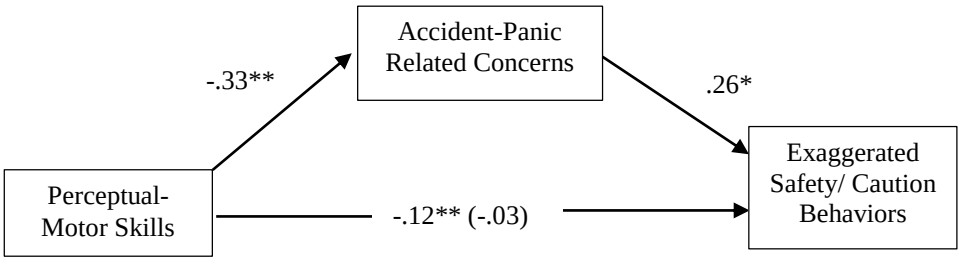

Figure 11. Standardized regression coefficients for the relationship between perceptual-motor skills and exaggerated safety/caution behaviors as mediated by accident-panic related concerns. The standardized coefficients between perceptual-motor skills and exaggerated safety/caution behaviors, controlling for accident-panic related concerns, are in parentheses. Note: *p<.01, **p<.001.

The fourth mediation analysis was performed for the potential mediation role of accident-panic related concerns between perceptual-motor skills and lapses. Results showed that perceptual-motor skills were a significant predictor of accident-panic related s (*B* = -.31, SE =.04, 95% CI [-.39, -.22], β = -.34, p = .00) and accident-panic related concerns was a significant predictor of lapses (*B* = .19, SE = .05, 95% CI [.10, .29], β = .21, p = .001). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.17, SE = .04, 95%CI [-.25, 1-.09], β = .21, p = .001). The total effect and the mediation model for these relationships could be seen in Figure 12. Moreover, all the relevant values related to this analysis could be seen in Table 7.

The fifth mediation analysis was performed for the potential mediation role of accident-panic related concerns between perceptual-motor skills and errors. Results showed that perceptual-motor skills were a significant predictor of accident-panic related concerns (*B* = -.31, SE = .04, 95% CI [-.39, -.22], β = -.34, p = .00) and accident-panic related concerns was a significant predictor of errors (*B* = .20, SE = .05, 95% CI [.10, .31], β = .20, p = .001). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-

motor skills were no longer found as a significant predictor for errors which was consistent with full mediation (B = -.06, SE = .04, 95%CI [-.16, .03], β = -.07, p = .20). The total effect and the mediation model for this relationship could be seen in Figure 13. Moreover, all the relevant values related to this analysis could be seen in Table 7.

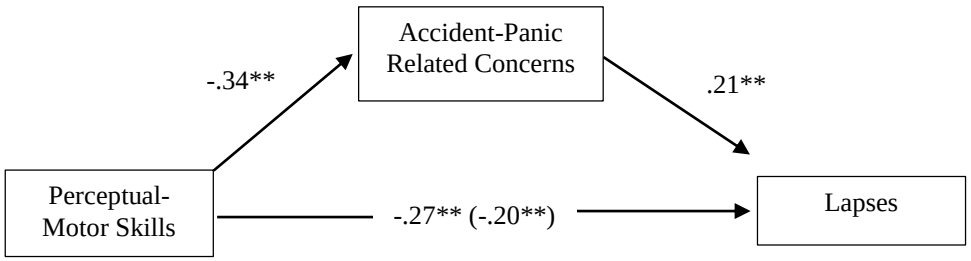

Figure 12. Standardized regression coefficients for the relationship between perceptual-motor skills and lapses mediated by accident-panic related concerns. The standardized coefficients between perceptual-motor skills and lapses, controlling for accident-panic related concerns, are in parentheses. Note: *p<.01, **p<.001.

The other mediation analysis for ordinary violations and aggressive violations were also performed for the potential mediation role of accident-panic related concerns between perceptual-motor skills and outcome behaviors however, there was no mediating role of accident-panic related concerns found for these proposed models, therefore these tested models were not being reported in this section.

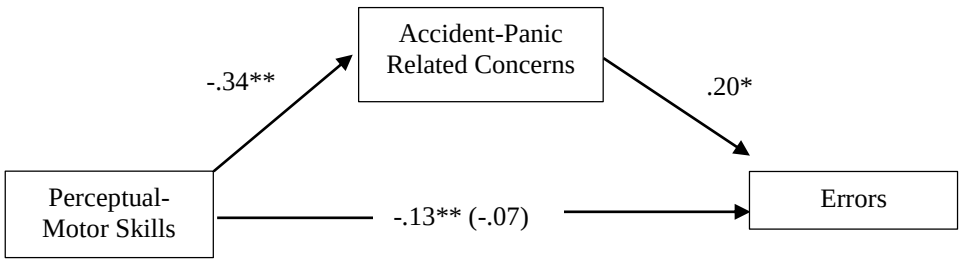

Figure 13. Standardized regression coefficients for the relationship between perceptual-motor skills and errors as mediated by accident-panic related concerns. The standardized coefficients between perceptual-motor skills and errors, controlling for accident-panic related concerns, are in parentheses. Note: *p<.01, **p<.001.

Table 7. Mediation analysis for accident-panic related concerns between perceptual-motor skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.63	.40	.36	140.77	2.00	429.000	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.36	.20	11.69	.0000	1.96	2.76
PerSkill→AccPan	-0.33	.04	-7.35	.0000	-0.38	-0.22
AccPan→AnxPerD	0.40	.05	9.96	.0000	-0.48	-0.31
PerSkill→AnxPerD (c*)	-0.37	.04	-9.96	.0000	0.37	0.56
PerSkill→ AnxPerD (c)	-0.51	.04	-12.18	.0000	-0.63	-0.45
Model summary when the outcome is exaggerated safety/caution behaviors						
R	R-sq	MSE	*F*	df1	df2	*p*
.27	.07	1.05	16.85	2.00	429.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	3.84	.34	11.13	.0000	3.17	4.52
PerSkill→AccPan	-0.33	.04	-7.35	.0000	-0.38	-0.22
AccPan→ExaSafeB	0.26	.08	5.24	.0000	0.26	0.58
PerSkill→ ExaSafeB (c*)	-0.03	.07	-0.60	.5451	-0.19	0.10
PerSkill→ ExaSafeB (c)	-0.12	.07	-2.42	.0156	-0.31	-0.03
Model summary when the outcome is lapses						
R	R-sq	MSE	*F*	df1	df2	*p*
.33	.11	.34	24.61	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.04	.21	9.85	.0000	1.63	2.44
PerSkill→AccPan	-0.34	.04	-7.13	.0000	-0.39	-0.22
AccPan→Lapses	0.21	.05	4.06	.0001	0.10	0.28
PerSkill→ Lapses (c*)	-0.20	.04	-4.00	.0001	-0.26	-0.09
PerSkill→ Lapses (c)	-0.27	.04	-5.61	.0000	-0.31	-0.15
Model summary when the outcome is errors						
R	R-sq	MSE	*F*	df1	df2	*p*
.23	.05	.42	11.18	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	1.65	.23	7.14	.0000	1.20	2.11
PerSkill→AccPan	-0.34	.04	-7.13	.0000	-0.39	-0.22
AccPan→Errors	0.20	.05	3.84	.0001	0.10	0.31
PerSkill→ Errors (c*)	-0.07	.05	-1.28	.2071	-0.16	.0.03
PerSkill→ Errors (c)	-0.13	.04	-2.70	.0072	-0.22	-0.03

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. PerSkill: Perceptual-Motor Skills, AccPan: Accident-Panic Related Concerns, HostileB: Hostile/ Aggressive Behaviors, AnxPerD: Anxiety Performance Deficits, ExaSafeB: Exaggerated Safety/ Caution Behaviors.

3.5.2. Mediation Analysis for Social Concerns between Perceptual-Motor Skills and Outcome Driving Behaviors (Research Question 1)

In this section, the potential mediating role of social concerns between perceptual-motor skills and outcome driving behaviors (aberrant and anxious driving behaviors) were tested and significant partial, parallel and full mediations were reported.

Firstly, mediation analysis was performed for the potential mediation role of social concerns between perceptual-motor skills and hostile/aggressive behaviors and exaggerated safety/causation behaviors and there was no mediating role of accident-panic related concerns found for these proposed models.

The second mediation analysis was performed for the potential mediation role of social concerns between perceptual-motor skills and anxiety-performance deficits. Results showed that perceptual-motor skills were a significant predictor of social concerns (*B* = -51, SE = .04, 95% CI [-.59, -.43], β =.-.51, p = .00) and social concerns was a significant predictor of anxiety-performance deficits (*B* = .32, SE = .05, 95% CI [.22, .42], β = .30, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.37, SE = .05, 95%CI [-.47, -28], β = -.35, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 14. Moreover, all the relevant values related to this analysis could be seen in Table 8.

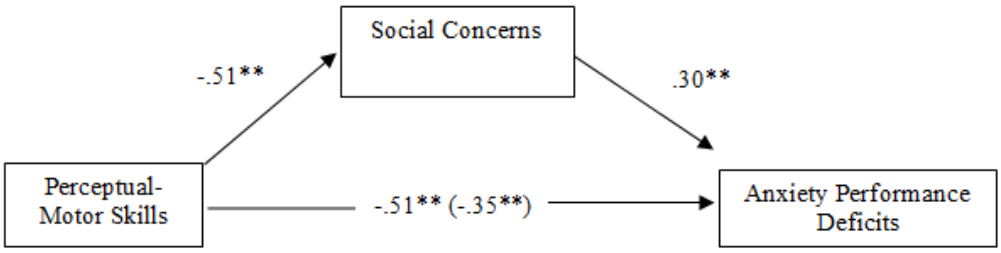

Figure 14. Standardized regression coefficients for the relationship between perceptual-motor skills and anxiety performance deficits as mediated by social concerns. The standardized coefficients between perceptual-motor skills and anxiety-performance deficits, controlling for social concerns, are in parentheses Note: *p<.01, **p<.001.

The third mediation analysis was performed for the potential mediation role of social concerns between perceptual-motor skills and lapses. Results showed that perceptual-motor skills were a significant predictor of social concerns (*B* = -.53, SE = .04, 95% CI [-.62, -.44], β = -.53, p = .00) and social concerns was a significant predictor of lapses (*B* = .22, SE = .05, 95% CI [.13, .32], β = .27, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.11, SE = .05, 95%CI [-.21, -.02], β = -.13, p = .02). The total effect and the mediation model for this relationship could be seen in Figure 15. Moreover, all the relevant values related to this analysis could be seen in Table 8.

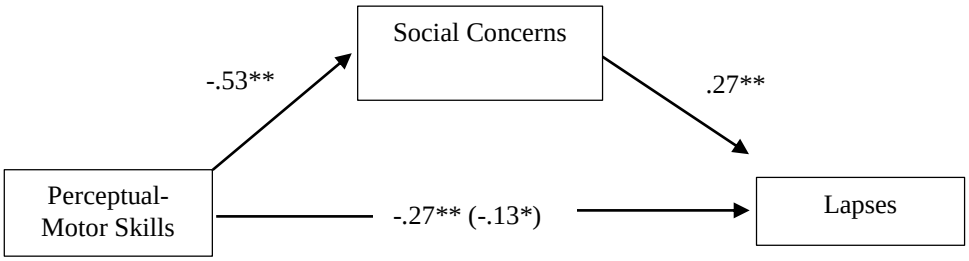

Figure 15. Standardized regression coefficients for the relationship between perceptual-motor skills and lapses as mediated by social concerns. The standardized coefficients between perceptual-motor skills and lapses, controlling for social concerns, are in parentheses Note: *p<.05, **p<.001.

The fourth mediation analysis was performed for the potential mediation role of social concerns between perceptual-motor skills and errors. Results showed that perceptual-motor skills were a significant predictor of social concerns (*B* = -.53, SE = .04, 95% CI [-.62, -.44], β = -.53, p = .00) and social concerns was a significant predictor of errors (*B* = .18, SE = .05, 95% CI [.07, .28], β = .20, p = .008). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were no longer found as a significant predictor for errors which was consistent with full mediation (B = -.03 SE = .05, 95%CI [-.13, .07], β =. -03, p = .58). The total effect and the mediation model for this relationship could be seen in Figure 16. Moreover, all the relevant values related to this analysis could be seen in Table 8.

The other mediation analysis for ordinary violations and aggressive violations were also performed for the potential mediation role of social concerns between perceptual-motor skills and outcome behaviors however, there was no mediating role of social concerns found for these proposed models, therefore these tested models were not being reported in this section.

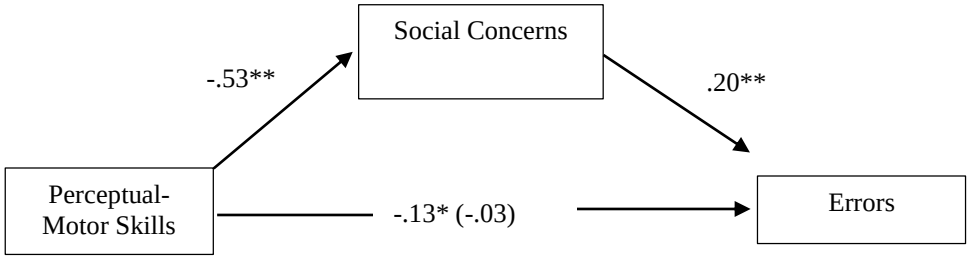

Figure 16. Standardized regression coefficients for the relationship between perceptual-motor skills and lapses as mediated by social concerns. The standardized coefficients between perceptual-motor skills and lapses, controlling for social concerns, are in parentheses Note: *p<.01, **p<.001.

After the significant partial and full mediation potential parallel mediations were also screened and it was found that there was a parallel mediation of accident-panic related concerns and social concerns between perceptual-motor skills and anxiety performance deficits. Results showed that perceptual-motor skills were a significant predictor of accident-panic related concerns (*B* = -.30, SE = .04, 95%

CI [-.38, -.22], β = -.33, p = .00) and social concerns (*B* = -.51, SE = .04, 95% CI [-.59, -.43], β = -.51, p = .00). Accident-panic related concerns was a significant predictor of anxiety-performance deficits (*B* = .40, SE = .05, 95% CI [.30, .51], β = .34, p = .00) and social concerns was a significant predictor of anxiety-performance deficits (*B* = .14, SE = .05, 95% CI [.04, .24], β = .13, p = .008). In addition to this relationship, after controlling the mediators, perceptual-motor skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial parallel mediation results (B = -.34, SE = .04, 95%CI [-.44, -.25], β = -.32, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 17. Moreover, all the relevant values related to this analysis could be seen in Table 9.

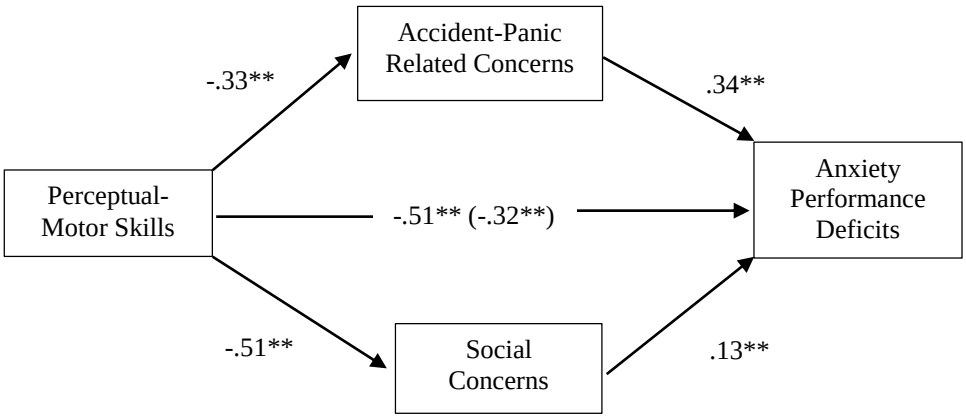

Figure 17. Standardized regression coefficients for the relationship between perceptual- motor skills, and anxiety-performance deficits as mediated by accident- panic related concerns and social concerns. The standardized coefficients between perceptual-motor skills and anxiety performance deficits, controlling for accident-panic related concerns and social concerns, are in parentheses Note: *p<.01, **p<.001.

Table 8. Mediation analysis for social concerns between perceptual-motor skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.57	.32	.40	102.61	2.00	429.00	.0000
	Coeff.	*SE*	*t*	*p*	LLCI	ULCI
Constant	2.57	.24	10.84	.0000	2.11	3.04
PerSkill→SocCon	-0.51	.04	-12.39	.0000	-0.59	-0.43
SocCon →AnxPerD	0.30	.05	6.52	.0000	0.22	0.42
PerSkill→AnxPerD (c*)	-0.35	.05	-7.60	.0000	-0.47	-0.29
PerSkill→ AnxPerD (c)	-0.51	.04	-12.18	.0000	-0.63	-0.45
Model summary when the outcome is lapses						
R	R-sq	MSE	*F*	df1	df2	*p*
.35	.13	.33	28.10	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	1.78	.23	7.78	.0000	1.33	2.23
PerSkill→ SocCon	-0.53	.04	-12.20	.0000	-0.62	-0.44
SocCon →Lapses	0.27	.05	4.79	.0175	-0.21	-0.02
PerSkill→ Lapses (c*)	-0.13	.05	-2.38	.0000	0.13	0.32
PerSkill→ Lapses (c)	-0.27	.04	-5.61	.0000	-0.32	-0.15
Model summary when the outcome is errors						
R	R-sq	MSE	*F*	df1	df2	*p*
.21	.05	.43	9.45	2.00	388.00	.0001
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	1.60	.26	6.17	.0000	1.09	2.11
PerSkill→SocCon	-0.53	.04	-12.20	.0000	-0.62	-0.44
SocCon →Errors	0.20	.05	3.38	.0008	0ö07	0.28
PerSkill→ Errors (c*)	-0.03	.05	-0.55	.5806	-0.13	0.08
PerSkill→ Errors (c)	-0.13	.05	-2.70	.0072	-0.22	-0.03

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. PerSkill: Perceptual-Motor Skills, SocCon: Social Concerns, AnxPerD: Anxiety Performance Deficits.

3.5.3. Mediation Analysis for Trait Anxiety between Perceptual-Motor Skills and Outcome Driving Behaviors (Research Question 2)

In this section, the potential mediating role of trait anxiety between perceptual-motor skills and outcome driving behaviors (aberrant and anxious driving behaviors) were tested and significant partial, parallel and full mediations were reported.

Table 9. Parallel mediation analysis for accident-panic related concerns and social concerns between perceptual-motor skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.64	.41	.36	97.53	3.00	428.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.05	.23	8.77	.0000	1.59	2.50
PerSkill→AccPan	-0.33	.04	-7.35	.0000	-0.38	-0.22
PerSkill→SocCon	-0.51	.04	-12.39	.0000	-0.59	-0.43
AccPan→AnxPerD	0.34	.05	7.71	.0000	0.30	0.51
SocCon →AnxPerD	0.13	.05	2.66	.0081	0.04	0.24
PerSkill→AnxPerD (c*)	-0.32	.05	-7.47	.0000	-0.44	-0.25
PerSkill→ AnxPerD (c)	-0.51	.04	-12.18	.0000	-0.63	-0.45

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. PerSkill: Perceptual-Motor Skills, AccPan: Accident-Panic Related Concerns, SocCon: Social Concerns, AnxPerD: Anxiety Performance Deficit.

Firstly, mediation analysis was performed for the potential mediation role of trait anxiety between perceptual-motor skills and hostile/aggressive behaviors and exaggerated safety/caution behaviors and there was no mediating role of accident-panic related concerns found for this proposed model.

The second mediation analysis was performed for the potential mediation role of trait anxiety between perceptual-motor skills and anxiety-performance deficits. Results showed that perceptual-motor skills were a significant predictor of trait anxiety (*B* = -.20, SE =, 95% CI [-.26, -.13], β = -.27, p = .00) and trait anxiety was a significant predictor of anxiety-performance deficits (*B* = .26, SE = .06, 95% CI [.13, .38], β = .17, p = .00). In addition to these relationships, after controlling for the statistical effect of the mediator, perceptual-motor skills were still a significant prediction but the power of prediction decreased, therefore, it was consistent with partial mediation results (B = -.48, SE = .04, 95%CI [-.58, -.40], β = -.45, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 18. Moreover, all the relevant values related to this analysis could be seen in Table 10.

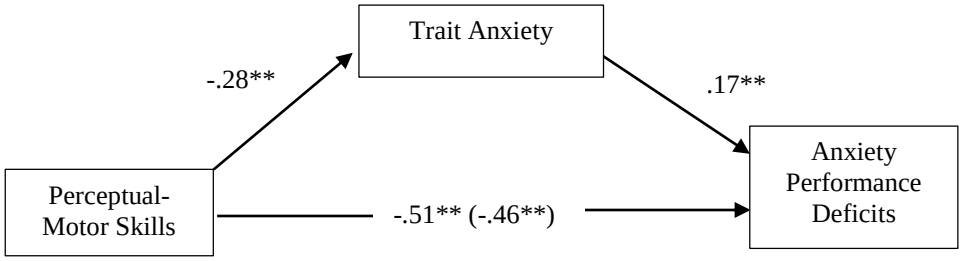

Figure 18. Standardized regression coefficients for the relationship between perceptual-motor skills and anxiety performance deficits as mediated by trait anxiety. The standardized coefficients between perceptual-motor skills and anxiety performance deficits, controlling for trait anxiety, are in parentheses. Note: *p<.01, **p<.001.

The third mediation analysis was performed for the potential mediation role of trait anxiety between perceptual-motor skills and lapses. Results showed that perceptual-motor skills were a significant predictor of trait anxiety (*B* = -.22, SE = .03, 95% CI [-.28, -.15], β = -.31, p = .00) and trait anxiety was a significant predictor of lapses (*B* = .21, SE = .06, 95% CI [.09, .33], β = -.22, p = .001). These results are consistent with the proposed mediational hypothesis. In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.19, SE = .04, 95%CI [-.27, -.10], β = -.22, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 19. Moreover, all the relevant values related to this analysis could be seen in Table 10.

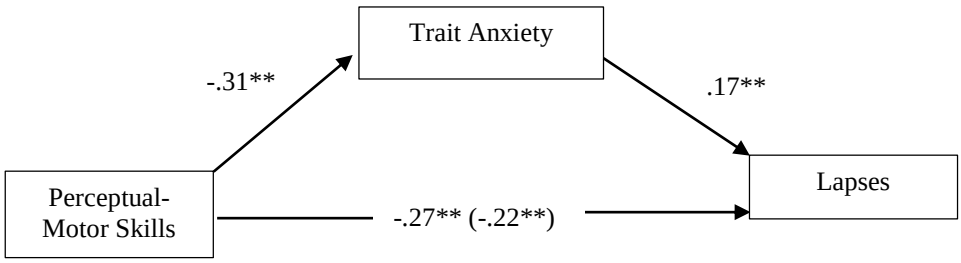

Figure 19. Standardized regression coefficients for the relationship between perceptual-motor skills and anxiety performance deficits as mediated by lapses. The standardized coefficients between perceptual-motor skills and anxiety performance deficits, controlling for lapses, are in parentheses. Note: *p<.01, **p<.001.

The fourth mediation analysis was performed for the potential mediation role of trait anxiety between perceptual-motor skills and errors. Results showed that perceptual-motor skills were a significant predictor of trait anxiety (*B* = -.22, SE = .03, 95% CI [-.28, -.15], β = -.31, p = .00) and trait anxiety was a significant predictor of errors (*B* = .25, SE = .07, 95% CI [.11, .39], β = .19, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, perceptual-motor skills were no longer found as a significant predictor for errors which was consistent with full mediation (B = -.07, SE = .05, 95%CI [-.16,.02], β = -.08, p = .14). The total effect and the mediation model for this relationship could be seen in Figure 20. Moreover, all the relevant values related to this analysis could be seen in Table 10.

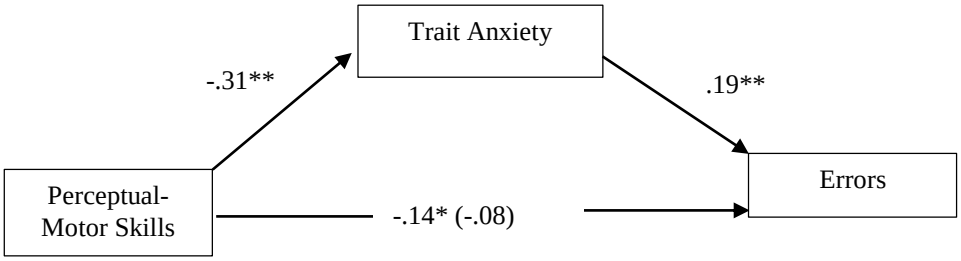

Figure 20. Standardized regression coefficients for the relationship between perceptual-motor skills and anxiety performance deficits as mediated by errors. The standardized coefficients between perceptual-motor skills and anxiety performance deficits, controlling for errors, are in parentheses. Note: *p<.01, **p<.001.

The other mediation analysis for ordinary violations and aggressive violations were also performed for the potential mediation role of social concerns between safety skills and outcome behaviors however, there was no mediating role of social concerns found for these proposed models, therefore these tested models were not being reported in this section.

3.5.4. Mediation Analysis for Accident-Panic Related Concerns between Safety Skills and Outcome Driving Behaviors (Research Question 1)

In this section, the potential mediating role of accident-panic related concerns between safety skills and outcome driving behaviors (aberrant and anxious driving behaviors) were tested and significant partial, parallel and full mediations were reported.

Table 10. Mediation analysis for trait anxiety between perceptual-motor skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq.	MSE	*F*	df1	df2	*p*
.53	.28	.43	84.86	2.00	429.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	3.05	.24	12.95	.0000	2.59	3.51
PerSkill→TraitAnx	-0.28	.03	-6.02	.0000	-0.26	-0.13
TraitAnx →AnxPerD	0.17	.06	4.01	.0001	0.13	0.38
PerSkill→AnxPerD (c*)	-0.46	.04	-10.78	.0000	-0.58	0.40
PerSkill→ AnxPerD (c)	-0.51	.04	-12.18	.0000	-0.63	-0.45
Model summary when the outcome is lapses						
R	R-sq	MSE	*F*	df1	df2	*p*
.32	.10	.34	21.90	2.00	388.00	0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.04	.23	8.92	.0000	1.59	2.48
PerSkill→ TraitAnx	-0.31	.03	-6.51	.0000	-0.28	-0.15
TraitAnx →Lapses	0.17	.06	3.38	.0008	0.09	0.33
PerSkill→ Lapses (c*)	-0.22	..04	-4.34	.0000	-0.27	-0.10
PerSkill→ Lapses (c)	-0.27	.04	-5.61	.0000	-0.31	-0.15
Model summary when the outcome is errors						
R	R-sq	MSE	*F*	df1	df2	*p*
.22	.05	.42	10.40	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	1.57	.25	6.18	.0000	1.07	2.07
PerSkill→ TraitAnx	-0.31	.03	-6.51	.0000	-0.28	-0.15
TraitAnx →Errors	0.19	.07	3.64	.0003	0.11	0.39
PerSkill→ Errors (c*)	-0.08	.05	-1.46	.14	-0.16	0.02
PerSkill→ Errors (c)	-0.13	.05	-2.70	.0072	-0.22	-0.03

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. PerSkill: Perceptual-Motor Skills, TraitAnx: Trait Anxiety, AnxPerD: Anxiety Performance Deficits.

The first mediation analysis was performed for the potential mediation role of accident-panic related concerns between safety skills and hostile/aggressive behaviors and exaggerated safety/caution behaviors and there was no mediating role of accident-panic related concerns found for this proposed model.

The second mediation analysis was performed for the potential mediation role of accident-panic related concerns between safety skills and anxiety-performance deficits. Results showed that safety skills were a significant predictor of accident-panic related concerns (*B* = -.26, SE = .06, 95% CI [-.37, -.14], β = -.21, p = .00) and accident-panic related concerns was a significant predictor of anxiety-performance deficits (*B* = .54, SE = .05, 95% CI [.45, .63], β = .46, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.43, SE = .06, 95%CI [-.55, -.32], β =.-.29, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 21. Moreover, all the relevant values related to this analysis could be seen in Table 12.

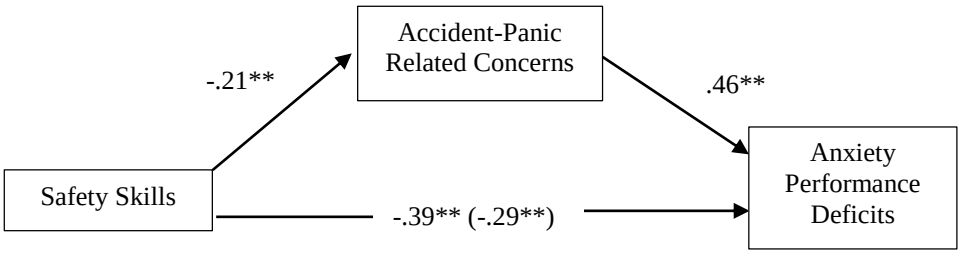

Figure 21. Standardized regression coefficients for the relationship between safety skills and anxiety performance deficits as mediated by accident panic related concerns. The standard coefficients between safety skills and anxiety performance deficits, controlling for accident- panic related concerns, are in parentheses Note: *p<.01, **p<.001.

The third mediation analysis was performed for the potential mediation role of accident-panic related concerns between safety skills and lapses. Results showed that safety skills were a significant predictor of accident-panic related concerns (*B* = -.28, SE = .06, 95% CI [-.40, -.16], β = -.23, p = .00) and accident-panic related concerns was a significant predictor of lapses (*B* = .20, SE = .04, 95% CI [.11, .29], β = .21, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.30, SE = .05, 95%CI [-.41, -.19], β = -.26, p = .00). The

total effect and the mediation model for this relationship could be seen in Figure 22. Moreover, all the relevant values related to this analysis could be seen in Table 11.

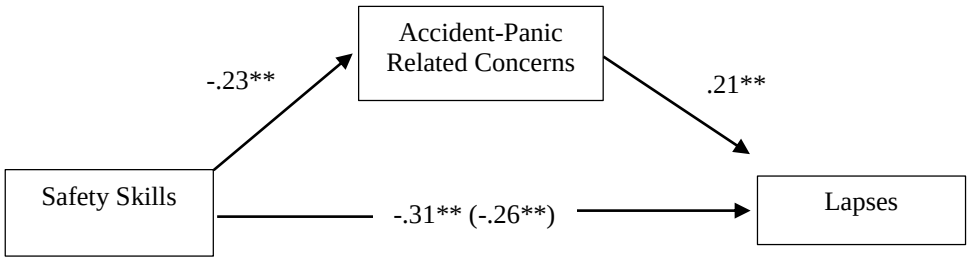

Figure 22. Standardized regression coefficients for the relationship between safety skills and lapses as mediated by accident-panic related concerns. The standardized coefficients between safety skills and lapses, controlling for accident-panic related concerns, are in parentheses Note: *p<.01, **p<.001.

The fourth mediation analysis was performed for the potential mediation role of accident-panic related concerns between safety skills and errors. Results showed that safety skills were a significant predictor of accident-panic related concerns (*B* =-.28, SE = .06, 95% CI [-.40, -.16], β = -.23, p = .00) and accident-panic related concerns was a significant predictor of errors (*B* = .17, SE = .05, 95% CI [.07, .27], β = .17, p = .001). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were no longer found as a significant predictor for errors which was consistent with full mediation (B = -.32, SE = .06, 95%CI [-.44, -.20], β = -.26, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 23. Moreover, all the relevant values related to this analysis could be seen in Table 11.

The other mediation analysis for ordinary violations and aggressive violations were also performed for the potential mediation role of accident-panic related concerns between safety skills and outcome behaviors however, there was no mediating role of accident-panic related concerns found for these proposed models, therefore these tested models were not being reported in this section.

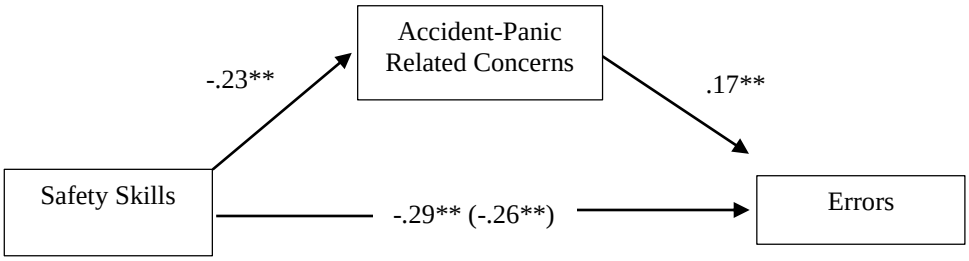

Figure 23. Standardized regression coefficients for the relationship between safety skills and errors as mediated by accident-panic related concerns. The standardized coefficients between safety skills and errors, controlling for accident-panic related concerns, are in parentheses Note: *p<.01, **p<.001.

3.5.5. Mediation Analysis for Social Concerns between Safety Skills and Outcome Driving Behaviors (Research Question 1)

In this section, the potential mediating role of social concerns between safety skills and outcome driving behaviors (aberrant and anxious driving behaviors) were tested and significant partial, parallel and full mediations were reported.

Firstly, mediation analysis was performed for the potential mediation role of social concerns between safety skills and hostile/aggressive behaviors and exaggerated safety/causation behaviors and there was no mediating role of accident-panic related concerns found for these proposed models.

The second mediation analysis was performed for the potential mediation role of social concerns between safety skills and anxiety-performance deficits. Results showed that safety skills were a significant predictor of accident-panic related concerns (*B* = -.42, SE = .06, 95% CI [-.55, -.30], β = -.31, p = .00) and social concerns was a significant predictor of anxiety-performance deficits (*B* = .43, SE = .05, 95% CI [.34, .52], β = .40, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = .43, SE = .06, 95%CI [-.52, -.27], β = -.27, p = .00). The total effect and the mediation model for this relationship

could be seen in Figure 24. Moreover, all the relevant values related to this analysis could be seen in Table 12.

Table 11. Mediation analysis for accident-panic related concerns between safety skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.60	.35	.38	118.39	2.00	429.00	.0000
	Coeff.	*SE*	*t*	*p*	LLCI	ULCI
Constant	2.45	.26	9.51	.0000	1.95	2.96
SafeSkill→AccPan	-0.21	-.06	-4.43	.0000	-0.37	-0.14
AccPan→AnxPerD	0.54	.04	11.60	.0000	0.45	0.63
SafeSkills →AnxPerD (c*)	-0.43	.06	-7.46	.0000	-0.55	-0.32
SafeSkills → AnxPerD (c)	-0.39	.06	-8.83	.0000	-0.70	-0.45
Model summary when the outcome is lapses						
R	R-sq	MSE	*F*	df1	df2	*p*
.38	.14	.32	32.02	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.56	.25	10.29	.0000	2.07	3.05
SafeSkills →AccPan	-0.23	.06	-4.59	.0000	-0.40	-0.16
AccPan→Lapses	0.22	.04	4.47	.0000	0.11	0.29
SafeSkills → Lapses (c*)	-0.26	.05	-5.45	.0000	-0.41	-0.19
SafeSkills → Lapses (c)	-0.31	.05	-6.48	.0000	-0.47	-0.25
Model summary when the outcome is errors						
R	R-sq	MSE	*F*	df1	df2	*p*
.34	.11	.37	24.86	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.73	.27	9.97	.0000	2.19	3.27
SafeSkills →AccPan	-0.23	.06	-4.59	.0000	-8.40	-0.16
AccPan→Errors	0.17	.05	3.37	.0008	-0.07	0.27
SafeSkills → Errors (c*)	-0.26	.06	-5.25	.0000	-0.44	-0.20
SafeSkills → Errors (c)	-0.29	.06	-6.10	.0000	-0.49	-0.25

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. SafeSkill: Safety Skills, AccPan: Accident-Panic Related Concerns, AnxPerD: Anxiety Performance Deficits.

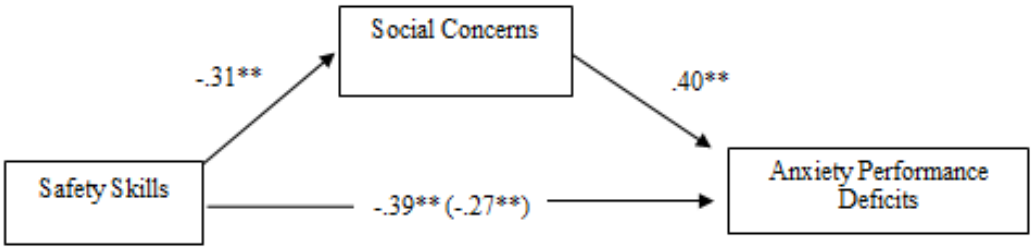

Figure 24. Standardized regression coefficients for the relationship between safety skills and anxiety performance deficits as mediated by social concerns. The standardized coefficients between safety skills and lapses, controlling for social concerns, are in parentheses Note: *p<.01, **p<.001.

The third mediation analysis was performed for the potential mediation role of social concerns between safety skills and lapses. Results showed that safety skills were a significant predictor of social concerns (*B* = -.45, SE = .06, 95% CI [-. 58, -32], β = -.33, p = .00) and social concerns was a significant predictor of lapses (*B* = .22, SE = .04, 95% CI [.14, .30], β = .26, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.26, SE = .06, 95%CI [-.37, -.15], β = -.22, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 25. Moreover, all the relevant values related to this analysis could be seen in Table 12.

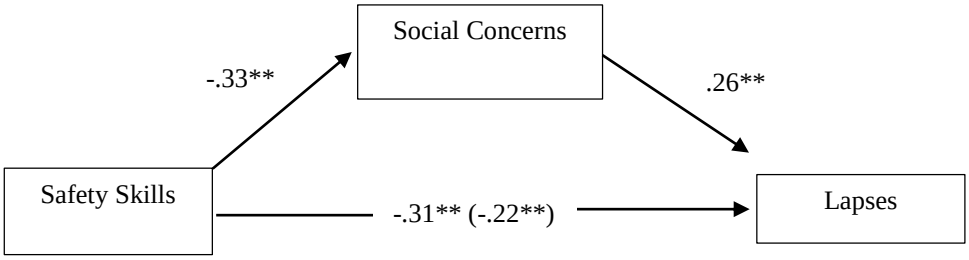

Figure 25. Standardized regression coefficients for the relationship between safety skills and lapses as mediated by social concerns. The standardized coefficients between safety skills and lapses, controlling for social concerns, are in parentheses Note: *p<.01, **p<.001

The fourth mediation analysis was performed for the potential mediation role of social concerns between safety skills and errors. Results showed that safety skills

were a significant predictor of social concerns (*B* =-.45, SE = .06, 95% CI [-.58, -.32], β = -.33, p = .00) and social concerns was a significant predictor of errors (*B* = .12, SE = .05, 95% CI [.03, .21], β = .13, p = .01). These result consistent with the proposed mediational hypothesis. In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were no longer found as a significant predictor for errors which was consistent with full mediation (B = -.31, SE = .06, 95%CI [-.44, -.19], β = -.25, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 26. Moreover, all the relevant values related to this analysis could be seen in Table 12.

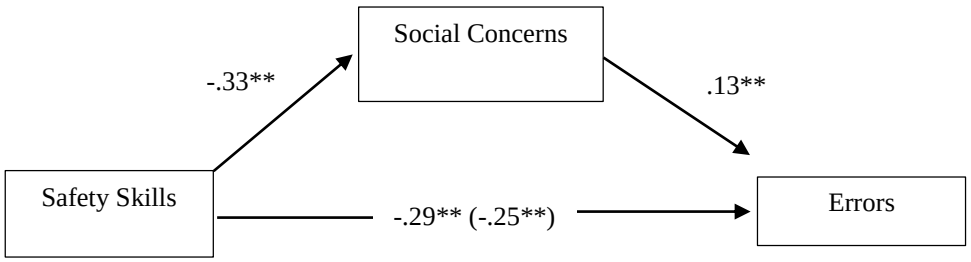

Figure 26. Standardized regression coefficients for the relationship between safety skills and errors as mediated by social concerns. The standardized coefficients between safety skills and errors, controlling for social concerns, are in parentheses Note: *p<.01, **p<.001.

The other mediation analysis for ordinary violations and aggressive violations were also performed for the potential mediation role of social concerns between safety skills and outcome behaviors however, there was no mediating role of social concerns found for these proposed models, therefore these tested models were not being reported in this section.

After the significant partial and full mediation potential parallel mediations were also screened and it was found that there was a parallel mediation of accident-panic related concerns and social concerns between safety skills and anxiety performance deficits. Results showed that safety skills were a significant predictor of accident-panic related concerns (*B* = -.26, SE = .06, 95% CI [-.37, -.14], β = -.21, p = .00) and, social concerns (*B* = -.42, SE = .06, 95% CI [-.54, -.30], β = -

.31, p = .00). Accident-panic related concerns was a significant predictor of anxiety-performance deficits (*B* =.42, SE = .05, 95% CI [.31, .52], β = .35, p = .00) and social concerns was a significant predictor of anxiety-performance deficits (*B* = .42, SE = .05, 95% CI [.31, -.52], β = .21, p = .00). In addition to these relationships, after controlling the mediators, safety skills were still a significant prediction but the power of prediction decreased, therefore, it was consistent with partial parallel mediation results (B = -.37, SE = .06, 95%CI [-.48, -245], β = -.25 p = .00). The total effect and the mediation model for this relationship could be seen in Figure 27. Moreover, all the relevant values related to this analysis could be seen in Table 13.

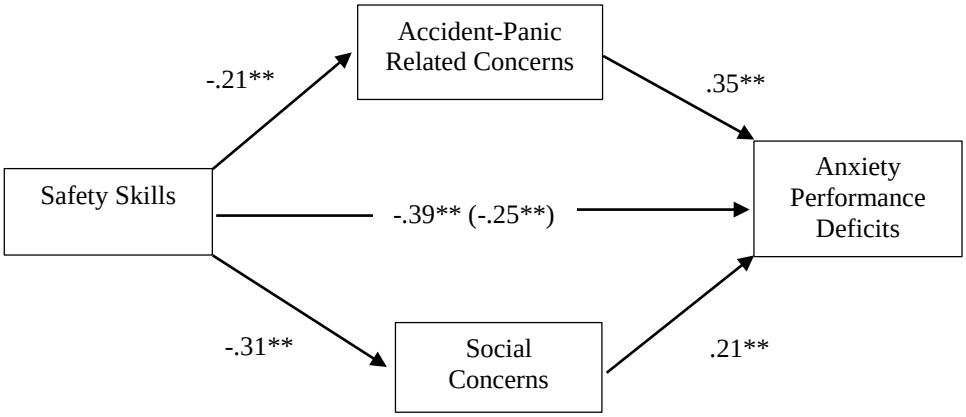

Figure 27. Standardized regression coefficients for the relationship between safety skills and anxiety performance deficits as mediated by accident panic-related concerns and social concerns. The standardized coefficients between safety skills and anxiety-performance deficits, controlling for accident–panic related concerns and social concerns, are in parentheses Note: *p<.01, **p<.001.

Table 12. Mediation analysis for social concerns between safety skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.54	.23	.42	90.78	2.00	429.00	.0000
	Coeff.	*SE*	*t*	*p*	LLCI	ULCI
Constant	2.55	.28	9.18	.0000	2.00	3.10
SafeSkill→SocCon	-0.31	.06	-6.76	.0000	-0.55	-0.30
SocCon →AnxPerD	0.40	.04	9.37	.0000	0.34	0.52
SafeSkill→AnxPer D (c*)	-0.27	.06	-6.30	.0000	-0.51	-0.27
SafeSkills → AnxPerD (c)	-0.39	.06	-8.83	.0000	-.070	-0.44
Model summary when the outcome is lapses						
R	R-sq	MSE	*F*	df1	df2	*p*
.40	.16	.32	36.69	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.37	.25	*9.36*	*.0000*	1.88	2.87
SafeSkills → SocCon	-0.33	.06	*-6.88*	*.0000*	-0.58	-0.32
SocCon →Lapses	0.26	.04	5.33	.0000	0.14	0.30
SafeSkills → Lapses (c*)	-0.22	.06	-4.57	.0000	-0.37	-0.15
SafeSkills → Lapses (c)	-.031	.05	-6.48	.0000	-0.46	-0.25
Model summary when the outcome is errors						
R	R-sq	MSE	*F*	df1	df2	*p*
.32	.10	.40	22.18	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.81	.28	*9.88*	*.0000*	2.25	3.37
SafeSkills → SocCon	-0.33	.06	*-6.88*	*.0000*	-0.58	-0.32
SocCon →Errors	0.13	.05	2.56	.0107	0.03	0.21
SafeSkills → Errors (c*)	-0.25	.06	-4.96	.0000	-0.33	-0.19
SafeSkills → Errors (c)	-0.29	.06	-6.10	.0000	-0.49	-0.25

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. SafeSkill: Safety Skills, SocCon: Social Concerns, AnxPerD: Anxiety Performance Deficits.

Table 13. Parallel mediation analysis for accident-panic related concerns and social concerns between safety skills and outcome driving behaviors.

Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.62	.38	.37	89.58	3.00	428.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.03	.27	7.58	.0000	1.51	2.56
SafeSkill→AccPan	-0.21	.06	-4.43	.0000	-0.37	-0.14
SafeSkill→SocCon	-0.31	.06	-6.76	.0000	-0.55	-0.30
AccPan→AnxPerD	0.35	.05	7.84	.0000	0.31	0.52
SocCon →AnxPerD	0.21	.05	4.58	.0000	0.13	0.32
SafeSkills →AnxPerD (c*)	-0.25	.06	-6.31	.0000	-0.48	-0.25
SafeSkills → AnxPerD (c)	-0.39	.06	-8.83	.0000	-0.70	-0.45

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident-panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. SafeSkill: Safety Skills, AccPan: Accident-Panic Related Concerns, SocCon: Social Concerns, AnxPerD: Anxiety Performance Deficits.

3.5.6. Mediation Analysis for Trait Anxiety between Safety Skills and Outcome Driving Behaviors (Research Question 2)

In this section, the potential mediating role of trait anxiety between safety skills and outcome driving behaviors (aberrant and anxious driving behaviors) were tested and significant partial, parallel and full mediations were reported Firstly, mediation analysis was performed for the potential mediation role of trait anxiety between safety skills and hostile/aggressive behaviors. Results showed that safety skills were a significant predictor of trait anxiety (*B* = -.27, SE = .04, 95% CI [-.36, -.18], β = -.28, p = .00) and trait anxiety was a significant predictor of hostile/aggressive behaviors (*B* = .38, SE = .11, 95% CI [.14, .62], β = .15, p = .002). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B =.-.52, SE = .11, 95%CI [-.75,1. -.29, β = -.22, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 28. Moreover, all the relevant values related to this analysis could be seen in Table 14.

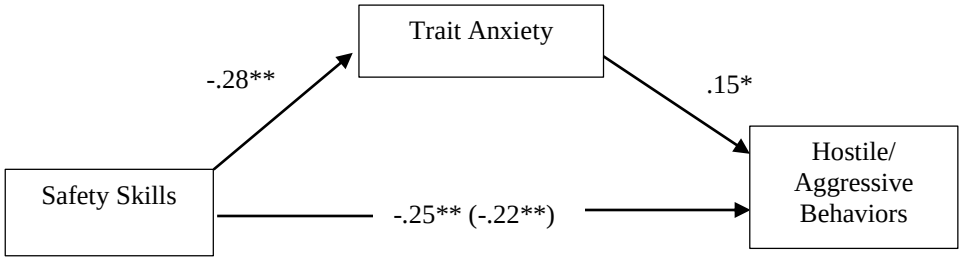

Figure 28. Standardized regression coefficients for the relationship between perceptual-motor skills and hostile/aggressive behaviors as mediated by trait anxiety. The standardized coefficients between perceptual-motor skills and hostile/aggressive behaviors, controlling for trait anxiety, are in parentheses. Note: *p<.01, **p<.001.

The second mediation analysis was performed for the potential mediation role of trait anxiety between safety skills and anxiety-performance deficits. Results showed that safety skills were a significant predictor of trait anxiety (*B* = -.27, SE = .04, 95% CI [-.36, -.18], β = -.28, p = .00) and trait anxiety was a significant predictor of anxiety-performance deficits (*B* = -.49, SE = .07, 95% CI [.18, .44], β = .21, p = .00). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.49, SE = .06, 95%CI [-62, -.36], β = -.33, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 29. Moreover, all the relevant values related to this analysis could be seen in Table 15.

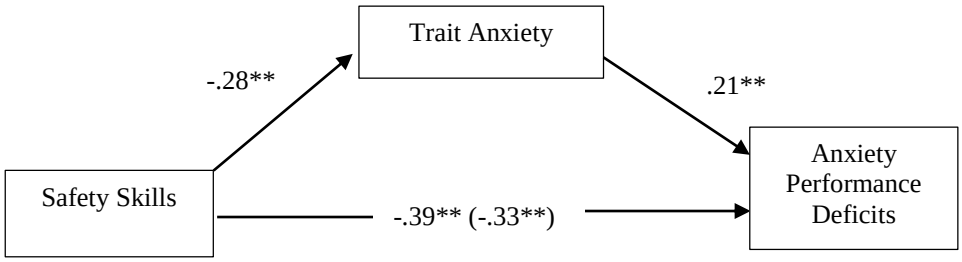

Figure 29. Standardized regression coefficients for the relationship between perceptual-motor skills and anxiety-performance deficits as mediated by trait anxiety. The standardized coefficients between perceptual-motor skills and anxiety performance deficits, controlling for trait anxiety, are in parentheses Note: *p<.01, **p<.001.

The third mediation analysis was performed for the potential mediation role of trait anxiety between safety skills and exaggerated safety/caution behaviors and there was no mediating role of trait anxiety found for these proposed models.

The fourth mediation analysis was performed for the potential mediation role of trait anxiety between safety skills and lapses. Results showed that safety skills were a significant predictor of trait anxiety (*B* = -.26, SE = .04, 95% CI [-.35, -.17], β = -.28, p = .00) and trait anxiety was a significant predictor of lapses (*B* = .20, SE = .06, 95% CI [.08, .32], β = .17, p = .001). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were still a significant prediction but the power of prediction decrease, therefore, it was consistent with partial mediation results (B = -.31, SE = .06, 95%CI [-.42, -.19], β = -.26, p = .00). The total effect and the mediation model for this relationship could be seen in Figure 30. Moreover, all the relevant values related to this analysis could be seen in Table 15.

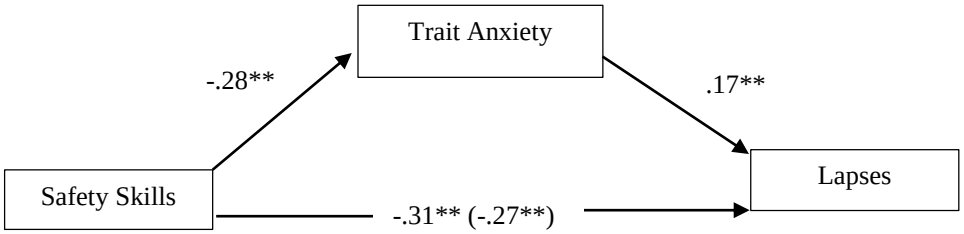

Figure 30. Standardized regression coefficients for the relationship between perceptual-motor skills and lapses as mediated by trait anxiety. The standardized coefficients between perceptual-motor skills and lapses, controlling for trait anxiety, are in parentheses Note: *p<.01, **p<.001.

The fourth mediation analysis was performed for the potential mediation role of trait anxiety between safety skills and errors. Results showed that safety skills were a significant predictor of errors (*B* = -.26, SE = .04, 95% CI [-.35, -.17], β = -.28, p = .00) and trait anxiety was a significant predictor of errors (*B* = .19, SE =.07, 95% CI [.06, .32], β = .14, p = .005). In addition to this relationship, after controlling for the statistical effect of the mediator, safety skills were no longer found as a significant predictor for errors which was consistent with full mediation (B = -.32, SE = .06, 95%CI [-.44, -.20], β = -.26, p = .00). The total effect and the

mediation model for this relationship could be seen in Figure 31. Moreover, all the relevant values related to this analysis could be seen in Table 15.

The other mediation analysis for ordinary violations and aggressive violations were also performed for the potential mediation role of trait anxiety between safety skills and outcome behaviors however, there was no mediating role of trait anxiety found for these proposed models, therefore these tested models were not being reported in this section.

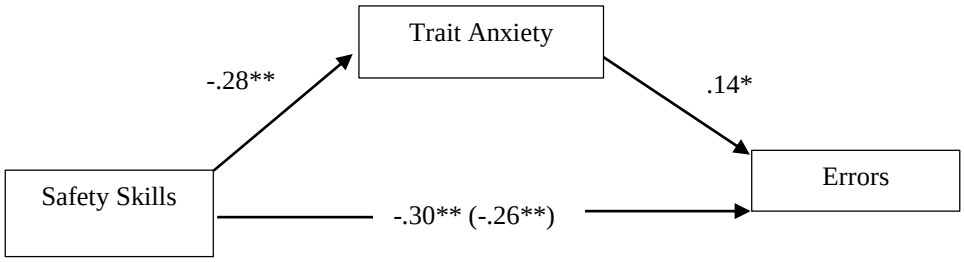

Figure 31. Standardized regression coefficients for the relationship between perceptual-motor skills and errors as mediated by trait anxiety. The standardized coefficients between perceptual-motor skills and errors, controlling for trait anxiety, are in parentheses Note: *p<.01, **p<.001.

3.6. Model Test (Research Question 3)

At the end of all mediation analyzes, the model test proposed in research question 3, in which all variables were included, was performed. This model has been tested for the significant relationships between driving cognitions and anxiety level of participants, skills, and behaviors. The model has been tested with the AMOS-SPSS program, and no significant results were found as a result of the analysis.

Table 14. Mediation analysis for trait anxiety between safety skills and outcome driving behaviors.

Model summary when the outcome is hostile/aggressive behaviors						
R	R-sq	MSE	*F*	df1	df2	*p*
.29	.09	1.49	20.49	2.00	429.00	.0000
	Coeff.	*SE*	*t*	*p*	LLCI	ULCI
Constant	4.05	.56	7.19	.0000	2.94	5.16
SafeSkill→TraitAnx	-0.28	.04	-5.95	.0000	-0.36	-0.18
TraitAnx →HostileB	0.15	.12	3.18	.0016	0.14	0.61
SafeSkills →HostileB (c*)	-0.21	.11	-4.46	.0000	-0.75	-0.29
SafeSkills →HostileB (c)	-0.26	.11	-5.50	.0000	-0.84	-0.40
Model summary when the outcome is anxiety-performance deficits						
R	R-sq	MSE	*F*	df1	df2	*p*
.44	.19	.48	51.24	2.00	429.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	3.07	.32	9.57	.0000	2.44	3.70
SafeSkills → TraitAnx	-0.28	.04	-5.96	.0000	-0.36	-0.18
TraitAnx →AnxPerD	0.21	.07	4.57	.0000	0.18	0.44
SafeSkills →AnxPerD (c*)	-0.33	.07	-7.42	.0000	-0.62	-0.36
SafeSkills → AnxPerD (c)	-0.39	.06	-8.83	.0000	-0.70	-0.45
Model summary when the outcome is lapses						
R	R-sq	MSE	*F*	df1	df2	*p*
.35	.12	.33	27.21	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.55	.28	9.15	.0000	2.00	3.09
SafeSkills → TraitAnx	-0.28	.05	-5.71	.0000	-0.35	-0.17
TraitAnx →Lapses	0.17	.06	3.36	.0008	0.09	0.32
SafeSkills → Lapses (c*)	-0.26	.06	-5.37	.0000	-0.42	-0.19
SafeSkills → Lapses (c)	-0.31	.05	-6.48	.0000	-0.47	-0.25
Model summary when the outcome is errors						
R	R-sq	MSE	*F*	df1	df2	*p*
.32	.11	.40	23.03	2.00	388.00	.0000
	Coeff.	SE	*t*	*p*	LLCI	ULCI
Constant	2.67	.30	8.74	.0000	2.07	3.27
SafeSkills → TraitAnx	-0.28	.05	-5.71	.0000	-0.35	-0.17
TraitAnx →Errors	0.14	.07	2.85	.0046	0.05	0.31
SafeSkills → Errors (c*)	-0.26	.06	-5.12	.0000	-0.44	-0.20
SafeSkills → Errors (c)	-0.29	.06	-6.10	.0000	-0.49	-0.25

Note: All presented effects are standardized; c* is the effect of perceptual-motor skills on driving outcome behaviors (controlled for accident-panic related concerns); c is total effect of perceptual-motor skills on driving outcome behaviors. SafeSkill: Safety Skills, TraitAnx: Trait Anxiety, HostileB: Hostile/ Aggressive Behaviors, AnxPerD: Anxiety Performance Deficits,.

CHAPTER 4

DISCUSSION

4.1. Discussion Overview

Driver skills and driver behaviors are the main variables that are mainly used to measure and control human factors in road traffic safety (Evans, 2004). Moreover, literature findings emphasize the importance of working especially driving skills and behavior, and the importance of the relationship between these two factors when investigating road traffic accidents. In this study, the main area of interest is driving skills and driver behaviors and their relationships from a different perspective (Özkan, Lajunen, & Summala, 2006). Although skills and behaviors have been extensively researched, information on anxious concerns and anxious driving is limited in the literature. The general reason for this limitation is that it was investigated both in the limited or avoidant driver group or in clinical groups. But anxiety is one of the most dominant negative effects and is important for our daily life.

In this current study, for the first time in the literature, driving-related cognitions (accident-panic-related concerns, and social concerns) and trait anxiety were investigated as potential mediators in self-reported driving skills' (perceptual-motor skills and safety skills) relationships with and anxious driver behaviors (hostile behaviors, exaggerated safety behaviors, anxiety-based performance deficits) and aberrant behaviors (lapses, errors, ordinary and aggressive violations) have been investigated, separately.

In the present chapter, the findings of the study were discussed based on the literature after discussing the PAF results of the Driving Cognition Questionaire,

State-Trait Anxiety Inventory, and Driver Behavior Survey. Moreover, limitations, strengths, and implications will be mentioned.

4.2. Discussion of Factor Structure Examinations

4.2.1. Discussion of the Findings Concerning Factor Structures of Driving Cognition Questionnaire

The items of Driver Cognition Questionnaire (DCQ), and Driver Behavior Survey (DBS) that were used in these present studies were factor analyzed as they were used in a Turkish sample for the first time. The original form of DCQ consists of 20 items while DBS consists of 21 items.

This scale was developed for investigated travel environment-related cognitions and the frequency of anxiety thoughts of the drivers (Ehlers et al., 2007). In the original study, types of cognitions were investigated under panic-related concerns, accident-related concerns, and social concerns. However, in this study, it seems that panic-related concerns items and accident-related items were grouped under a single factor that could be named accident-panic related concerns. Such a finding for this scale is not the first. In the study of Taylor, Stephens, and Sullman (2021) in which the factor structure of DCQ was investigated, the Cronbach alpha values of the 3-factor structures were found to be good, however, they also showed poor fit to the data. Therefore, more examination was done. It was concluded that after cross-loading item checks and removed items, and especially after scree-plot and PA, 2-factor solution was found as more reasonable. However, not as in this study, the items were combined as social-panic related and accident-related items. There may be several reasons for this, first of all, the number of samples in the original study (Ehlers et al., 2007) was very small (max. number was 50), but Taylor et.al, 2021 is closer to the number of participants in this study with 420 participants. Therefore, the original factor structure could not be stable and replicable as it was determined with not enough sample size. Concerning the sample size, this study and Taylor and his collogues (2021) study may have yielded more detailed results

in other cultures and for the general population. In addition to them, sample characteristics are also very important for factor structure examinations, only clinical samples were taken in the study of Ehler and his colleagues (2007). On the other hand, samples were taken from both clinical and general population in the study of Taylor and his colleagues (2021), while these study samples were taken directly from the general population. This can undoubtedly create differences related to the operation of the measurement tool. Moreover, the effect of the population characteristics could be also seen in the dropped items both in this study and Taylor and his colleagues study. Due to this study samples were not under directly clinical population, the items such as "I will be unable to catch my breath", "I will tremble and not be able to steer"," My heart will stop beating", or "I will not be able to move" were dropped. The reason could be these items are directly adapted from other types of anxiety and phobia scales. Moreover, these items' results were found highly correlated with typical cognitions of patients with panic disorder or PTSD in the original study that could support the importance of different population characteristics (Ehlers, et al, 2007). All in all, since it is a scale that has been used relatively rarely and its factor structure has been less tested, it is obvious that more tests are required in order to validate its factor structure.

4.2.2. Discussion of the Findings Concerning Factor Structures of State-Trait Anxiety Inventory

In addition to DCQ tools, State-Trait Anxiety Inventory was used in this study. This measurement tool was used to examine the state and trait anxiety levels of drivers and originally there are 20 items for state anxiety and 20 items for trait anxiety. This measurement tool, which was originally created in 1983 (Spielberger et al., 1983), was adapted to Turkish in the same year (Öner & Le Compte, 1983). However, because it has been nearly 40 years since the first adaptation, it was deemed appropriate to re-translate and test the factor structure of this measurement tool again.

After the necessary factor analysis examinations, two sub-factors were found in this study, as in the original study, and their contents are consistent with the state

and trait anxiety distinction. However, as in other studies in the literature, the findings were quite different. In the study conducted by Bieling and his colleagues (1998), it was reported that the state and trait sub-scales were also divided into lower order sub-factors and can be used in the measurement of not only anxiety but also depression level of participants. In addition to them, it has been reported that one of the sub-factor contents consists of rumination, worry, and disturbing thoughts, and the other consists of dysphoric mood and negative self-appraisal (Bieling, Antony, & Swinson, 1998). In another study, it has been reported that only the trait section can be divided into 2 separate factors, although their content is different from the previous study (Bados, Gomez-Benito, & Balaguer, 2010). However, in this study, instead of such a divergence, two main factors were found, such as the original study (Spielberg et al., 1983). Moreover, the reliability of the subscales was found as .93 for state scale and .83 for trait scale, similar to other Turkish adaptations that were reported between 0.83 and 0.87 for state anxiety and between 0.94 and 0.96 for the trait anxiety scale (Deniz, Dilmaç, & Arıcak, 2009).

There may be various reasons for these different separations. First of all, as it is frequently mentioned in the first study, the samples of this study and the other studies mentioned are different from each other. Clinical groups are generally used in studies with these different subscales. For example, in the study of Beijing et al. (1998), the sample is patients diagnosed with a variety of anxiety disorders. Therefore, this may be why it is not similar to this data collected from the general driver population. The reason for not using clinical samples may also be effective in the increase of cross-loading items in this current study. Moreover, this effect may have been observed more in the trait subscale for this reason (See Table 13). In addition to them, another reason for too many item drops in the trait anxiety subscale may be that the substances necessary for the driving environment are processed but other substances do not work for this population. But whatever the reason may be, future studies should focus on this measurement tool.

A review in which 816 studies on STAI were examined and reported that both content, reliability, and validity measurements have been different in different

populations and in different studies. On the other hand, apart from these differences, still, the values and these differences were between acceptable rates (Barnes, Harp, & Jung, 2002). The fact that it can be used in different samples may be a stronger feature than having different content, however, it would be appropriate to test it with other measurement tools in other studies in terms of traffic safety.

4.2.3. Discussion of the Findings Concerning Factor Structures of Driving Behavior Survey

The factor structure of DBS, which is generally used with DCQ, has been tested, as well. DBS is a measurement tool that measures the anxious behaviors of people in traffic environments (Clapp et al., 2011). Factor structure examination in the present study showed the same factor structure as the original study and there were no cross loadings or removed items. Anxiety-related performance deficits, exaggerated safety/caution behavior, and hostile/aggressive behaviors found in the study of Clapp et al. (2011) have the same name and same content with the same factor structure. Therefore, the factor structure reported by Clapp and his colleagues was largely supported in this current study as well. The findings of this study are also compatible with the literature and current factor structure shows that it is valid instrument for different driver groups as it shows the same factor structure in clinical samples (Baker et.al, 2014), mixed samples (Taylor, et.al, 2021), or directly in the general population similar to this study.

4.3. Discussion of Bivariate Correlation Analysis

In this section results of the correlation analysis for the study variables will be discussed. At first, driver skills, then driving-related cognitions, and lastly anxious and aberrant driving behaviors correlations will be examined.

The first examination was done for driver skills and it was found that perceptual-motor skills of drivers were positively related to safety skills of drivers. That is the

driver who report higher level of perceptual-motor skills also thought that s/he also was good at safety skills. This finding is contrary to what is found in the previous studies. In the literature, an asymmetric relationship was found between perceptual-motor skills and safety skills. In the literature it was tested that driver who has low safety skills, generally reports high perceptual-motor skills that turn to the highest levels of accidents and penalties which pointed out the importance of awareness and views of own driving skills (Özkan & Lajunen 2006; Özkan, Lajunen, Chliaoutakis, Parker, & Summala 2006; Sümer, Özkan, Lajunen, 2006). In addition to this relation, possible relationships were also tested between driver skills and driver behaviors. Supporting the literature, perceptual motor skills were positively associated with driver aggression, and similarly to both hostile aggressive behaviors subscale and aggressive violation subscale were marked as doing more by those who reported high perceptual motor skills (Lajunen, Parker, & Summala, 1998; Lajunen & Summala, 1995). Another finding in parallel with the literature was found between perceptual-motor skills, errors, and lapses, and those who reported high perceptual motor skills, similar to other studies (for example, the study of Xu et al. 2018), exhibited fewer errors and lapses in this study. Moreover, perceptual-motor skills were also found negatively related to accident-panic related concerns, social concerns, anxiety-based performance deficits, and exaggerated safety behaviors. Since the direct relationship between perceptual motor skills and driver concerns or anxious driver behaviors has always remained in theory and has never been measured, there are no supporting or opposing findings regarding these relationships. However, since accident and panic related thoughts, as well as social concerns, are often related to people's feelings of being out of control and inadequacy of skills or abilities, it is logical that the thoughts of being strong in one's perceptual-motor skills are both negatively related to these type of concerns (Taylor, Deane, & Podd, 2008). In addition, with the same logic, and because anxiety performance deficits are a little more related to errors and lapses on roads, and because exaggerated safety behaviors are used as a balance task in bad moments, findings are mainly in parallel with the literature as well (Clapp et al., 2011).

After perceptual-motor skills correlation analyses check, safety skills were also screened. The first relationship examination showed that safety skills were positively correlated with exaggerated safety behaviors. Before, this study, there was no study checking this relationship. On the other hand, with the content interpretation of these factors, some comments could be done with respect to the literature. Firstly, exaggerated safety behaviors cover some extreme safety applications and are related to travel avoidance (Clapp et al., 2011). On the other hand, the items were related to safe driving behaviors such as "I try to put distance between myself and other cars", "During bad weather, I drive more cautiously than other vehicles on the road" or "I slow down when approaching intersections even when the light is green". These items seem to be applications that allow people to travel safely. If it is taken into account that safety skills are affected by people's attitudes and personality factors and taken into account that people are skills that direct their ability to drive in a safe manner, it may not be surprising that there is a semantically positive relationship between safety skills and safety behaviors (Lajunen & Summala, 1995). Moreover, with the same idea that was written for perceptual-motor skills, safety skills were found negatively correlated with accident-panic related concerns, social concerns, and anxiety-based performance deficits. Since a person's ability and skills are high and self-confidence will reduce the feeling of being out of control, a negative relationship can be expected between them (Taylor, Deane, & Podd, 2008). Moreover, similar to the studies of Tekeş, Özdemir, and Özkan (2020), Üzümcüoğlu, Özkan, Wu and Zhang (2020), and Xu et al. (2018), safety skills were negatively related to lapses, errors, ordinary violations, and aggressive violations as well. Moreover, due to the content of aggressive violations and hostile aggressive behaviors contents are similar, safety skills were also found negatively related to hostile-aggressive behaviors.

The findings related to accident-panic related concerns and social concerns were also in the same line with the literature (such as the study of Taylor, Stephens, and Sullman, 2021), and both concerns and anxious driver behaviors were found as positively correlated with each other. Considering the instant thoughts and

concerns of all these subscales and the behaviors they implement to control these measures, the positive correlation between them supports the literature.

State anxiety and trait anxiety was found as negatively correlated with perceptual-motor skills and safety skills. In the literature, no study could be found that examines this relation directly. On the other hand, it has been reported that anxiety reduces driver performance regardless of whether the person has experience or inexperience (Gotardi et al., 2019). For this reason, it is not surprising to find such a relationship between DSI, which is one of the most common measurement tools in the field, and performance.

In the study of Pourabdian and Azmoon, the correlation analyses for trait anxiety and DBQ subscales showed that trait anxiety has a significant positive relationship with all DBQ subscales but the values were especially high for errors and lapses (2013). This finding has exactly the same results as the currently conducted study, so this relationship has been replicated once again with this study.

In this study, hostile behaviors and anxiety performance deficits were found as positively related to aberrant driver behaviors. The possible reason for this similarity could be related to the nature of the constructs and the contents of the scales were very similar for hostile aggressive behaviors and aggressive violations. Moreover, a positive link was found for anxiety-performance deficits, lapses, and errors as well. this result is not surprising as well. In the literature, it is stated that anxiety-related impairments are a byproduct of competing for cognitive demands (Taylor et al., 2008). In the same framework, if it is considered that errors arise from cognitive processing problems, we can also make sense of the relationship between these two (Reason et al., 1990). Therefore, at the end of this section, it should be noted that hostile aggressive behaviors acted similar to aggressive violations, and anxiety-based performance deficits acted similar to errors. However, more research could be done in order to replicate this information. Finally, as explained in the previous paragraphs, in this study, exaggerated safety behaviors gave results in the same direction as safety skills,

and exaggerated safety behaviors were negatively correlated with lapses, errors, and violations, as well as the safety skill, again supporting the previous relationships.

4.4. Discussion of Mediation Analysis and Model Test

First of all, it should be reported that the mediator variable tests gave similar results. No significant results were obtained for the violation factor of the DBQ. This was the case for its relationship with both perceptual-motor skills and safety skills. The results showed that mediator effects were significant for lapses, errors, and anxious driver behaviors as outcome behaviors. This result was something predictable from the beginning of the study and indirectly compatible with the literature. First of all, accidents, panic, or social concerns experienced in traffic can be evaluated as an indicator of driving anxiety in general (Ehlers et al., 2007). Furthermore, again, errors, lapses, or anxiety performance deficits generally do not contain a deliberate and intentional motivation that occurs due to the influence of unconscious cognitive processes (Clapp et al., 2011; Özkan & Lajunen, 2006). This situation is similar to general anxiety functioning, and for this reason, it is not surprising that the findings are in this direction, especially when there is a question mark in the minds of people about their skills and abilities (Shanar, 2009). In addition, it is known that those who think that young people have high self-confidence about their skills and abilities generally commit violations, but since the group investigated in this study is not overconfidents it may not be surprising to find no results on violations (Martinussen, Hakamies-Blomqvist, Moller, Özkan, & Lajunen, 2013).

After this general comment on the significant patterns of mediation analyses, more detailed discussion could be made on the detailed results. Firstly, research question 1 was tested for perceptual-motor skills and accident-panic related concerns. Accident-panic related concerns were tested as mediators of the possible relationships between perceptual-motor skills and driving behaviors. The results showed that accident-panic related concerns partially mediated the relationship

between perceptual motor skills and anxiety performance deficits and the relationship between perceptual motor skills and lapses. Moreover, the relationships between perceptual motor skills and exaggerated safety behaviors and between perceptual motor skills and errors were mediated by accident-panic related concerns separately. According to these findings, those who think that their perceptual-motor skills are good, report fewer accident panic related concerns which turn into fewer anxiety performance deficits, exaggerated safety behaviors, lapses, and errors. Secondly, research question 1 was tested for perceptual-motor skills and social concerns. The mediator effect of social concerns was screened and it is found that perceptual-motor skills were mediated by social concerns on the way to lapses partially and errors fully. Moreover, parallel mediation examinations were also performed and it was found the relationships between perceptual motor skills and anxiety performance deficits were mediated by accident panic related concerns and social concerns. In fact, this finding is in line with the findings described in the previous paragraph. Just as a person thinks that when he/she has low awareness when he/she is young and believes in his/her driving abilities, he/she thinks that he/she is more likely to be involved in an accident or to be able to control the situation (Martinussen et al., 2013). Otherwise, the other group will have a fear of having more accidents or what other people will think of me when their skills are bad, and this may increase the possibility of making mistakes (Ehlers et al., 2007; Shanar, 2009).

Safety skills were also screened with the same technique and research question 1 was tested for perceptual-motor skills and accident-panic related concerns. The relationships between safety skills and anxiety performance deficits, safety skills and lapses, and safety skills and errors were found as partially mediated by accident-panic related concerns. In addition to them, same results were found also for social concerns concerning research question 1 for safety skills partially. Furthermore, with a similar line, parallel mediation was found for accident panic related concerns and social concerns were found as parallel mediators for the relationship between safety skills and anxiety performance deficits. These findings show that safety skills were positively correlated with perceptual motor skills and

give results in this axis. As stated earlier in this study, contrary to the asymmetric relationship proposed in the literature (e.g. Sümer, Özkan, & Lajunen, 2006), these findings are not surprising, since perceptual-motor skills and safety skills work in the same way in this study. People who think that their safety skills are better, in general, have fewer thoughts that trigger driving anxiety and this has turned into less anxiety performance deficits, lapses, and errors.

The mediator effects of both state and trait anxiety were also tested in this study, on the other hand, no effect can be found for state anxiety concerning research question 2. The main reason why this relationship could not be found may be that the state anxiety measurement has not been fully provided for the driving environment. State anxiety could be defined as "a temporary experience of fear and arousal that is elicited from a real (e.g., a car careening toward you while crossing the street) or potential (e.g., concerns that you won't complete an assignment by the deadline) threatening situation" and it is an instantaneous mood measurement (Speilberger & Rickman, 1990). In this study, it is thought that this scale does not work for this study, since performing this measurement while driving will give more realistic results. However, the results obtained in state anxiety are not valid for trait anxiety sub-scale. Trait anxiety, the mediator effect which was examined, was found to be a mediator for various relationships, and these findings are consistent with both the literature and the previous mediation analysis. In the first trials conducted in this study for anxiety level, trait anxiety was primarily found to be a mediating variable between perceptual motor skills and lapses, and between perceptual motor skills and anxiety performance deficits, perceptual motor skills, and error. Among the two variables of research question 2, it was found that drivers who say that their perceptual motor skills are high exhibit less trait anxiety, which in turn turns into less anxiety performance deficits, lapses, and error.

Similar tests have also been conducted for other dependent variables, and research question 2 was also tested for trait anxiety and safety skills. It was found that safety skills play a mediator role with trait anxiety for hostile behaviors, as well as a

mediator variable for anxiety performance deficits lapses, and errors. In previous trait anxiety and DBQ studies, it was found that trait anxiety predicted all DBQ subscales. However, it was found to be more related to errors and lapses, as in this study. For this reason, it is logical in this model to test that trait anxiety, which by its very nature exhausts the working memory capacity of the person, is related to errors and lapses (Shahar, 2009). Skills and trait anxiety link, which is the other side of the relationship, can also be predicted with the general anxiety logic. Although not much relationship has been found between people's confidence in their own skills and trait anxiety, this may be the opposite for traffic in sports studies (Hanton, Evans, & Neil, 2001; Voight, Callaghan, & Ryska, 2000). This situation may be different on the roads we use every day, and it may cause more errors in the general population, as trait anxiety is triggered in the traffic by people who rely on their abilities, just like in elderly drivers (Azik, 2015; Taylor, 2018). However, since this and similar mediation analyzes and models have not been tested before and this is not a subject that has been researched much, these findings need to be replicated in order to fully understand them.

Apart from the serial mediation analyses, parallel mediator roles of driving-related concerns and anxiety were tested in skills and aberrant and anxious driving behaviors links as suggested in Research Question 1 and 2, but no significant model result could be found for Research Question 3. The most important reason for this may be that the state anxiety subscale could not be worked for this study sample and that the items trait anxiety substances fall by half. Potential problems with the measurement may have affected these model test results, especially as the relationship becomes more complex. In future studies, the development of the measures specific to anxious driving and repeating the study with different samples may help bring many previously unknown links to light.

4.5. Contributions and Practical Implications of the Findings

This study is the first to combine driver skills and driving behaviors in the context of anxious concerns and being anxious in traffic settings. The study makes a

difference with especially working with the general population instead of a limited sample and seeing that these models work actually emphasizes the place and importance of anxiety in traffic conditions. In addition, according to the results, errors and lapses rather than violations were included into the significant mediation analyses results. Errors and lapses as being two sub group of aberrant behaviors have not been perceived as dangerous as violations concerning traffic safety. It is mentioned that People who have just gotten used to road traffic, who have somehow experienced or some impairment caused by an illness or age, or who just have complicated or stressful life for the moment, and as a result of their daily worries, can also make errors and lapses. Although significant results seem to have been found for trait anxiety, there are some critical points that should be noted in this study. First of all, although it is said that trait anxiety measurement is made here, when the measurement tool items are focused on, the measurement used in this study is within the framework of feeling anxious rather than a personality trait. In other words, it may be more accurate to interpret it as how much anxiety feeling people experience constantly (trait items) or situationally (state items). The definition of "arousal vulnerability" would be more appropriate for the line measurement framework. For this reason, it should be noted that trait anxiety, which has been done here and has its consequences, should be interpreted as the experiences of people's feelings in general.

Cognition measurements or anxiety driving measurements used in this study were mostly used for clinical groups in the previous studies. However, in this study, it is revealed how much these variables are related to the general population, how common they are, and how much they affect the judgments and driving behaviors related to driving skills, which we call main driver actions. As a result of this study, 2 new scales (DCQ & DBS) were translated to Turkish, while one scale (STAI) will be re-examined and updated. And in this way, a step of research on how this issue can change in cross-cultural terms has been completed.

In addition, in this study, for the first time, anxious driving behavirs (DBS) and Aberrant driving behaviors (DBQ) were added to a single study and the results and

model were evaluated within this framework. When considered in the results, the fact that these risky behavior measurement tools, which were originally developed for different concepts, draw interrelated and relevant results and support each other, reveals the power and validity of these developed instruments. For this reason, the results of this study also reveal the power of the measurement tools used in the field.

This study can be seen as combining the piecemeal information found in the literature for traffic safety and evaluating it in a relationship cycle. We have had the opportunity to test some variables that we know or assume to be related to each other on the basis of the general population. In this context, it is important that traffic safety that anxiety and driving anxiety, whose significance is not clear since no model or research has been carried out in this context before. Therefore, with the help of this current study anxiety while driving could be more understood by society and by policymakers and educators in order to enhance mobility of both the driver avoidant groups and the groups with more driving errors and lapses. Furthermore, the first pillar of interventions based on understanding and comforting drivers, such as new drivers, women who are discriminated against, or other drivers who have a decrease in their abilities for some reason, can be provided by these study findings. In general, it is always necessary to provide a good and safe environment for the risky group, but from time to time, it is necessary to provide a benefit to the safer driver groups. This purpose has been served in this study.

4.6. Critical Remarks of the Study and Suggestions for Future Research

The current study has some critical issues to discuss. The first and fundamental thing to mention is that the data of this study started to be collected at the beginning of the Covid 19 pandemic. It is known that the Covid 19 pandemic caused a large-scale lock-down between 2020-2022, and an increase in general anxiety, especially because people do not know how the disease will progress (Kan et. al, 2021). In addition, people cannot be very active in the traffic environment due to

staying at home during this process that would affect their responses to driving actions. Some studies have revealed increases in the amounts and frequencies of some behaviors such as speeding, phone usage, or more severe violations when they are on the road during Covid-19 Pandemic (Katrakazas, Michelaraki, Sekadakis, & Yannis, 2020). Undoubtedly, the collection of data at the beginning of the pandemic yielded better results than the collection towards the end. However, considering the fact that the main variables of this study are related to the traffic environment and general public anxiety, it would be appropriate to make measurements again when the effects of disease decrease after a while and compare these results in terms of other literature findings.

The second critical issue may be gender and age. Although neither correlation nor main analysis found significant relationships with gender and age were taken into account as control variables for this study. It has been reported that age and gender differences are closely related to both driver skills, driver behaviors, and anxiety-related variables in some other studies. For example, it is known that as age increases, anxiety and anxiety-related symptoms and behaviors tend to decrease (Mahoney, Segal, & Cooligde, 2015). On the other hand, in gender studies, the results are a bit more mixed. For example, in the study of Tan, Ma, Gao; Wu, and Fang (2011), it was emphasized that these findings about women may actually be due to the data collection features of the studies or the over-participation of some subgroups and that this anxiety situation may not be a feature dominated by women. For this reason, studies with different samples and comparative analyzes should be conducted on both gender and age.

Finally, although DSI, DBQ, DCQ, and DBS are included in the study as self-report measurement tools and give strong and literature-supported results, and the findings are interpreted within the framework of the self-report instrument, there are some inconsistencies and question marks in the State and Trait Anxiety measurement. First of all, when state anxiety was measured, the main point of this study was taken into account as state anxiety while driving. However, it could not be measured at the desired point because people filled this measurement tool at

home or work environment and were not actively involved in the traffic environment at that moment. Conducting different studies with this measurement tool for state anxiety, in a simulator or real driving situation will give the opportunity to test the measure in combination with different measures. Moreover, too many dropped items were in Trait Subscale that could be pointed out as well. The reason of these drops could be related to sample characteristics. For this reason, in future studies, different measurement tools could be used, specifically developed or people should be exposed to the traffic environment during data collection process in some way.

4.7. Conclusion

As driving anxiety or anxiety does not actually cover a dominant place in the literature such as aggression or anger, this study is a pioneering study in which individual literature findings related to driving skills, driving behaviors, driving, and general anxiety to date have been gathered, tested, and proven to be functional for the general driver population. Anxiety is a situation that everyone experiences daily and from time to time, and it is impossible to think that it is not reflected in the traffic environment, which is a daily activity and is stressful by nature. With the results of this study, it has been seen that people who have negative thoughts about their own skills may experience more driving anxiety or their evaluation could trigger their general anxiety which could turn in more errors, more lapses while driving.

As a result of the present study, it has been shown that anxious concerns, daily anxiety and driving anxiety, which can be considered at first glance as very dominant mood or permanent personality characteristics, are more acceptable to the general driver population and valid for everyone. Considering that women drivers who think about having low skills and who have more anxiety or elderly drivers who can still drive safely, a driver with daily stress or job stress might be the example of the group of drivers that could get benefit from this study's findings. It is known that this group of drivers could carefully evaluate their skills

instead of thinking that their skills are very high and engaging less violations. This study finding suggests that, if this type of driver can control their anxiety or make their cognitions about the traffic environment more constructive, they can reduce their driving deficits, errors, and lapses rates that could make them much safer drivers. In this way, similar to the research that generally focuses on risky drivers and tries to provide a safe environment with them, studying anxious drivers with errors and lapses will also contribute to an environment where safe people will be in more traffic.

This study provided the literature with a meaningful base for understanding the nature of anxiety in traffic safety. Future studies would investigate this variable in more detail and in combination with some other variables in the way to make traffic settings safer.

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APPENDICES

A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

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16 MART 2020

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Doç.Dr. Bahar ÖZ

Danışmanlığını yaptığınız **Derya Azık ÖZKAN'ın "Trafik Ortamlarında Kaygı ve Araç Kullanımı"** başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve **091 ODTU 2020** protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

Prof.Dr. Mine MISIRLISOY
Başkan

Prof. Dr. Tolga CAN
Üye

Doç.Dr. Pınar KAYGAN
Üye

Dr. Öğr. Üyesi Ali Emre TURGUT
Üye

Dr. Öğr. Üyesi Şerife SEVİNÇ
Üye

Dr. Öğr. Üyesi Müge GÜNDÜZ
Üye

Dr. Öğr. Üyesi Süreyya Özcan KABASAKAL
Üye

B. INFORMED CONSENT

Bu araştırma ODTÜ Psikoloji Bölümü doktora öğrencisi **Uzm. Psk. Derya Azık Özkan** tarafından doktora tezi kapsamında **Doç. Dr. Bahar ÖZ** danışmanlığında yürütülmektedir. Çalışmanın amacı, uygulanan ölçüm araçları vasıtası ile trafik ortamlarında ve sürüş esnasında deneyimlenen kaygı ve bu kaygının trafik güvenliği açısından olası etkilerinin kapsamlı olarak araştırılmasıdır. Çalışmada, kimlik belirleyici hiçbir bilgi istenmemektedir. Anket sonuçları gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir; elde edilecek bilgiler sadece bilimsel yayımlarda kullanılacaktır.

Çalışma genel olarak kişisel rahatsızlık verecek bir etkileşim içermemektedir. Ancak, katılım sırasında her hangi bir nedenden ötürü kendinizi rahatsız hissederseniz çalışmayı bırakmakta serbestsiniz. Çalışmanın sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz.

Çalışma hakkında daha fazla bilgi almak için Psikoloji Bölümü araştırma görevlilerinden **Uzm. Psk. Derya Azık Özkan** (E-posta: derya.azik@metu.edu.tr) veya öğretim üyelerinden **Doç Dr. Bahar Öz** (E-posta:ozbahar@metu.edu.tr) ile iletişim kurabilirsiniz.

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip çıkabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayımlarda kullanılmasını

☐ Kabul ediyorum.
☐ Kabul etmiyorum.

C. DEMOGRAPHIC INFORMATION FORM

DEMOGRAFİK BİLGİ FORMU

1. Yaşınız:_____ 2. Cinsiyetiniz: □ Kadın □ Erkek 3. Mesleğiniz:_____
4. Eğitim durumunuz:_____ 5. Ne kadar süredir ehliyet sahibisiniz? _____ Yıl
6. Geçen yıl yaklaşık olarak toplam kaç km araç kullandınız? ____ kilometre
8. Ne kadar sıklıkla aşağıda belirtilen durumlarda araç kullandığınızı ilgili rakamı işaretleyerek belirtiniz?

	Hergün	Haftada bir kez	Ayda iki kez	Ayda bir kez	6 ayda bir kez	Hiç
Kış aylarında	1	2	3	4	5	6
6Yoğun araç trafiğinde	1	2	3	4	5	6
Otobanda	1	2	3	4	5	6
Diğer ana yollarda	1	2	3	4	5	6
Şehiriçi yollarda	1	2	3	4	5	6
Şehirlerarası yollarda	1	2	3	4	5	6
Genellikle her durumda	1	2	3	4	5	6

9. Son üç yıl içerisinde küçük ya da büyüklüğüne bakmazsızın, nedeni ne olursa olsun, başınızdan geçen kaza sayısı kaçtır? _____

Bu kazaların kaç tanesinde hatalı taraftınız? _____

Bu kazaların kaç tanesi aktif (sizin bir araca yayaya veya nesneye çarptığınız kazalar) kaza idi?_____

Bu kazaların kaç tanesi yaralanma veya can kaybıyla sonuçlandı? _____

10. Son üç yıl içerisinde, aşağıda belirtilen trafik cezalarını kaç kere aldığınızı belirtiniz.

a) Yanlış park etme_____ b) Hatalı sollama_____ c) Aşırı hız_____
d) Kırmızı ışıkta geçme_____ e) Diğer (eksik ekipman, kırık far vb.)_____

11. Hava ve yol koşulları uygun olduğunda şehirlerarası yollarda yaklaşık ortalama kaç kilometre hızla gidersiniz?_____ km/saat

12. Hava ve yol koşulları uygun olduğunda şehir içi yollarda yaklaşık ortalama kaç kilometre hızla gidersiniz?_____ km/saat

13. Normal bir seyahatinizde kendinizi diğer sürücülerle kıyasladığınızda yaptığınız

sollamaların sayısı sollandığınıza oranla nedir?

Yaptığım sollamaların sayısı sollandığımdan azdır. □

Yaptığım sollamaların sayısı sollanmalarımla hemen hemen eşittir. □

Yaptığım sollamaların sayısı sollanmalarımdan fazladır. □

D. DRIVER SKILL INVENTORY

SÜRÜCÜ BECERİLERİ ÖLÇEĞİ

Yönerge:
Araç kullanırken güçlü ve zayıf yönleriniz nelerdir? Özellikle araç kullanmanın farklı yönlerinde sürücüler arasında pek çok farklılıklar vardır. Hepimizin güçlü vezayıf yönleri vardır. Lütfen, sizinbir sürücü olarakgüçlü ve zayıf yönlerinizi size göre doğru olan seçeneği karalayarak belirtiniz. Her bir soru için cevap seçenekleri şu şekildedir:

1= ÇOK ZAYIF, 2= ZAYIF, 3= NE ZAYIF NE DE GÜÇLÜ, 4= GÜÇLÜ, 5= ÇOK GÜÇLÜ

		ÇOK ZAYIF	ZAYIF	NE ZAYIF NE DE GÜÇLÜ	GÜÇLÜ	ÇOK GÜÇLÜ
1	Seri araç kullanma	1	2	3	4	5
2	Trafikte tehlikeleri görme	1	2	3	4	5
3	Sabırsızlanmadan yavaş bir aracın arkasından sürme	1	2	3	4	5
4	Kaygan yolda araç kullanma	1	2	3	4	5
5	İlerideki trafik durumlarını önceden kestirme	1	2	3	4	5
6	Belirli trafik ortamlarında nasıl hareket edileceğini bilme	1	2	3	4	5
7	Yoğun trafikte sürekli şerit değiştirme	1	2	3	4	5
8	Hızlı karar alma	1	2	3	4	5
9	Sinir bozucu durumlarda sakin davranma	1	2	3	4	5
10	Aracı kontrol etme	1	2	3	4	5
11	Yeterli takip mesafesi bırakma	1	2	3	4	5
12	Koşullara göre hızı ayarlama	1	2	3	4	5
13	Geriye kaçırmadan aracı yokuşta kaldırma	1	2	3	4	5
14	Sollama	1	2	3	4	5
15	Gerektiğinde kazadan kaçınmak için yol hakkından vazgeçme	1	2	3	4	5
16	Yoğun trafikte sürekli şerit değiştirme	1	2	3	4	5
17	Gereksiz risklerden kaçınma	1	2	3	4	5
18	Diğer sürücülerin hatalarını telafi edebilme	1	2	3	4	5
19	Trafik ışıklarına dikkatle uyma	1	2	3	4	5
20	Dar bir yere geri geri park edebilme	1	2	3	4	5

E. DRIVING COGNITION QUESTIONNAIRE

SÜRÜCÜLÜKTE BİLİŞSEL YARGILAR ANKETİ

Yönerge:
Aşağıda araç kullanma sırasında aklınızdan geçebilecek bazı düşünceler ve fikirler sıralanmıştır. Lütfen aşağıdaki düşüncelerin araç kullanırken aklınızdan ne sıklıkta geçtiğini uygun olan seçeneği karalayarak belirtiniz. Her bir soru için cevap seçenekleri şu şekildedir:

0= Bu düşünce aklımdan hiç geçmedi
1= Bu düşünce aklımdan çok nadir geçiyor
2= Bu düşünce araç kullandığım zamanların yarısında aklımdan geçiyor
3=Bu düşünce genellikle aklımdan geçiyor
4= Bu düşünce araç kullandığım her an aklımdan geçer

		ASLA	NADİR	YARI ZAMANLI	GENELLİKLE	HER ZAMAN
1	Yeterince hızlı tepki veremeyeceğim	0	1	2	3	4
2	Önemsediğim insanların beni eleştireceği	0	1	2	3	4
3	Düzenli nefes alıp vermeye devam edemeyeceğim	0	1	2	3	4
4	Diğer araçların bana çarpıp çarpmayacağını kontrol edemeyeceğim	0	1	2	3	4
5	Diğer insanların endişeli olduğumu fark edecekleri	0	1	2	3	4
6	Titremem yüzünden direksiyonu kontrol edemeyeceğim	0	1	2	3	4
7	Yaralanacağım	0	1	2	3	4
8	İnsanların kötü bir sürücü olduğumu düşüneceği	0	1	2	3	4
9	Birini yaralayacağım	0	1	2	3	4
10	Net bir şekilde düşünemeyeceğim	0	1	2	3	4
11	Bir kazada öleceğim	0	1	2	3	4
12	Trafikte sıkışıp kalacağım	0	1	2	3	4
13	Bir kazaya sebep olacağım	0	1	2	3	4
14	Trafikte mahsur kalacağım	0	1	2	3	4
15	Trafiği aksatacağım ve bu yüzden insanların bana kızacağı	0	1	2	3	4
16	Kalbimin duracağı	0	1	2	3	4
17	İnsanların bana güleceği	0	1	2	3	4
18	Hareket edemeyeceğim	0	1	2	3	4
19	Benimle seyahat eden kişilerin zarar göreceği	0	1	2	3	4
20	Kontrolümü kaybedeğim ve aptalca ya da tehlikeli bir şekilde davranacağım	0	1	2	3	4

F. DRIVING BEHAVIOR SURVEY

SÜRÜCÜ DAVRANIŞLARI ÖLÇEĞİ

Yönerge:

Trafik ortamında insanın gergin hissetmesine neden olan bazı durumlar söz konusudur (örneğin; hava koşulları, trafik sıkışıklığı, ramak kala kazalar v.b.) Aşağıda bu gibi durumlar ile ilgili olabilecek ya da olamayacak bazı davranışların listesi verilmiştir. Lütfen kişisel deneyimlerinize dayanarak, endişeli, gergin veya stresli bir sürüş ortamında aşağıda sıralananlar davranışları ne sıklıkta gerçekleştirdiğinizi belirtiniz. Doğru ve ya yanlış cevap yoktur sadece genel olarak ne yaptığınızı belirtmeniz istenmektedir. Her bir soru için cevap seçenekleri şu şekilde puanlanmaktadır:

2 3 4 5 6

		ASLA	ÇOK NADİREN	NADİREN	BAZEN	SIKÇA	ÇOK SIK	HER ZAMAN
1	Nereye gittiğimi hatırlamadığım anlar oluyor.	1	2	3	4	5	6	7
2	Beni sinirlendiren sürücü/sürücülere bağırıyorum	1	2	3	4	5	6	7
3	Kavşaklara yaklaşırken, ışık yeşil olsa bile yavaşlıyorum	1	2	3	4	5	6	7
4	Doğru şeritte kalmakta zorlanıyorum	1	2	3	4	5	6	7
5	Diğer şeritlere kayıyorum	1	2	3	4	5	6	7
6	Hızda uygun ayarlamaları yapmayı unutuyorum	1	2	3	4	5	6	7
7	Beni tedirgin eden sürücünün üzgün olduğumu bilmesine izin veriyorum	1	2	3	4	5	6	7
8	Önümdeki sürücü ile arama geniş bir takip mesafesi bırakıyorum	1	2	3	4	5	6	7
9	Araç kullanırken nereye gidiyor olduğumu unutuyorum.	1	2	3	4	5	6	7
10	Beni sinirlendiren sürücü/sürücülere el/kol/baş hareketleri yapıyorum	1	2	3	4	5	6	7
11	Kendi aracım ve diğer araçlar arasına mesafe koymaya çalışıyorum	1	2	3	4	5	6	7
12	Kendimi sakinleştirmek amacıyla hızımı sabitliyorum	1	2	3	4	5	6	7

		ASLA	ÇOK NADİREN	NADİREN	BAZEN	SIKÇA	ÇOK SIK	HER ZAMAN
13	Diğer arabalardan uzak durmaya çalışıyorum	1	2	3	4	5	6	7
14	Doğru şeridi bulmakta zorluk çekiyorum	1	2	3	4	5	6	7
15	Gergin olduğumda direksiyona vuruyorum	1	2	3	4	5	6	7
16	Kendimi rahat hissedene kadar hızımı azaltıyorum	1	2	3	4	5	6	7
17	Beni sinirlendiren, geren sürücülere korna çalıyorum	1	2	3	4	5	6	7
18	Diğer sürücülere beni sinirlendirdiklerini belli etmenin yollarını bulmaya çalışıyorum.	1	2	3	4	5	6	7
19	Kötü havalarda, yoldaki diğer taşıtlardan daha dikkatli araç kullanıyorum	1	2	3	4	5	6	7
20	Araba kullanırken küfür ediyorum	1	2	3	4	5	6	7
21	Trafiğe karışmakta zorlanıyorum	1	2	3	4	5	6	7

G. DRIVER BEHAVIORS QUESTİONNAIRE

SÜRÜCÜ DAVRANIŞLARI ANKETİ

Yönerge:

Aşağıda verilen durumları ne sıklıkta yaparsınız ?

Lütfen her bir madde için verilen durumun ne sıklıkta başınızdan geçtiğini belirtiniz. Soruları, nasıl araç kullandığınızı düşünerek cevaplandırınız ve her bir soru için sizi tam olarak yansıtan cevabı, yanındaki kutudaki uygun rakamı daire içine alarak belirtiniz.
0= HİÇ BİR ZAMAN, 1= NADİREN, 2= BAZEN, 3= OLDUKÇA SIK, 4= SIK SIK,
5= HER ZAMAN

		Hiçbir zaman	**Nadiren**	**Bazen**	**Oldukça sık**	**Sık sık**	**Her zaman**
1	Geri geri giderken önceden fark etmediğiniz birşeye çarpmak	0	1	2	3	4	5
2	Trafikte, diğer sürücülere engel teşkil etmemeye gayret göstermek	0	1	2	3	4	5
3	A yönüne gitmek amacıyla yola çıkmışken kendinizi daha alışkın olduğunuz B yönüne doğru araç kullanırken bulmak	0	1	2	3	4	5
4	Geçiş hakkı sizde dahi olsa diğer sürücülere yol vermek	0	1	2	3	4	5
5	Yasal alkol sınırlarının üzerinde alkollü olduğunuzdan şüphelenseniz de araç kullanmak	0	1	2	3	4	5
6	Aracınızı kullanırken yol kenarında birikmiş suyu ve benzeri maddeleri yayaların üzerine sıçratmamaya dikkat etmek	0	1	2	3	4	5
7	Dönel kavşakta dönüş istikametinize uygun olmayan şeridi kullanmak	0	1	2	3	4	5
8	Anayoldan sola dönmek için kuyrukta beklerken, anayol trafiğine dikkat etmekten neredeyse öndeki araca çarpacak duruma gelmek	0	1	2	3	4	5
9	Trafikte, herhangi bir sürücü size yol verdiğinde veya anlayış gösterdiğinde, elinizi sallayarak, korna çalarak vb. şekilde teşekkür etmek	0	1	2	3	4	5
10	Anayoldan bir sokağa dönerken karşıdan karşıya geçen yayaları fark edememek	0	1	2	3	4	5

		Hiçbir zaman	**Nadiren**	**Bazen**	**Oldukça sık**	**Sık sık**	**Her zaman**
11	Başka bir sürücüye kızgınlığı belirtmek için korna çalmak	0	1	2	3	4	5
12	Karşıdan gelen araç sürücüsünün görüş mesafesini koruyabilmesi için uzunları mümkün olduğunca az kullanmak	0	1	2	3	4	5
13	Bir aracı sollarken ya da şerit değiştirirken dikiz aynasından yolu kontrol etmemek	0	1	2	3	4	5
14	Kaygan bir yolda ani fren veya patinaj yapmak	0	1	2	3	4	5
15	Arkanızdan hızla gelen aracın yolunu kesmemek için sollamadan vazgeçip eski yerinize dönmek	0	1	2	3	4	5
16	Kavşağa çok hızlı girip geçiş üstünlüğü olan aracı durmak zorunda bırakmak	0	1	2	3	4	5
17	Şehir içi yollarda hız sınırını aşmak	0	1	2	3	4	5
18	Önünüzdeki aracın sürücüsünü, onu rahatsız etmeyecek bir mesafede takip etmek	0	1	2	3	4	5
19	Sinyali kullanmayı niyet ederken silecekleri çalıştırmak	0	1	2	3	4	5
20	Sağa dönerken yanınızdan geçen bir bisiklet ya da araca neredeyse çarpmak	0	1	2	3	4	5
21	"Yol ver" işaretini kaçırıp, geçiş hakkı olan araçlarla çarpışacak duruma gelmek	0	1	2	3	4	5
22	Yeşil ışık yandığı halde hareket etmekte geciken öndeki araç sürücüsünü korna çalarak rahatsız etmemek	0	1	2	3	4	5
23	Trafik ışıklarında üçüncü vitesle kalkış yapmaya çalışmak	0	1	2	3	4	5
24	Yayaların karşıdan karşıya geçebilmeleri için geçiş hakkı sizde dahi olsa durarak yol vermek	0	1	2	3	4	5
25	Sola dönüş sinyali veren bir aracın sinyalini fark etmeyip onu sollamaya çalışmak	0	1	2	3	4	5
26	Trafikte sinirlendiğiniz bir sürücüyü takip edip ona haddini bildirmeye çalışmak	0	1	2	3	4	5
27	Arkanızdaki aracın ileriyi iyi göremediği durumlarda sinyal vb. ile işaret vererek sollamanın uygun olduğunu belirtmek	0	1	2	3	4	5
28	Otoyolda ileride kapanacak bir şeritte son ana kadar ilerlemek	0	1	2	3	4	5
29	Sollama yapan sürücüye kolaylık olması için hızınızı onun geçiş hızına göre ayarlamak	0	1	2	3	4	5
30	Aracınızı park alanında nereye bıraktığınızı unutmak	0	1	2	3	4	5
31	Solda yavaş giden bir aracın sağından geçmek	0	1	2	3	4	5
32	Trafik ışığında en hızlı hareket eden araç olmak için yandaki araçlarla yarışmak	0	1	2	3	4	5
33	Trafik işaretlerini yanlış anlamak ve kavşakta yanlış yöne dönmek	0	1	2	3	4	5
34	Acil bir durumda duramayacak kadar, öndeki aracı yakın takip etmek	0	1	2	3	4	5

		Hiçbir zaman	Nadiren	Bazen	Oldukça sık	Sık sık	Her zaman
35	Trafik ışıkları sizin yönünüze kırmızıya döndüğü halde kavşaktan geçmek	0	1	2	3	4	5
36	Otobanda trafik akışını sağlayabilmek için en sol şeridi gereksiz yere kullanmaktan kaçınmak	0	1	2	3	4	5
37	Bazı tip sürücülere kızgın olmak (illet olmak) ve bu kızgınlığı bir şekilde onlara göstermek	0	1	2	3	4	5
38	Seyahat etmekte olduğunuz yolu tam olarak hatırlamadığınızı fark etmek	0	1	2	3	4	5
39	Sollama yaparken karşıdan gelen aracın hızını olduğundan daha yavaş tahmin etmek	0	1	2	3	4	5
40	Gereksiz yere gürültü yapmamak için kornayı kullanmaktan kaçınmak	0	1	2	3	4	5
41	Otobanda hız limitlerini dikkate almamak	0	1	2	3	4	5
42	Aracınızı park ederken diğer yol kullanıcılarının (yayalar, sürücler vb.) hareketlerini sınırlamamaya özen göstermek	0	1	2	3	4	5

H. STATE TRAIT ANXIETY INVENTORY

DURUMLUK VE SÜREKLİ KAYGI ENVANTERİ

Yönerge:
Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da ***şu anda*** bu yargıyı ne ölçüde hissettiğinizi işaretleyiniz. Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde çok fazla zaman sarfetmeksizin hızlıca ***şu anda*** nasıl hissettiğinizi gösteren seçeneği işaretleyiniz.

1= HİÇ, 2= BİRAZ, 3= ÇOK, 4= TAMAMEN

	ŞU ANDA,	**HİÇ**	**BİRAZ**	**ÇOK**	**TAMAMEN**
1	Sakin hissediyorum.	1	2	3	4
2	Kendimi güvende hissediyorum.	1	2	3	4
3	Gerginim.	1	2	3	4
4	Kasılmış hissediyorum.	1	2	3	4
5	Ferahlık içindeyim.	1	2	3	4
6	Keyifsizim.	1	2	3	4
7	Olası talihsizlikler için endişeleniyorum.	1	2	3	4
8	Hoşnut hissediyorum.	1	2	3	4
9	Korkuyorum.	1	2	3	4
10	Kendimi rahat hissediyorum.	1	2	3	4
11	Kendime güveniyorum.	1	2	3	4
12	Şu anda asabım bozuk.	1	2	3	4
13	Sinirlerim tepemde.	1	2	3	4
14	Kendimi kararsız hissediyorum.	1	2	3	4
15	Kendimi rahatlamış hissediyorum.	1	2	3	4
16	Halimden memnunum.	1	2	3	4
17	Endişeliyim.	1	2	3	4
18	Aklım biraz karışık.	1	2	3	4
19	Kendimi tutarlı hisediyorum.	1	2	3	4
20	Şu anda keyfim yerinde.	1	2	3	4

Yönerge:
Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da ***genelde*** bu yargıyı ne ölçüde hissettiğinizi işaretleyiniz. Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde çok fazla zaman sarfetmeksizin hızlıca ***genelde*** nasıl hissettiğinizi gösteren seçeneği işaretleyiniz.

1= HEMEN HEMEN HİÇBİR ZAMAN, 2= BAZEN, 3= ÇOĞU ZAMAN, 4= HEMEN HEMEN HER ZAMAN

	GENELLİKLE,	**HEMEN HEMEN HİÇBİR ZAMAN**	**BAZEN**	**ÇOĞU ZAMAN**	**HEMEN HEMEN HER ZAMAN**
21	Keyfim yerindedir.	1	2	3	4
22	Kendimi gergin ve huzursuz hissederim.	1	2	3	4
23	Halimden memnunum.	1	2	3	4
24	Diğer insanlar kadar mutlu olmak isterim.	1	2	3	4
25	Kendimi bir başarısızlık örneği olarak görüyorum.	1	2	3	4
26	Kendimi dinlenmiş hissederim.	1	2	3	4
27	Kendimi sakin ve kendine hakim hissederim.	1	2	3	4
28	Zorlukların üstesinden gelemeyeceğim kadar biriktiğini hissederim.	1	2	3	4
29	Değmeyecek şeyler hakkında gereğinden fazla endişelerinirim.	1	2	3	4
30	Mutluyum.	1	2	3	4
31	Rahatsız edici düşüncelere sahibimdir.	1	2	3	4
32	Öz güven eksikliğim vardır	1	2	3	4
33	Genellikle kendimi güvende hissederim.	1	2	3	4
34	Kolay karar veririm.	1	2	3	4
35	Yetersiz hissederim.	1	2	3	4
36	Hayatımdan memnunum.	1	2	3	4
37	Olur olmaz düşünceler kafamı kurcalar ve bu beni rahatsız eder.	1	2	3	4
38	Hayal kırıklıklarımı öylesine ciddiye alırım ki aklımdan çıkaramam.	1	2	3	4
39	İstikrarlı bir insanım.	1	2	3	4
40	Son zamanlarda üzerinde düşündüğüm konular gerginlik ve karışıklık hissetmeme sebep oluyor.	1	2	3	4

I. CURRICULUM VITAE

Derya Azık Özkan

Thesis

M.Sc. Thesis:

Self-Regulatory Driving Practices of Old and Young Drivers - 2015/METU

Supervisor: Prof. Dr. Türker ÖZKAN

Ph.D. Thesis:

The Mediating Role of Driving Related Cognitions and Anxiety in the Relationship between Driving Skills and Driving Behaviours - 2022/METU

Supervisor: Assoc. Prof. Dr. Bahar Öz

Education

September 2015 - August 2022

Ph.D. Degree -Middle East Technical University, Department of Psychology

GPA: 4,00

September 2012 - June 2015

M. Sc. Degree - Middle East Technical University, Department of Psychology GPA: 3,76

January 2011 - July 2011

Erasmus Exchange Programme - Tilburg University, Department of Psychology.

September 2007 - June 2012

Bachelor's Degree. - Middle East Technical University, Department of Psychology GPA: 3,66

Work Experience

2016 – 2022 **Middle East Technical University, Department of Psychology**, Research Assistant

2015 – 2016 **On Dokuz Mayıs University (Samsun, Turkey), Department of Psychology**, Research Assistant

Projects

2015-2018: **As a Researcher**:

Traffic Safety Cultures and the Safe Systems Approach – Towards a Cultural Change Research and Innovation Agenda for Road Safety (**TraSaCu**), **European Union Horizon 2020** research and innovation program under the Marie Skłodowska Curie grant agreement No 645690.

Certifications & Awards

2015-2019: TÜBİTAK BİDEB (The Scientific and Technological Research Council of Turkey)- Direct National Ph.D. Scholarship

2012-2015: TÜBİTAK BİDEB (The Scientific and Technological Research Council of Turkey)- Direct National M.Sc. Scholarship

2011: Social Psychology Certificate, Social Sciences Faculty, Tilburg University

2011: Research Assistantship Certificate, Social Sciences Faculty, Tilburg University

2007-2012: TÜBİTAK BİDEB (The Scientific and Technological Research Council of Turkey)- Undergraduate Program Scholarship

Publications

Fındık, G. Solmazer, G.,..., **Azık, D**., et al., (2022). A comparison of the relationship between individual values and aggressive driving in five countries. Journal of Transportation Safety and Security,14()3, 430-452.DOI: 10.1080/19439962.2020.1784341

Azık, D., Solmazer, G., et al., (2021). Road users' evaluations and perceptions of road infrastructure, trip characteristics, and daily trip experiences across countries, Transportation Research Interdisciplinary Perspectives, 11, 100412. DOI: 0.1016/j.trip.2021.100412

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and Driver Skills. Journal of Traffic and Transportation Research, 3 (2), 133-144.

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Solmazer, G., **Azık, D.**, et al., (2020). Cross-cultural differences in pedestrian behaviors in relation to values: A comparison of five countries. Accident Analysis and Prevention, 138, 105459.

Ersan, Ö., Üzümcüoğlu, Y., **Azık, D.**, et al., (2020). Cross-cultural differences in driver aggression, aberrant, and positive driver behaviors. Transportation Research Part F, 71, 88-97.

Ersan, Ö., Üzümcüoğlu, Y., **Azık, D.,** et al., (2019). The Relationship Between Self and Other in Aggressive Driving and Driver Behaviors Across Countries. Transportation Research Part F, 66, 122-138.

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Azık, D. & Özkan, T . (2018). Tactical and Strategical Distribution of Driving Self-Regulatory Behaviors for Old and Young Drivers in Turkey Journal of Traffic and Transportation Research, 1 (1), 14-35.

Azık., D., Ersan, Ö., Fındık, G., Kaçan, B., et al. (2018). Draft of Change - Management Strategy (Deliverable 4.2) for Traffic Safety Cultures and the Safe Systems Approach Towards a Cultural Change Research and Innovation Agenda for Road Safety (TraSaCu) Project.

Azık., D., Ersan, Ö., Findik, G., Kaçan, B., et al. (2018) Model of traffic cultures and impact (Deliverable 4.1) for Traffic Safety Cultures and the Safe Systems Approach Towards a Cultural Change Research and Innovation Agenda for Road Safety (TraSaCu) Project, 1-228.

Özkan, T., Üzümcüoğlu, Y.,. . . **Azık, D**.,. . . Erkuş, U. U. (2016). Türkiye Analizi: Takip Çalışması Sürücü ve Ön Koltuk Yolcularının Emniyet Kemeri Kullanımı.Emniyet Genel Müdürlüğü. http://www.trafik.gov.tr/SiteAssets/Yayinlar/Kitaplar/Emniyet_Kemeri_2016.pdf (289 p.)

Azık, D. & Biçer, D. Ö. (2014). Emniyet Kemeri Kullanımı ve Hızarasındaki iki yönlü ilişki: Orta Doğu Teknik Üniversitesi'inde birgözlemsel çalışma. Durna, T., Tosun, H., Yüksel, Y., Demirkol, İ. C. (Eds.),5th Road Traffic Safety Symposium and Exhibition. (pp. 119-130). İklimYayınları.

Accepted Studies

Salduz, M., **Azık,** D., & Öz, B. (Accepted). Investigating Professional and Unprofessional Drivers Skills, Safety Concerns and Risk-Taking Behaviors: An Assessment on each Group's Perception of the Other, Uludağ Üniversitesi Fen- Edebiyat Fakültesi Sosyal Bilimler Dergisi.

Özkan, B., & **Azık,** D. (Accepted). The role of Sex in Evaluating Male and Female Drivers' own Skills and Behaviors in Traffic. Trafik ve Ulaşım Araştırmaları Dergisi.

Presentations & Current Studies

Oral Presentations:

Azık, D. (May, 2022). Trafik Güvenliği ve İnsan. 2. Trafik Güvenliği Çalıştayı – Trafik Güvenliğinde İnsan Faktörü. Trafik Enstitüsü, Polis Akademisi Ankara, Turkey.

Okçuer, N. & **Azık, D**. (2021, July). Covid-19 effects on anxiety and stress. 32nd InternationalCongress of Psychology, Prague, Czech Republic.

Salduz, M., **Azık, D.** & Öz B. (2021, July). Perceptions of professional drivers and unprofessional drivers about each other in traffic. 32nd International Congress of Psychology, Prague, Czech Republic.

Azık Özkan, D., & Özkan T. (2019, July). Driving Decisions of Young and Old Drivers - Driving Self-Regulation. 16th European Congress of Psychology, Moscow, Russia.

Azık Özkan, D., & Özkan T. (2018, November). Trafikte Öz-Düzenleyici Davranışlar ve Sapkın Sürücü Davranışları. 20. Ulusal Psikoloji Kongresi, Ankara, Turkey.

Poster Presentations:

Azık Özkan, D., Kazemiafshar, A., & Özkan T. (2019, July). Analysis of Air Crash Accident: Root Cause Analysis of IranAir Airlines Flight 1974-IR- 277. 16th European Congress of Psychology, Moscow, Russia.

Azık Özkan, D., Kazemiafshar, A., & Özkan T. (2019, July). Root Cause Analysis of Air France Flight 447 Accident (1 June 2009). 16th European Congress of Psychology, Moscow, Russia.

Azık Özkan, D., Yüzer Günay, E., Yüce, A. N., & Öz, B. (2019, July). Examination of the Relationship between the Vehicle Segment Used and Human Factors in Driving. 16th European Congress of Psychology, Moscow, Russia.

Azık, D. Öz, B. (2018, November). Negatif ve Pozitif Duygu Durumlarının Sürücü Davranışları ile İlişkisi : Bir Alanyazın Derlemesi. 20. Ulusal Psikoloji Kongresi, Ankara, Turkey.

Azık, D., Özer, Ö. Kazemiafshar, A., Özkan T. (2018, November). Atlantik Okyanusu Turist Uçağı Kazası Kök Neden Analiz Çalışması - Birgenair 301 Sefer Sayılı Uçuşu 20. Ulusal Psikoloji Kongresi, Ankara, Turkey.

J. TURKISH SUMMARY / TÜRKÇE ÖZET

BİRİNCİ BÖLÜM

Giriş

Karayolu trafik kazaları 45 yıl önce Dünya Sağlık Örgütü'nün raporlarında önemli halk sağlığı sorunlarından biri olarak bildirilmiş ve bu felaketi kontrol altına almak için alınan yaygın önlemlere rağmen kayıp sayıları ve genel ekonomik maliyetleri hala aynı şekilde belirtilmektedir. Her yıl yaklaşık 1,3 milyon insan hayatını kaybetmekte ve 20 ila 50 milyon insan trafik kazaları nedeniyle sakatlığa neden olan veya ölümcül olmayan yaralanmalara maruz kalmaktadır. Buna ek olarak, karayolu trafik yaralanmaları hala dünyadaki morbidite, sakatlık ve mortalitenin önde gelen nedenlerinden biridir.

Trafik güvenliğinde, birbiriyle etkileşim halinde olan birçok farklı olası nedeni ayrı ayrı ele almak yerine, 1970'lerden itibaren üç ana şemsiye kategori kullanılmaktadır. Haddon, trafik güvenliği ile ilgili temel unsurları 3 ana kategori altında bir araya getirirken, bu temel unsurların kaza öncesi, sırası ve sonrasında meydana gelebilecek kayıpların sistematik bir şekilde kontrol altına alınmasında önemli bir adım olabileceğini de ortaya koymuştur (1972; 1999). O zamandan bugüne trafik güvenliği uzmanları, bu üç ana faktöre sahiptir: İnsan Faktörleri (genellikle sürücü), çevre ile ilgili faktörler (genellikle yol çevresi) ve karayolu trafik kazalarından sorumlu olabilecek araçla ilgili faktörlerdir (Evans, 1991; Forbes, 1972; Grime, 1987). Etkisi, önemi ve baskın rolü nedeniyle insan faktörleri, trafik güvenliği çalışmalarında, bunlara odaklanan müdahalelerin olası faydaları düşünüldüğünde en popüler alanlar olmuştur. Bir sürücünün yola çıkacağı ve sürmeye başlayacağı için trafik sistemi içinde güvenli bir şekilde var olabilmesi için iki şart vardır. Birincisi "gerekli algısal-motor ve bilişsel becerilere sahip mi" ikincisi ise "otomatikleştirilmiş bu becerileri güvenli ve kabul edilebilir bir şekilde kullanıyor mu?". Burada trafik çalışmalarında insan faktörü, özellikle sürücü ile ilgili çalışmalar şekillenmiş ve bu iki maddedeki eksikliklerin doğrudan

kazalarla ilgili olduğu ortaya konmuştur. İnsan faktörlerine ve özellikle sürücülere odaklanan araştırmaların ışığında, insan faktörlerinin ana bileşenleri temel olarak iki ana sürüş davranışı veya sürücü davranışı altında incelenir: sürüş becerisi/performansı "sürücünün yapabilecekleri" ve sürüş davranışı/ "sürücünün genellikle yaptığı şey" stili (Elander, West ve French, 1993; Evans, 1991, Özkan 2006). Sürüş becerileri, sürücü olmanın ilk adımıdır ve maksimum düzeyde performans ve maksimum yeteneği vurgular. Genellikle, bir aracı güvenli bir şekilde kullanmak için gerekli olan sürücünün gerçek bilgi, beceri ve algısal ve bilişsel yeteneklerini içerir. Deneyim, uygulama ve eğitimle gelişmesi beklenir ve esas olarak farklı sürüş görevlerinin performansıyla ilgilidir ve büyük bilişsel ve psikomotor becerilere ihtiyaç duyar (Elander, West ve French, 1993).

Sürüş becerileri ile ilgili ilk dikkat çekici araştırma Spolander (1983) tarafından yapılmıştır. Teknik sürüş becerileri ve defansif sürüş becerileri arasında ayrım yapıldı. Bu kategorilere göre teknik sürüş becerileri genel olarak hızlı ve akıcı araç kontrolü ve trafik durum yönetimi ile ilgiliydi. Diğer kategori, önceden tahmin edilen kazalardan kaçınma risklerini içeren defansif sürüş becerileridir (Spolander, 1983). Öte yandan, sonraki çalışmalarda, araba kontrol becerileri ve geri bildirim mekanizması süreçlerinden ziyade önemi vurgulanmış, sürüş görevi taleplerinin kendi yetenek ve becerilerine göre ayarlanmasına işaret edilmiştir. Bu düşünceyle, Lajunen ve Summala, sürüş becerilerinin içeriğini genişleterek, algısal-motor beceriler ve güvenlik becerileri olmak üzere iki farklı tür sürüş becerisi sağlar (Özkan ve Lajunen, 2011). Algısal-motor beceriler, genel teknik ve araba kullanma becerilerinden oluşur. ve özellikle araba kullanmayı öğrenirken son derece önemlidir. Bu beceriler bir arabayı kullanmak için çok önemlidir ve sürücülerin belirli trafik durumlarındaki potansiyel eylemleriyle ölçülür (Bener, Lajunen, Özkan ve Haigney, 2006; Martinussen, Moller ve Prato, 2014). Güvenlik becerileri, sürücülerin sürüş görevini yeteneklerini aşmayacak şekilde yapma becerileri olan, önceden tahmin edilen kazalardan kaçınma riskleriyle ilgili becerilerdir. Yüksek güvenlik becerisine sahip bir sürücü, sürücünün güvenli, kurallara itaatkar ve riskten kaçınması anlamına gelir (Özkan ve Lajunen, 2011). Daha önce de belirtildiği gibi, bu belirleyicilerin her ikisi de algısal-motor

beceriler ve güvenlik becerileri, karayolu trafik kazaları ve yaralanmaları ile güçlü bir şekilde ilişkilidir. Ayrıca genel sürüş becerilerini ölçmek için bu iki belirleyici ele alınmıştır.

Sürüş davranışları, diğer bir deyişle sürüş stili, sürücülerin sürüş alışkanlıkları ve sürücünün genellikle ne yaptığı ile ilgilidir. Sürücü performansından farklı olarak bu tarzın oluşması için bir süre gereklidir. Sürüş davranışları için ne yazık ki yıllar ve deneyim güvenlik anlamına gelmez ve bu tarz edinim ile sürüş davranışları riskli hale gelebilir. Reason'ın İnsan Hatası Teorisinde ana odak, karayolu trafik kazalarında bireysel farklılıkların tahminini bulmayı amaçlayan anormal sürüş davranışlarını ölçmektir (Wahlberg, Dorn ve Kline, 2011). Ayrıca, bu insan hatası çerçevesinde, karayolu trafik kazalarının nedenindeki bireysel farklılıkları belirlemek için iki farklı sapma sınıfı tartışılmıştır. Bu sınıflandırma esas olarak hatalar ve ihlallerle ilgilidir (Smorti ve Guarnieri, 2016). Bu iki kavram farklı psikolojik kökenlere ve farklı iyileştirme tarzlarına dayanır ve eylemin arkasındaki niyet açısından birbirlerinden ayrılabilirler (Reason, Manstead, Stradling, Baxter ve Campbell, 1990). Hatanın tanımı "planlanan eylemlerin amaçlanan sonuçlara ulaşamamasıdır" (Reason ve diğerleri, 1990, s. 1315) ve bilişsel işlem problemlerini kapsar. Bu tür anormal davranışlar, daha iyi bilgiye ulaşılarak en aza indirilebilir ve kontrol edilebilir.

Hatalar ve ihlaller olarak ana kategorizasyonun ardından yapılan çalışmalar bunun farklı hata türleri olabileceğini ortaya koydu. Bazı hatalar, kaymalar ve sapmalar olan orijinal niyetlerden istem dışı sapmaların sonucu olabilir. Ya da bazı planlanmış eylemler başarılı bir şekilde sonlandırılamamış ve hata olan eylemlerin istenen hedefinden sapmış olabilir. Hatalar genellikle kötü karar sonuçlarıyla ilgilidir ve bilgi işlemedeki başarısızlıklara dayanır. Bunlara ek olarak, bu ayrımda, kaymalar ve atlamalar, sürüş güvenliğini tehlikeli bir şekilde etkilemekten ziyade utanmaya neden olabilecek hafıza başarısızlıklarını ve dikkat eksikliklerini kapsar. Ayrıca, bu tür bir hata, diğer yol kullanıcıları için aracınızı nereye park ettiğinizi unutmak gibi çok az risk taşır (Iliescu ve Sarbescu, 2013; Wahlberg, Dorn ve Kline, 2011). Hatalardan farklı olarak, kişi ihlal yaparsa,

hatalardaki gibi basit bir reçete yoktur. İhlalleri kontrol altına almak için öncelikle o davranışın altında yatan kişinin inançlarını, normlarını ve tutumlarını değiştirmek gerekir.

İhlalin tanımı "potansiyel olarak tehlikeli bir sistemin güvenli işleyişini sürdürmek için gerekli olduğuna inanılan uygulamalardan kasıtlı sapmalar"dır (Reason ve diğerleri, 1990, s. 1316) ve motivasyonel bileşeni ve bağlamsal talebi kapsar. İhlaller kasıtlı davranışlar olarak görülebilir (Lajunen ve Özkan, 2011). Yapılan çalışmalarda sürüş becerileri ile sürüş davranışları arasında bir ilişki olduğu açıktır, ancak ölçümün kapsamına bağlı olarak bu ilişkinin türü, etkileyen yan faktörler ve aslında genel mekanizma farklılaşabilmektedir. Bu çalışmada, bu ilgili faktörler ve açıklanan ilişkiler dışında, bildirilen sürüş becerileri ile sürüş davranışları arasındaki ilişki farklı bir bakış açısı ve farklı bir odakla incelenecektir. Yani, konu öncelikle kendi sürüş becerilerinin değerlendirilmesi ile ilgiliyse, asıl odak noktası öncelikle insanların becerilerinin olduğunu düşündükleri koşullar olmalıdır. Örneğin, kişilerin becerilerinin üstün olduğunu düşündüklerinde aşırı özgüvenli olabilecekleri, daha fazla güvenlik marjı açıldığı ve daha fazla ihlal yapıldığı belirtilmiştir (Lajunen ve Özkan, 2011; Lajunen, Corry, Summala ve Hartley, 1998). Bu aşırı özgüvenli gruplardan biri de genç erkek sürücüler veya dürtüsel sürücülerdir (Wohleber ve Matthews, 2016). Sürüş becerilerinin azaldığını veya yeterince gelişmediğini düşünen diğer gruplar, yeni kullanıcılar (Scott-Parker, 2012), bir şekilde engelli sürücüler, yaşlılar (Freund, Colgrove, Burke, McLeod, 2005) veya sürüş deneyimi olan gruplar olabilir. kaza geçirmiş veya bir kaza sonucu travmatize olmuşlardır (Senserrick, 2006). Burada genellikle olan şey, sürücü kaçınma ya da fobi yaşarken, yani endişeli bir durumdayken araç kullanmaya devam ettiğinde, bilişsel dengeyi bir şekilde sağlayamadığı için daha kasıtsız anormal davranışlar yaşayabilir. önceki kısımlar (Azık, 2015; Motak, Gabaude, Bougeant ve Huet, 2014).

Kendine aşırı güvenenler, edebiyatın zaten odaklandığı grup haline geldi. Bununla birlikte, diğer grup (yani "kendinden emin olmayanlar"), genellikle araç kullanmaktan kaçınanlar veya klinik grup sınıflandırmasına dahil edilenler olarak

kabul edildiğinden, sınırlı çalışmaların konusu gibi görünmektedir. Daha açık bir şekilde açıklamak gerekirse, daha önce yapılan çok sayıda çalışmada, yüksek düzeyde sürüş becerisine sahip olduğunu bildiren kişiler üzerinde farklı araştırmalar yapılmıştır. Ancak çekingen ya da korkan kişilerle araç kullanma beceri ve davranışlarını araştıran çalışmaların sayısı sınırlıdır. Kişilerin klinik olarak kaygılı olarak etiketlenmeseler de zaman zaman anlık ya da dönemsel olarak bazı değişiklikler yaşayabildikleri bilinmektedir. Araba kullanmak, herhangi bir iç ve dış faktörden etkilenen günlük bir aktivitedir. Yani insanların günlük ve/veya anlık öz değerlendirmeleri de günlük ve/veya anlık davranışlarını etkileyebilir.

İnsanların genellikle sürüş performansını idealleştirmeye çalıştıkları bilinmektedir. İnsanlar performanslarını sürdürürken veya idealleştirirken, bilişsel yargıları ve bilişleri performanslarına veya eylemlerine müdahale edebilir. İnsanların araç kullanırken birçok endişesi olabilir, ancak bu endişelerin kritik rolüne odaklanan çalışmalar çok sınırlıdır (Ehlers, Taylor, Ehring, Hormann, Deane, Roth ve Podd, 2007). Öte yandan sürücülerin araç kullanma görevlerini etkileyebilecek kaygılara ilişkin sınırlı sayıdaki çalışmalar da bazı önemli bilgiler sunmaktadır. Her şeyden önce, araba kullanmayla ilgili bu endişelerle birlikte araba kullanma kaygısı da artmaktadır (Ehlers, Hofmann, Herda ve Roth, 1994). Ayrıca kaygının araç kullanmayla ilgili olumsuz düşünceleri tetiklediğini bildiren çalışmalar da bulunmaktadır (Eysenck, Derakshan, Santos ve Calvo, 2007). Bunlara ek olarak, sürücü tarafından bildirilen kaygı düzeyi de bu noktada önemli bir faktördür çünkü bu kaygı düzeyi, kişinin trafik ortamına ilişkin algı ve davranışlarını etkiler (Costa ve McCrae, 1992). Araştırmalar, kendi becerilerine güvenmeyen kişilerin daha fazla stres ve kaygı yaşadıklarını ve sürüş tarzlarının buna göre şekillendiğini göstermektedir (Taubman-Ben-Ari, Mikulincer ve Gillath, 2004). Bu bulgular kaygılar, insanların kendi becerilerine ilişkin düşünceleri, trafik ortamına ilişkin düşünceleri ve kaygı arasındaki ilişkiyi ortaya koymaktadır.

Sürüş literatürü, kaygı araştırmalarında sınırlıdır. Ancak genel kaygı literatürünün kapsamlı çalışmaları incelendiğinde, sürüş davranışlarına uyarlanabilen ve ilgili literatürü destekleyen şematik bir temsilin oluşturulabileceği görülmektedir. Bu şematik temsil bize bütünleştirici bir model gösterir ve kaygı, beceri ve performansı içerir. Tabii ki, buradaki beceriler, sürüş eylemi ile ilgili değildir ve yine klinik örneklem için, özellikle sosyal fobisi olan kişiler için bir şemadır (Hopko, McNeil, Zvolensky ve Eifert, 2001). Modelin ilgi çeken kısmında, kişilerin becerileri bilişsel önyargılar ve kaygılı tepki kanalları aracılığıyla performans açıklarına ulaşır, yeterliyse rasyonel tepkiye ve ardından yeterli performansa ulaşabilirler. Beceriler yeterince güçlü değilse, bu performans açıklarına dönüşebilir. Yani bir kişinin yetenekleri konusunda yeterli farkındalığı yoksa, bu kişinin trafik ortamına ilişkin sürücülük kaygıları ve bilişleri davranışsal kusurlara dönüşebilir ya da aynı mantıkla becerileri yine davranış bozukluklarına dönüşebilir: kaygının aracı etkisi.

Yukarıda verilen bilgiler ışığında, her ne kadar literatürde araç kullanma becerileri ve sürüş davranışları sıklıkla araştırılsa ve aralarındaki ilişkiler incelense de kaygı ile ilişkili faktörlerin her zaman sınırlı (kaçınan) veya klinik gruplar içinde değerlendirildiği söylenebilir. Ancak kaygı da öfke gibi gün içinde sıklıkla yaşanan ve eylemlerimizi yönlendirirken etkili olan olumsuz bir duygu durumudur (Deffenbacher ve ark. 2000). Literatürde beceri, kaygı ve davranışlara odaklanan yeterli çalışma bulunmamaktadır. Aslında bu sınırlılık, kaygı araştırmalarında bu değişkenler arasındaki ilişkinin ilgili alan veya bağlam ne olursa olsun çalışılmamış olmasının bir yansıması olabilir (Hopko, McNeil, Zvolensky, Eifert, 2001).

Bu nedenle, mevcut araştırmanın trafik araştırma alanındaki bu boşluğu doldurmaya çalışan bir araştırma olması planlanmıştır. Bu amaçtan hareketle, literatürde ilk kez trafik ortamına ilişkin değişken kaygı ve kaygılarla, kişinin kendi bildirdiği sürüş becerileri ile anormal ve endişeli sürüş davranışları arasındaki ilişki farklı bir bakış açısıyla ayrıntılı olarak incelenmiştir. Sonuç olarak, bu çalışmada, beceri ve davranış arasındaki ilişkide araç kullanma ile ilgili

bilişlerin (kazayla ilgili endişeler, panikle ilgili endişeler ve sosyal endişeler), süreklilik ve durumluk kaygı düzeylerinin rolü önerilmektedir. Araştırmanın değişkenleri arasında tartışılan incelemeyi yapan ilk çalışma olması ve bazı ölçme araçlarının bu bağlamda ve kültürde ilk kez kullanılması nedeniyle söz konusu aracılık ilişkilerinin istatistiksel olarak incelenmesi ayrı ayrı yapılacaktır. tam bir arabuluculuk modeli testine ek olarak. Buna göre üç araştırma sorusu aşağıdaki bölümde yer almaktadır.

Araştırma Sorusu 1: Sürüş becerileri ile sürüş davranışları arasındaki ilişki, sürüşle ilgili bilişlerin aracılık ettiği bir ilişki midir?

Araştırma Sorusu 2: Sürüş becerileri ile sürüş davranışları arasındaki ilişkiye sürücülerin durumluk ve sürekli kaygı düzeyleri aracılık ediyor mu?

Araştırma Sorusu 3: Sürüş becerileri ile sürüş davranışları arasındaki ilişki, modele aynı anda dahil edildiğinde hem sürüşle ilgili biliş hem de kaygı düzeyi aracılık ediyor mu?

İKİNCİ BÖLÜM

Yöntem

2.1. Örneklem

Çalışmaya toplam 484 sürücü katılmıştır. Katılımcılar 18 ila 71 yaşları arasındaydı (Ort. = 32.56, SD = 8.42) ve hem kırsal hem de kentsel kökenden geliyordu. Örneklemin yarısından biraz fazlası kadın (N = 260; %53.7), katılımcıların diğer kısmı erkek (N = 222; %45.9) ve katılımcılardan 2'si cinsiyet sorularını yanıtlamak istemedi (%0.4). Ayrıca örneklemin demografik bilgilerinin ilk adımı olarak eğitim bilgileri taraması da yapılmış olup, katılımcıların 48'inin (%9,9) doktora, 107'sinin (%22,1) yüksek lisans mezunu olduğu, Katılımcıların 283'ü (%58,5) üniversite, 43'ü (%8,9) lise ve son olarak üçü (%0,6) ortaokul mezunudur.

2.2. Veri Toplama Araçları

Demografik Bilgi Formu: Ana anket paketinin uygulanmasından önce katılımcılara bilgilendirilmiş onam formu verildi. Daha sonra deneklerden yaş, cinsiyet, geçen yılki kilometre, pasif ve kusurlu kaza sıklığı ve trafik cezası gibi tanımlayıcı değişkenleri ve katılımcıların ceza sıklığı gibi tanımlayıcı değişkenleri içeren bir demografik bilgi formu doldurmaları istenmiştir. Ayrıca demografik form, katılımcıların seçtikleri seyahat şekillerine ilişkin bilgileri içermektedir. Bu bilgilere örnek olarak kışın bildirilen sıklık, yoğun trafik, ana yollar, şehirler arası yollar, şehir içi yollar ve herhangi bir durum verilebilir.

Sürücü Becerileri Ölçeği: Demografik formu, sürüşün farklı yönleriyle ilgili becerilerinin öz değerlendirmesini ölçmek için Sürücü Beceri Envanteri (SBÖ) uygulaması izledi. Sürücü Beceri Envanteri (DSİ), Lajunen ve Summala (1995) tarafından geliştirilen, 20 madde ve 2 alt ölçekten oluşan bir öz-bildirim ölçüsüdür. Ölçüm, 1'den (çok zayıf) beşe (çok güçlü) kadar 5'li Likert tipinde yapılmıştır, bu da daha yüksek puanların daha yüksek beceri düzeyine işaret ettiği anlamına gelir. Algısal-motor beceriler (13 madde) ve güvenlik becerilerini (7 madde) kapsar.

Sürülükte Bilişsel Yargılar Anketi: Sürücülükte Bilişsel Yargılar Anketi (SBYA), deneklerin sürüşle ilgili biliş ve kaygı temelli kaygılarının sıklığını ölçmek için tasarlandı ve 2007'de Ehlers, Taylor, Ehring, Hofman, Deane, Roth ve Podd tarafından geliştirildi. Araç kullanırken her bir düşüncenin ne sıklıkta ortaya çıktığını ölçmek için maddelerden ve katılımcılardan 5'li Likert ölçeği (0 = Hiçbir zaman ila 4 = Her zaman) yanıtlamaları istendi ve daha yüksek puanlar sürüşle ilgili daha olumsuz endişeler anlamına geliyor. Orijinal ölçek, panikle ilgili bilişler, kazaya neden olma endişeleri ve sosyal endişeleri kapsayan 3 alt ölçek içermektedir. Alt ölçekler panikle ilgili endişeler, kazayla ilgili endişeler ve sosyal endişeler olarak etiketlenmiştir.

Durumluk-Sürekli Kaygı Envanteri: Katılımcıların kaygı düzeyleri Durumluk-Sürekli Kaygı Envanteri ile değerlendirilmiştir (Spielberger, Gorscuh, Lushene,

Vagg ve Jacobs, 1983). Bu ölçme aracı, genellikle sadece o anda ne hissedildiği hakkında bilgi veren (durumluk kaygı) ve aynı zamanda stresli durumların ne kadar tehdit edici olduğuna dair kalıcı eğilimleri (sürekli kaygı) ölçen iki ayrı alt ölçekten oluşan kısa ifadelerden oluşmaktadır. Ölçeklerin her biri 20 kısa ifadeden (toplam 40 madde) oluşmakta ve katılımcılardan 1 (neredeyse hiç) ile 4 (hemen hemen her zaman) arasında değişen 4'lü Likert Ölçeği üzerinde yanıt vermeleri istenmektedir.

Sürücü Davranışları Ölçeği: Endişeli sürüş davranışları, 2011 yılında Clapp, Olsen, Beck, Paleoyo, Grant, Gudmundsdottir ve Marques tarafından geliştirilen Sürüş Davranışı Anketi (SDÖ) ile ölçülmüştür. Bu anket 21 maddeden oluşan bir öz bildirim aracıdır, Katılımcılar kendilerini değerlendirmiştir. Orijinal anket, düşmanca/saldırgan davranışlar (7 madde), kaygıya dayalı performans eksikliği veya kaygıya bağlı performans eksiklikleri (7 madde), abartılı güvenlik ve aşırı temkinli davranışlar veya abartılı güvenlik/ihtiyat davranışları (7 madde) olmak üzere 3 alan içermektedir.

Sürücü Davranışları Anketi: Sapık sürücü davranışları, Sürücü Davranışı Anketinin (SDA) genişletilmiş versiyonu ile ölçülmüştür. Bu anketin farklı versiyonları mevcuttur ve çalışmaların amacına bağlı olarak, maddelerin farklı benzersiz kombinasyonları kullanılmıştır. Bu çalışmada 42 maddelik versiyon ve 5 alt ölçekli, altılı Likert tipi yanıtlarla (0 = Hiçbir zaman; 5 = Neredeyse Her Zaman) kullanılmıştır.

2.3. Prosedür

Veri toplama sürecinden önce Orta Doğu Teknik Üniversitesi (ODTÜ) İnsan Denekleri Etik Kurulu'ndan (HSEC) izin alınmıştır. Bu çalışmanın verileri internet üzerinden toplanmıştır ve Covid 19 Pandemisi nedeniyle online olarak atanan bir çalışmadır. Geçerli sürücü belgesine sahip kişilere ulaşabilmek için internet ortamında dağıtılmak üzere bir metin ve el ilanı hazırlanmış ve bu çalışmanın linki eklenmiştir. Etik kurul izni alındıktan sonra, katılımcılara bilgilendirilmiş onam

ile birlikte anket el ilanı ve metin sosyal medya aracılığıyla dağıtılmış ve veriler kartopu örnekleme yöntemiyle toplanmıştır. Tüm katılımcılar araştırmaya gönüllü olarak katılmıştır. Ayrıca tüm katılımcılara çalışmanın amacı ve içeriği hakkında bilgi verilmiş, ayrıca verilerin doktora tezi için kullanılacağı konusunda bilgilendirilmiştir.

ÜÇÜNCÜ BÖLÜM

Sonuçlar

3.1. Aracı Değişken Analiz Sonuçları

Algısal-Motor Becerileri ile Sürücü Davranışları Arasındaki Kaza-Panik ile ilgili Endişeler için Aracılık Analizi (Araştırma Sorusu 1): İlk aracılık analizi, algısal-motor beceriler ve kaygı-performans eksiklikleri arasındaki kaza-panik ile ilgili endişelerin potansiyel aracılık rolü için yapılmıştır. Sonuçlar, algısal-motor becerilerin kaza-panik ile ilgili endişelerin önemli bir yordayıcısı olduğunu göstermiştir (B = -.30, SE = .04, %95 GA [.-.38, --.22], β = -.33, p = .00) ve kaza-panikle ilgili endişeler, anksiyete-performans eksikliklerinin önemli bir yordayıcısıdır (B = .47, SE =.05, %95 GA [.37, .56], β = .40, p = . 00). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler hala anlamlı bir yordayıcıydı, ancak yordama gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.40, SE = .04, %95 CI [-.48, -.31], P = -.37, p = 00). Üçüncü aracılık analizi, algısal-motor beceriler ile abartılı güvenlik/dikkat davranışları arasındaki kaza-panik ile ilgili endişelerin potansiyel aracılık rolü için yapılmıştır. Sonuçlar, algısal-motor becerilerin kaza-panik ile ilgili anlamlı bir yordayıcı olduğunu gösterdi (B = -.30, SE =.04, %95 GA [-.38, -.22], β = -.33, p = . 00) ve kaza paniğiyle ilgili endişeler, abartılı güvenlik/ihtiyat davranışlarının önemli bir yordayıcısıdır (B = .42, SE =.08, %95 GA [.26, .58], β = .26, p = .00) . Bu ilişkilere ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler artık tam aracılık ile tutarlı olan abartılı güvenlik/dikkat davranışları için anlamlı bir yordayıcı olarak bulunmamıştır (B =

-.04, SE = .07 %95 CI [-.18, .09], P = -.03, p = .54). Dördüncü aracılık analizi, algısal-motor beceriler ve gecikmeler arasındaki kaza-panik ile ilgili endişelerin potansiyel aracılık rolü için yapılmıştır. Sonuçlar, algısal-motor becerilerin kaza-panik ile ilgili s'nin anlamlı bir yordayıcısı olduğunu gösterdi (B = -.31, SE =.04, %95 GA [-.39, -.22], β = -.34, p = .00) ve kaza-panikle ilgili endişeler, gecikmelerin önemli bir yordayıcısıdır (B = .19, SE = .05, %95 GA [.10, .29], β = .21, p = .001). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler hala anlamlı bir yordayıcıydı, ancak yordayıcı gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.17, SE = .04, %95CI [-.25, 1-.09], β = .21, p = .001). Algısal-motor beceriler arasındaki kaza-panik ile ilgili endişelerin potansiyel aracılık rolü için beşinci aracılık analizi yapıldı. ve hatalar. Sonuçlar, algısal-motor becerilerin kaza-panik ile ilgili endişelerin önemli bir yordayıcısı olduğunu gösterdi (B = -.31, SE = .04, %95 GA [-.39, -.22], β = -.34, p = .00) ve kaza-panikle ilgili endişeler, hataların önemli bir yordayıcısıdır (B = .20, SE = .05, %95 GA [.10, .31], β = .20, p = .001). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler artık tam aracılık ile tutarlı olan hatalar için anlamlı bir yordayıcı olarak bulunmamıştır (B = -.06, SE = .04, %95). CI [-.16, .03], β = -.07, p = .20). Bu ilişki için toplam etki ve aracılık modeli Şekil 13'te görülebilir. Ayrıca bu analize ilişkin tüm ilgili değerler Tablo 7'de görülebilir. Olağan ihlaller ve saldırgan ihlaller için diğer arabuluculuk analizi, algısal-motor beceriler ve sonuç davranışları arasındaki kaza-panik ile ilgili endişelerin potansiyel aracılık rolü için de gerçekleştirilmiştir, ancak önerilen bu modeller için kaza-panik ile ilgili endişelerin herhangi bir aracılık rolü bulunmamıştır, bu nedenle test edilen bu modeller bu bölümde rapor edilmemiştir.

Algısal-Motor Beceriler ile Sürücü Davranışları Arasındaki Sosyal Endişeler için Aracılık Analizi (Araştırma Sorusu 1): İlk olarak, sosyal kaygıların algısal-motor beceriler ile düşmanca/saldırgan davranışlar ile abartılı güvenlik/nedensellik davranışları arasındaki potansiyel aracılık rolü için aracılık analizi yapıldı ve önerilen bu modeller için kaza-panik ile ilgili kaygıların aracılık rolü bulunamadı. İkinci aracılık analizi, sosyal kaygıların algısal-motor beceriler

ile kaygı-performans eksiklikleri arasındaki potansiyel aracılık rolü için yapılmıştır. Sonuçlar, algısal-motor becerilerin sosyal kaygıların önemli bir yordayıcısı olduğunu gösterdi (B = -51, SE = .04, %95 GA [-.59, -.43], β =.-.51, p = .00) ve sosyal kaygılar, kaygı-performans eksikliklerinin önemli bir yordayıcısıdır (B = .32, SE = .05, %95 GA [.22, .42], β = .30, p = .00). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler hala anlamlı bir yordayıcıydı, ancak yordayıcı gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.37, SE = .05, %95 CI [-.47, -28], p = -.35, p = .00). Üçüncü aracılık analizi, sosyal kaygıların algısal-motor beceriler ve gecikmeler arasındaki potansiyel aracılık rolü için yapılmıştır. Sonuçlar, algısal-motor becerilerin sosyal kaygıların önemli bir yordayıcısı olduğunu gösterdi (B = -.53, SE = .04, %95 GA [-.62, -.44], β = -.53, p = .00) ve sosyal kaygılar, gecikmelerin önemli bir yordayıcısıdır (B = .22, SE = .05, %95 GA [.13, .32], β = .27, p = .00). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler hala anlamlı bir yordayıcıydı, ancak yordayıcı gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.11, SE = .05, %95CI [-.21, -.02], β = -.13, p = .02). Dördüncü aracılık analizi, sosyal kaygıların algısal-motor beceriler ve hatalar arasındaki potansiyel aracılık rolü için yapıldı. Sonuçlar, algısal-motor becerilerin sosyal kaygıların önemli bir yordayıcısı olduğunu gösterdi (B = -.53, SE = .04, %95 GA [-.62, -.44], β = -.53, p = .00) ve sosyal kaygılar, hataların önemli bir yordayıcısıdır (B = .18, SE = .05, %95 GA [.07, .28], β = .20, p = .008). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler artık tam aracılık ile tutarlı olan hatalar için anlamlı bir yordayıcı olarak bulunmadı (B = -.03 SE = .05, %95 CI [-.13, .07], β =. -03, p = .58). Algısal-motor beceriler ve sonuç davranışları arasındaki sosyal kaygıların potansiyel aracılık rolü için sıradan ihlaller ve saldırgan ihlaller için diğer aracılık analizi de yapıldı, ancak önerilen bu modeller için sosyal kaygıların aracılık rolü bulunamadı, bu nedenle test edilen bu modeller bu bölümde rapor edilmemektedir.

Algısal-Motor Beceriler ile Sonuç Sürüş Davranışları Arasındaki Sürekli Kaygı için Aracılık Analizi (Araştırma Sorusu 2): İlk olarak, sürekli kaygının algısal-

motor beceriler ile düşmanca/saldırgan davranışlar ile abartılı güvenlik/dikkat davranışları arasındaki potansiyel aracılık rolü için aracılık analizi yapılmış ve önerilen bu model için kaza-panik ile ilgili kaygıların aracılık rolü bulunamamıştır. İkinci aracılık analizi, sürekli kaygının algısal-motor beceriler ile kaygı-performans eksiklikleri arasındaki potansiyel aracılık rolü için yapılmıştır. Sonuçlar, algısal-motor becerilerin sürekli kaygı (B = -.20, SE =, %95 GA [-.26, -.13], β = -.27, p = .00) ve süreklilik için anlamlı bir yordayıcı olduğunu gösterdi. kaygı, kaygı-performans eksikliklerinin önemli bir yordayıcısıdır (B = .26, SE = .06,95% GA [.13, .38], β = .17, p = .00). Bu ilişkilere ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.48, SE = .04, %95 CI [-.58, -.40], p = -.45, p = .00). Sürekli kaygının algısal-motor beceriler ve gecikmeler arasındaki potansiyel aracılık rolü için üçüncü aracılık analizi yapıldı. Sonuçlar, algısal-motor becerilerin sürekli kaygının önemli bir yordayıcısı olduğunu gösterdi (B = -.22, SE = .03, %95 GA [-.28, -.15], β = -.31, p = .00) ve sürekli kaygı, gecikmelerin önemli bir yordayıcısıdır (B = .21, SE = .06, %95 GA [.09, .33], β = -.22, p = .001). Bu sonuçlar önerilen aracılık hipotezi ile tutarlıdır. Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler hala anlamlı bir yordayıcıydı, ancak yordayıcı gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.19, SE = .04, %95CI [-.27, -.10], β = -.22, p = .00). Sürekli kaygının algısal-motor beceriler ve hatalar arasındaki potansiyel aracılık rolü için dördüncü aracılık analizi yapıldı. Sonuçlar, algısal-motor becerilerin sürekli kaygının önemli bir yordayıcısı olduğunu gösterdi (B = -.22, SE = .03, %95 GA [-.28, -.15], β = -.31, p = .00) ve sürekli kaygı, hataların önemli bir yordayıcısıdır (B = .25, SE = .07, %95 GA [.11, .39], β = .19, p = .00). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, algısal-motor beceriler artık tam aracılık ile tutarlı olan hatalar için anlamlı bir yordayıcı olarak bulunmamıştır (B = -.07, SE = .05, %95). CI [-.16,.02], β = -.08, p = .14). Sıradan ihlaller ve saldırgan ihlaller için diğer arabuluculuk analizi, sosyal kaygıların güvenlik becerileri ve sonuç davranışları arasındaki potansiyel aracılık rolü için de yapıldı.

Önerilen bu modeller için sosyal kaygıların herhangi bir aracılık rolü bulunmamıştır, bu nedenle test edilen bu modeller bu bölümde rapor edilmemiştir.

Güvenlik Becerileri ve Sürücü Davranışları Arasındaki Kaza-Panik İle İlgili Endişeler İçin Arabuluculuk Analizi (Araştırma Sorusu 1: İlk aracılık analizi, güvenlik becerileri ile düşmanca/saldırgan davranışlar ve abartılı güvenlik/ihtiyat davranışları arasında kaza panikiyle ilgili endişelerin potansiyel aracılık rolü için yapıldı ve önerilen bu model için kaza panikle ilgili endişelerin herhangi bir aracılık rolü bulunamadı. İkinci aracılık analizi, güvenlik becerileri ve kaygı-performans açıkları arasındaki kaza-panik ile ilgili endişelerin potansiyel aracılık rolü için yapılmıştır. Sonuçlar, güvenlik becerilerinin kaza panikiyle ilgili endişelerin önemli bir yordayıcısı olduğunu gösterdi (B = -.26, SE = .06, %95 GA [-.37, -.14], β = -.21, p = .00) ve kaza-panikle ilgili endişeler, kaygı-performans eksikliklerinin önemli bir yordayıcısıdır (B = .54, SE = .05, %95 GA [.45, .63], β = .46, p = .00). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.43, SE = .06 , %95CI [-.55, -.32], β =.-.29, p = .00). Üçüncü arabuluculuk analizi, kaza paniği ile ilgili endişelerin güvenlik becerileri ve gecikmeler arasındaki potansiyel aracılık rolü için yapıldı. Sonuçlar, güvenlik becerilerinin kaza panikiyle ilgili endişelerin önemli bir yordayıcısı olduğunu gösterdi (B = -.28, SE = .06, %95 GA [-.40, -.16], β = -.23, p = .00) ve kaza paniğiyle ilgili endişeler, gecikmelerin önemli bir yordayıcısıdır (B = .20, SE = .04, %95 GA [.11, .29], β = .21, p = .00). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.30, SE = .05 , %95CI [-.41, -.19], β = -.26, p = .00).Dördüncü arabuluculuk analizi, kaza paniği ile ilgili endişelerin güvenlik becerileri ve hatalar arasındaki potansiyel aracılık rolü için yapıldı. Sonuçlar, güvenlik becerilerinin kaza panikiyle ilgili endişelerin önemli bir yordayıcısı olduğunu gösterdi (B =-.28, SE = .06, %95 GA [-.40, -.16], β = -.23, p = .00) ve kaza paniğiyle ilgili endişeler, hataların önemli bir yordayıcısıdır (B = .17, SE = .05, %95 GA [.07, .27], β = .17, p = .001). Bu ilişkiye ek olarak,

arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri artık tam aracılık ile tutarlı olan hatalar için önemli bir öngörücü olarak bulunmamıştır (B = -.32, SE = .06, %95 CI [-.44, -.20], β = -.26, p = .00). Sıradan ihlaller ve saldırgan ihlaller için diğer arabuluculuk analizi, kaza panikiyle ilgili endişelerin güvenlik becerileri ve sonuç davranışları arasındaki potansiyel aracılık rolü için de gerçekleştirilmiştir, ancak önerilen bu modeller için kaza panikle ilgili endişelerin herhangi bir aracılık rolü bulunmamıştır, bu nedenle bu test edilen modeller bu bölümde rapor edilmedi.

Güvenlik Becerileri ile Sürücü Davranışları Arasındaki Sosyal Endişeler İçin Arabuluculuk Analizi (Araştırma Sorusu 1): İkinci aracılık analizi, sosyal kaygıların güvenlik becerileri ile kaygı-performans açıkları arasındaki potansiyel aracılık rolü için yapılmıştır. Sonuçlar, güvenlik becerilerinin kaza panikiyle ilgili endişelerin önemli bir yordayıcısı olduğunu gösterdi (B = -.42, SE = .06, %95 GA [-.55, -.30], β = -.31, p = .00) ve sosyal kaygılar, kaygı-performans eksikliklerinin önemli bir yordayıcısıdır (B = .43, SE = .05, %95 GA [.34, .52], β = .40, p = .00). Bu ilişkiye ek olarak, aracının istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = .43, SE = .06, %95 CI [-.52, -.27], β = -.27, p = .00). Üçüncü aracılık analizi, sosyal kaygıların güvenlik becerileri ve gecikmeler arasındaki potansiyel aracılık rolü için yapıldı. Sonuçlar, güvenlik becerilerinin sosyal kaygıların (B = -.45, SE = .06, %95 GA [-.58, -32], β = -.33, p = .00) ve sosyal kaygıların önemli bir yordayıcısı olduğunu gösterdi. gecikmelerin önemli bir tahmincisiydi (B = .22, SE = .04, %95 GA [.14, .30], β = .26, p = .00). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.26, SE = .06, %95 CI [-.37, -.15], β = -.22, p = .00). Dördüncü aracılık analizi, sosyal kaygıların güvenlik becerileri ve hatalar arasındaki potansiyel aracılık rolü için yapıldı. Sonuçlar, güvenlik becerilerinin sosyal kaygıların (B =-.45, SE = .06, %95 GA [-.58, -.32], β = -.33, p = .00) ve sosyal kaygıların önemli bir yordayıcısı olduğunu gösterdi. endişeler, hataların önemli bir tahmincisiydi (B = .12, SE = .05, %95 GA [.03, .21], β = .13,

p = .01). Bu sonuç, önerilen aracılık hipotezi ile tutarlıdır. Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri artık tam aracılık ile tutarlı olan hatalar için önemli bir tahmin edici olarak bulunmamıştır (B = -.31, SE = .06, %95 CI [-.44, -.19], β = -.25, p = .00).Sıradan ihlaller ve saldırgan ihlaller için diğer arabuluculuk analizi de sosyal kaygıların güvenlik becerileri ve sonuç davranışları arasındaki potansiyel aracılık rolü için yapılmıştır, ancak, Önerilen bu modeller için sosyal kaygıların herhangi bir aracı rolü bulunmamıştır, bu nedenle test edilen bu modeller bu bölümde rapor edilmemiştir.

Güvenlik Becerileri ile Sürücü Davranışları Arasındaki Sürekli Kaygı için Aracılık Analizi (Araştırma Sorusu 2): Sonuçlar, güvenlik becerilerinin sürekli kaygı (B = -.27, SE = .04, %95 GA [-.36, -.18], β = -.28, p = .00) ve sürekli kaygının önemli bir yordayıcısı olduğunu gösterdi. kaygı, düşmanca/saldırgan davranışların önemli bir yordayıcısıdır (B = .38, SE = .11, %95 GA [.14, .62], β = .15, p = .002). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B =.-.52, SE = . 11, %95 CI [-.75,1. -.29, β = -.22, p = .00). İkinci aracılık analizi, sürekli kaygının güvenlik becerileri ile kaygı-performans eksiklikleri arasındaki potansiyel aracılık rolü için yapıldı. . Sonuçlar, güvenlik becerilerinin sürekli kaygı (B = -.27, SE = .04, %95 GA [-.36, -.18], β = -.28, p = .00) ve sürekli kaygının önemli bir yordayıcısı olduğunu gösterdi. kaygı, kaygı-performans eksikliklerinin önemli bir yordayıcısıdır (B = -.49, SE = .07, %95 GA [.18, .44], β = .21, p = .00). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.49, SE = .06). , %95CI [-62, -.36], p = -.33, p = .00). Sürekli kaygının güvenlik becerileri ile abartılı güvenlik/dikkat davranışları arasındaki potansiyel aracılık rolü için üçüncü aracılık analizi yapılmış ve önerilen bu modeller için sürekli kaygının aracılık rolü bulunamamıştır. Dördüncü aracılık analizi, sürekli kaygının güvenlik becerileri ve gecikmeler arasındaki potansiyel aracılık rolü için yapılmıştır. Sonuçlar, güvenlik

becerilerinin sürekli kaygı (B = -.26, SE = .04, %95 GA [-.35, -.17], β = -.28, p = .00) ve sürekli kaygının önemli bir yordayıcısı olduğunu gösterdi. kaygı, gecikmelerin önemli bir yordayıcısıdır (B = .20, SE = .06, %95 GA [.08, .32], β = .17, p = .001). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri hala anlamlı bir tahmindi ancak tahmin gücü azaldı, bu nedenle kısmi aracılık sonuçlarıyla tutarlıydı (B = -.31, SE = .06 , %95CI [-.42, -.19], β = -.26, p = .00). Sürekli kaygının güvenlik becerileri ve hatalar arasındaki potansiyel aracılık rolü için dördüncü aracılık analizi yapıldı. Sonuçlar, güvenlik becerilerinin hataların (B = -.26, SE = .04, %95 GA [-.35, -.17], β = -.28, p = .00) ve sürekli kaygının önemli bir yordayıcısı olduğunu gösterdi. hataların önemli bir tahmincisiydi (B = .19, SE =.07, %95 GA [.06, .32], β = .14, p = .005). Bu ilişkiye ek olarak, arabulucunun istatistiksel etkisi kontrol edildikten sonra, güvenlik becerileri artık tam aracılık ile tutarlı olan hatalar için önemli bir öngörücü olarak bulunmamıştır (B = -.32, SE = .06, %95 CI [-.44, -.20], β = -.26, p = .00). Sürekli kaygının güvenlik becerileri ve sonuç davranışları arasındaki potansiyel aracılık rolü için sıradan ihlaller ve saldırgan ihlaller için diğer aracılık analizi de yapılmıştır. Önerilen bu modeller için sürekli kaygının herhangi bir aracı rolü bulunmamıştır, bu nedenle test edilen bu modeller bu bölümde rapor edilmemiştir.

3.2. Model Testi (Araştırma Sorusu 3)

Tüm aracılık analizleri sonunda tüm değişkenlerin dahil edildiği araştırma sorusu 3'te önerilen model testi yapılmıştır. Bu model, sürüş bilişleri ile katılımcıların kaygı düzeyleri, becerileri ve davranışları arasındaki anlamlı ilişkiler için test edilmiştir. Model, AMOS-SPSS programı ile test edilmiş ve analiz sonucunda anlamlı bir sonuca ulaşılamamıştır.

DÖRDÜNCÜ BÖLÜM

Tartışma

4.1. Genel Tartışma

Öncelikle aracı değişken testlerinin benzer sonuçlar verdiği belirtilmelidir. SDÖ'nün ihlal faktörü için anlamlı bir sonuç elde edilmemiştir. Bu, hem algısal-motor beceriler hem de güvenlik becerileri ile ilişkisi için geçerlidir. Öncelikle trafikte yaşanan kazalar, panik veya sosyal kaygılar genel olarak araç kullanma kaygısının bir göstergesi olarak değerlendirilebilir (Ehlers ve ark., 2007). Ayrıca yine hatalar, gecikmeler veya kaygı performans eksiklikleri genellikle bilinçsiz bilişsel süreçlerin etkisiyle oluşan kasıtlı ve kasıtlı bir motivasyon içermez (Clapp ve ark., 2011; Özkan ve Lajunen, 2006). Bu durum genel kaygı işleyişine benzer ve bu nedenle özellikle beceri ve yetenekleriyle ilgili kişilerin kafasında soru işareti olduğunda bulguların bu yönde olması şaşırtıcı değildir (Shanar, 2009).
Ayrıca gençlerin beceri ve yetenekleri konusunda özgüvenlerinin yüksek olduğunu düşünenlerin genellikle ihlal yaptıkları bilinmektedir, ancak bu çalışmada incelenen grup kendilerine aşırı güvenmediğinden ihlallere ilişkin herhangi bir sonuç olmaması şaşırtıcı olmayabilir (Martinussen, Hakamies-Blomqvist, Moller, Özkan ve Lajunen, 2013).

Aracılık analizlerinin önemli kalıplarına ilişkin bu genel yorumdan sonra, ayrıntılı sonuçlar üzerinde daha ayrıntılı yorumlar yapılabilir. İlk olarak, araştırma sorusu 1, algısal-motor beceriler ve kaza-panik ile ilgili endişeler için test edildi. Kaza-panik ile ilgili endişeler, algısal-motor beceriler ve sürüş davranışları arasındaki olası ilişkilerin aracıları olarak test edildi. Sonuçlar, kaza-panik ile ilgili kaygıların, algısal motor beceriler ile kaygı performans eksiklikleri arasındaki ilişkiye ve algısal motor beceriler ile gecikmeler arasındaki ilişkiye kısmen aracılık ettiğini göstermiştir. Ayrıca, algısal motor beceriler ile abartılı güvenlik davranışları arasındaki ve algısal motor beceriler ile hatalar arasındaki ilişkilere ayrı ayrı kaza-panik ile ilgili kaygılar aracılık etmiştir. Bu bulgulara göre, algısal-

motor becerilerinin iyi olduğunu düşünenler, daha az kaygı performans eksikliğine, abartılı güvenlik davranışlarına, gecikmelere ve hatalara dönüşen kaza paniği ile ilgili daha az endişe bildirmektedir. İkinci olarak, araştırma sorusu 1, algısal-motor beceriler ve sosyal kaygılar için test edilmiştir. Sosyal kaygıların aracılık etkisi taranmış ve algısal-motor becerilere sosyal kaygıların kısmen ve tamamen hata yapma yolunda aracılık ettiği bulunmuştur. Ayrıca paralel aracılık incelemeleri de yapılmış ve algısal motor beceriler ile kaygı performans açıkları arasındaki ilişkilere kaza panik kaygıları ve sosyal kaygıların aracılık ettiği bulunmuştur. Aslında bu bulgu önceki paragrafta açıklanan bulgularla uyumludur. Nasıl ki bir kişi gençken farkındalığı düşük olduğunda ve sürüş yeteneklerine inandığında, bir kazaya karışma veya kaza yapma olasılığının daha yüksek olduğunu düşünür. durumu kontrol eder (Martinussen ve diğerleri, 2013). Aksi takdirde, diğer grup daha fazla kaza yapmaktan veya becerileri kötü olduğunda diğer insanların benim hakkımda ne düşüneceğinden korkacak ve bu da hata yapma olasılığını artırabilecektir (Ehlers vd., 2007; Shanar, 2009).

Güvenlik becerileri de aynı teknikle tarandı ve araştırma sorusu 1, algısal-motor beceriler ve kaza-panik ile ilgili endişeler için test edildi. Güvenlik becerileri ve kaygı performansı eksiklikleri, güvenlik becerileri ve gecikmeler ile güvenlik becerileri ve hataları arasındaki ilişkilerin kısmen kaza-panik ile ilgili kaygıların aracılık ettiği bulunmuştur. Bunlara ek olarak, kısmen güvenlik becerileri için araştırma sorusu 1 ile ilgili sosyal kaygılar için de aynı sonuçlar bulunmuştur. Ayrıca, benzer bir çizgiyle, kaza paniği ile ilgili kaygılar için paralel aracılık ve güvenlik becerileri ile kaygı performans eksiklikleri arasındaki ilişki için sosyal kaygılar paralel aracılar olarak bulunmuştur. Bu bulgular, güvenlik becerilerinin algısal motor becerilerle pozitif yönde ilişkili olduğunu göstermekte ve bu eksende sonuçlar vermektedir. Literatürde önerilen ilişki (örn. Sümer, Özkan ve Lajunen, 2006), bu çalışmada algısal-motor beceriler ve güvenlik becerileri aynı şekilde çalıştığı için bu bulgular şaşırtıcı değildir. Genel olarak güvenlik becerilerinin daha iyi olduğunu düşünen kişiler, sürüş kaygısını tetikleyen düşüncelerin daha azına sahiptir ve bu durum daha az kaygı performans açıkları, gecikmeler ve hatalara dönüşmüştür.

Bu çalışmada da hem durumluk hem de sürekli kaygının aracılık etkileri sınanmıştır, diğer yandan araştırma sorusu 2'ye ilişkin durumluk kaygı için herhangi bir etki bulunamamıştır. Bu ilişkinin bulunamamasının temel nedeni, durumluk kaygının sürüş ortamı için tam olarak ölçüm sağlanmamıştır. Bu çalışmada araç kullanırken bu ölçümün yapılması daha gerçekçi sonuçlar vereceğinden bu ölçeğin bu çalışma için çalışmadığı düşünülmektedir. Ancak durumluk kaygıda elde edilen sonuçlar sürekli kaygı alt ölçeği için geçerli değildir. İncelenen aracı etki olan sürekli kaygının çeşitli ilişkilerde aracı olduğu tespit edilmiş olup, bu bulgular hem literatür hem de önceki aracılık analizi ile tutarlıdır. Bu çalışmada kaygı düzeyi için yapılan ilk denemelerde, sürekli kaygının öncelikle algısal motor beceriler ile gecikmeler arasında ve algısal motor beceriler ile kaygı performans eksiklikleri, algısal motor beceriler ve hata arasında aracı bir değişken olduğu bulunmuştur. Araştırma sorusu 2'nin iki değişkeni arasında, algısal motor becerilerinin yüksek olduğunu söyleyen sürücülerin daha az sürekli kaygı sergiledikleri ve bunun sonucunda daha az kaygı performans eksikliği, gecikme ve hataya dönüştüğü bulunmuştur.

Benzer testler diğer bağımlı değişkenler için de yapılmıştır ve araştırma sorusu 2 de sürekli kaygı ve güvenlik becerileri için test edilmiştir. Güvenlik becerilerinin, düşmanca davranışlar için sürekli kaygı ile aracı rol oynadığı, ayrıca kaygı performans eksiklikleri ve hatalar için aracı değişken olduğu bulunmuştur. Daha önce yapılan sürekli kaygı ve SDA çalışmalarında, sürekli kaygının tüm SDA alt ölçeklerini yordadığı bulunmuştur. Ancak bu çalışmada olduğu gibi daha çok hata ve gecikmelerle ilişkili bulunmuştur. Bu nedenle doğası gereği kişinin işleyen bellek kapasitesini tüketen sürekli kaygının hata ve gecikmelerle ilişkili olduğunu bu modelde test etmek mantıklıdır (Shahar, 2009). İlişkinin diğer yüzü olan beceri ve sürekli kaygı bağı da genel kaygı mantığı ile tahmin edilebilir. İnsanların kendi becerilerine olan güvenleri ile sürekli kaygı arasında çok fazla ilişki bulunmamakla birlikte, spor araştırmalarında trafik için bu durum tam tersi olabilir (Hanton, Evans ve Neil, 2001; Voight, Callaghan ve Ryska, 2000). Bu durum her gün kullandığımız yollarda farklı olabilir ve trafikte tıpkı yaşlı sürücülerde olduğu gibi yeteneklerine güvenen kişiler tarafından sürekli kaygı tetiklendiğinden genel

popülasyonda daha fazla hataya neden olabilir (Azik, 2015; Taylor, 2018). Ancak bu ve benzeri aracılık analizleri ve modelleri daha önce test edilmediğinden ve çok araştırılan bir konu olmadığından, bu bulguların tam olarak anlaşılabilmesi için tekrar edilmesi gerekmektedir.

Seri arabuluculuk analizlerinin yanı sıra, Araştırma Sorusu 1 ve 2'de önerildiği gibi becerilerde ve anormal ve endişeli sürüş davranışları bağlantılarında sürüşle ilgili endişelerin ve kaygının paralel aracı rolleri test edildi, ancak Araştırma Sorusu 3 için anlamlı bir model sonucu bulunamadı. Bunun en önemli nedeni, bu çalışma örnekleminde durumluk kaygı alt ölçeğinin çalışılamamış olması ve sürekli kaygı maddelerinin yarı yarıya düşmesi olabilir. Özellikle ilişki daha karmaşık hale geldikçe, ölçümle ilgili olası sorunlar bu model test sonuçlarını etkilemiş olabilir. Gelecekteki çalışmalarda, endişeli sürüşe özgü önlemlerin geliştirilmesi ve çalışmanın farklı örneklerle tekrarlanması, daha önce bilinmeyen birçok bağlantının gün ışığına çıkarılmasına yardımcı olabilir.

4.2. Çalışmaya İlişkin Eleştirel Açıklamalar ve Gelecek Araştırmalar İçin Öneriler

Bu çalışma, trafik ortamlarında endişeli endişeler ve endişeli olma bağlamında sürücü becerileri ve sürüş davranışlarını birleştiren ilk çalışmadır. Çalışma, sınırlı bir popülasyon yerine özellikle genel popülasyonla çalışılmasıyla fark yaratmaktadır. Örneklemi ve bu modellerin işe yaradığını görmek aslında trafik koşullarında kaygının yerini ve önemini vurgulamaktadır. Ayrıca sonuçlara göre, anlamlı aracılık analizleri sonuçlarına ihlallerden ziyade hatalar ve gecikmeler dahil edilmiştir. Sapkın davranışların iki alt grubu olan hata ve kusurlar, trafik güvenliğine ilişkin ihlaller kadar tehlikeli olarak algılanmamıştır. Karayolu trafiğine yeni alışmış, bir hastalık ya da yaştan kaynaklanan ya da bir şekilde sakatlık yaşayan ya da sadece o an için karmaşık ya da stresli bir hayat yaşayan ve günlük kaygılarının bir sonucu olarak, insanların yollara çıkabileceğinden bahsedilmektedir. ayrıca hatalar ve gecikmeler yapar. Sürekli kaygı için anlamlı sonuçlar bulunmuş gibi görünse de bu çalışmada dikkat edilmesi gereken bazı

kritik noktalar vardır. Öncelikle burada sürekli kaygı ölçümü yapıldığı söylense de, ölçme aracı maddelerine odaklanıldığında bu çalışmada kullanılan ölçüm bir kişilik özelliğinden ziyade kaygılı hissetme çerçevesindedir. Başka bir deyişle, insanların sürekli olarak (özellik maddeleri) veya durumsal olarak (durum maddeleri) ne kadar kaygı duygusu yaşadıkları şeklinde yorumlamak daha doğru olabilir. "Uyarılma hassasiyeti" tanımı, hat ölçüm çerçevesi için daha uygun olacaktır. Bu nedenle burada yapılan ve sonuçları olan sürekli kaygının, genel olarak insanların duygularını deneyimledikleri şeklinde yorumlanması gerektiğine dikkat edilmelidir. önceki çalışmalarda. Ancak bu çalışmada bu değişkenlerin genel nüfusla ne kadar ilişkili olduğu, ne kadar yaygın olduğu ve ana sürücü eylemleri dediğimiz sürüş becerileri ile ilgili yargıları ve sürüş davranışlarını ne kadar etkilediği ortaya konmuştur. Bu çalışma sonucunda 2 yeni ölçek (SBYA & SDÖ) Türkçe'ye çevrilmiş olup, bir ölçek (DSKA) yeniden incelenip güncellenecektir. Ve böylece bu konunun kültürler arası olarak nasıl değişebileceğine dair bir araştırma adımı tamamlanmış oldu.

Ayrıca bu çalışmada ilk kez kaygılı sürüş davranışları (SDÖ) ve sapkın sürüş davranışları (SDA) tek bir çalışmaya eklenmiş, sonuçlar ve model bu çerçevede değerlendirilmiştir. Sonuçlar içerisinde değerlendirildiğinde, özgün olarak farklı kavramlar için geliştirilmiş olan bu riskli davranış ölçüm araçlarının birbiriyle ilişkili ve ilgili sonuçlar çıkarması ve birbirini desteklemesi, geliştirilen bu araçların gücünü ve geçerliliğini ortaya koymaktadır. Bu nedenle bu çalışmanın sonuçları, alanda kullanılan ölçme araçlarının gücünü de ortaya koymaktadır.

Bu çalışma, trafik güvenliği için literatürde parça parça bulunan bilgilerin birleştirilmesi ve bir ilişki döngüsü içinde değerlendirilmesi olarak görülebilir. Genel popülasyon bazında birbiriyle ilişkili olduğunu bildiğimiz veya varsaydığımız bazı değişkenleri test etme imkanı bulduk. Bu bağlamda, daha önce bu kapsamda herhangi bir model veya araştırma yapılmadığı için önemi net olmayan kaygı ve sürüş kaygısının trafik güvenliğinin sağlanması önem arz etmektedir. Bu nedenle, bu mevcut çalışmanın yardımıyla, hem sürücüden kaçınan grupların hem de daha fazla sürüş hatası ve hatası olan grupların hareketliliğini artırmak için toplum ve politika yapıcılar ve eğitimciler tarafından sürüş sırasındaki kaygının daha iyi anlaşılması sağlanabilir. Ayrıca, yeni sürücüler,

ayrımcılığa uğrayan kadınlar veya herhangi bir nedenle yeteneklerinde azalma olan diğer sürücüler gibi sürücüleri anlamaya ve rahatlatmaya dayalı müdahalelerin ilk ayağı bu çalışma bulguları ile sağlanabilir. Genel olarak riskli grup için her zaman iyi ve güvenli bir ortam sağlamak gerekirken zaman zaman daha güvenli sürücü gruplarına da fayda sağlamak gerekir. Bu çalışmada bu amaca hizmet edilmiştir.

Mevcut çalışmanın tartışılması gereken bazı kritik sorunları var. Bahsedilmesi gereken ilk ve temel şey, bu çalışmanın verilerinin Covid 19 pandemisinin başlangıcında toplanmaya başlanmasıdır. Covid 19 pandemisinin 2020-2022 yılları arasında geniş çaplı bir sokağa çıkma yasağına ve özellikle insanların hastalığın nasıl ilerleyeceğini bilmemeleri nedeniyle genel kaygıda artışa neden olduğu bilinmektedir (Kan ve ark. 2021). Ayrıca insanların araç kullanma tepkilerine tepkilerini etkileyecek bu süreçte evde kalmaları nedeniyle trafik ortamında çok aktif olamamaktadır. Bazı araştırmalar, hız yapma, telefon kullanma veya daha ağır ihlaller gibi bazı davranışların Covid-19 Pandemisi sırasında yoldayken miktar ve sıklıklarında artış olduğunu ortaya koymuştur (Katrakazas, Michelaraki, Sekadakis ve Yannis, 2020). Kuşkusuz, pandeminin başlangıcında veri toplanması, sonlara doğru toplanmasından daha iyi sonuçlar verdi. Ancak bu çalışmanın temel değişkenlerinin trafik ortamı ve genel toplum kaygısı ile ilgili olduğu düşünüldüğünde bir süre sonra hastalığın etkileri azaldığında tekrar ölçümler yapmak ve bu sonuçları diğer literatür bulgularıyla karşılaştırmak uygun olacaktır.

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