INVESTIGATION AND COMPARISON OF HUMAN FACTORS IN DRIVING
AND ATTITUDES TOWARDS DISABLED DRIVERS: A STUDY WITH
DISABLED AND NON-DISABLED DRIVERS

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ABSTRACT

INVESTIGATION AND COMPARISON OF HUMAN FACTORS IN DRIVING AND ATTITUDES TOWARDS DISABLED DRIVERS: A STUDY WITH DISABLED AND NON-DISABLED DRIVERS

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The current study firstly aimed to develop an attitude scale to measure attitudes towards disabled drivers in traffic environments (Study-1). During development of the scale process, to gain knowledge about disabled driving semi-structured interviews were conducted with 28 active drivers (12 disabled drivers, 16 non-disabled drivers). Interview results were analyzed and results provided a basis for the development of 'Attitudes towards disabled drivers scale (ADDS). After that, in the main study, it was aimed to understand human factors of disabled drivers and attitudes of disabled and non-disabled drivers towards disabled driving. 189 disabled drivers and 349 non-disabled drivers were participated to the study. In order to measure drivers' evaluation of self-driver behaviors and other group's driver behaviors, Turkish version of Driver Behavior Questionnaire (DBQ) adapted by Lajunen & Özkan (2004) and The Positive Driver Behaviors Scale developed by Özkan & Lajunen (2005) were applied to both

groups of drivers. Similarly, to measure drivers' evaluation of self-driving skills and other group's driving skills, Driver Skill Inventory (DSI) developed by (Lajunen & Summala, 1995) was applied to both groups of drivers. Lastly, to test both disabled drivers' and non-disabled drivers' attitudes towards disabled driving newly developed scale (ADDS) was used. The results of the Study-1 and Main study will be discussed in detail.

Keywords: disabled drivers, non-disabled drivers, attitudes towards disabled driving, human factors in driving

ÖZ

SÜRÜCÜLÜKTE İNSAN FAKTÖRLERİNİN İNCELENMESİ VE KARŞILAŞTIRILMASI VE ENGELLİ SÜRÜCÜLERE YÖNELİK TUTUMLAR: ENGELLİ SÜRÜCÜLER VE ENGELSİZ SÜRÜCÜLER İLE BİR ÇALIŞMA

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Bu çalışmanın amacı ilk olarak trafikte engelli sürücülere yönelik tutumu ölçmek ve belirlemek amacıyla bir tutum ölçeği geliştirmektir (Çalışma 1). Tutum ölçeği geliştirme sürecinde engelli sürücülükle ilgili bilgi edinmek amacıyla yarı yapılandırılmış mülakatlar düzenlenmiştir. Çalışmaya 12 engelli sürücü, 16 engelsiz sürücü olmak üzere toplam 28 aktif olarak araç kullanan sürücü katılmıştır. Mülakat sonuçları nitel analiz yöntemiyle analiz edilmiş; bu sonuçlar 'Engelli Sürücülere Yönelik Tutum Ölçeği (ESYTÖ)' geliştirme sürecine temel sağlamıştır. Ana çalışmada ise engelli sürücüler sürücülükte insan faktörleri açısından litertürde ilk defa incelenmiş ve trafikte engelli sürücülüğe yönelik tutumları ölçmek amacıyla hem engelli sürücülerden hem de engelsiz sürücülerden very toplanmıştır. Çalışmaya 189 engelli sürücü 349 engelsiz sürücü olmak üzere toplam 538 aktif olarak araç kullanan

sürücü katılmıştır. Sürücülerin kendi sürücü davranışlarını ve diğer grubun sürücü davranışlarını değerlendirmesi amacıyla Lajunen ve Özkan (2004) tarafından türkçeye adapte edilen 'Sürücü Davranışları Ölçeği (SDA)' Özkan ve Lajunen (2005) tarafından geliştirilen 'Pozitif Sürücü Davranışları Ölçeği' eklenerek 37 maddde halinde kullanılmıştır. Yine sürücülerin kendi sürücü becerilerini ve diğer grubun sürücü becerilerini değerlendirmesi amacıyla ise Lajunen ve Summala (1995) tarafından geliştirilen 'Sürücü Becerileri Ölçeği (SBE)' kullanılmıştır. Son olarak hem engelli sürücülerin hem de engelsiz sürücülerin engelli sürücülüğe yönelik tutumlarını ölçmek amacıyla çalışma 1'de geliştirilen 'ESYTÖ' ile her iki sürücü grubundan da very toplanmıştır. Çalışma 1 ve ana çalışma bulguları, çalışmanın literature katkıları ve çalışmanın kısıtları ilgili literatür ışığında detaylı bir şekilde tartışılmıştır.

Anahtar Kelimeler: engelli sürücüler, engelsiz sürücüler, engelli sürücülüre yönelik tutum, sürücülükte insan faktörleri

TO MY PARENTS; FATMA & ALİ

and

TO YAVUZ

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CHAPTER I

INTRODUCTION

1.1 Overview

Road traffic accidents are one of the major causes of death and injury all over the world. In global terms, about 1.2 million people die in traffic accidents each year especially in low and middle income countries (WHO, 2015). It is also emphasized in the World Health Statistics 2015 report that these accidents can be predicted and prevented by proper regulations done by governments. In Turkey, reports of the General Directorate of Security Affairs which were based on tachometer data indicated that there were 1.313.359 recorded accidents in 2015. In these accidents, 304.421 of the victims were injured, 7.350 of them were killed either outright at the accident or in hospitals.

While the road environment of a country, road engineering and vehicle are some critical key factors for traffic safety, any possible outcome in traffic results from contribution or interaction of the human factor and other factors like vehicle characteristics and driver group characteristics (Özkan, 2006).

In the literature, human factors in driving were studied with different groups like young drivers-old drivers, male drivers-female drivers etc. but physically disabled drivers haven't been studied yet. Disability is another factor in traffic environments because disabled drivers are active participants of traffic settings. However, there is not enough knowledge and understanding about the human factors of disabled drivers and attitudes towards their presence in the traffic environments. For this reason, in this study, it is an aim to understand human factors in driving for disabled drivers with the perspective of this group of drivers.

1.2 Human Factors in Driving: Driver Behaviors (Driving Style) and Driving Skills (Driver Performance)

Driver behaviors and driving skills are two major components of human factors in traffic environments. While driver behaviors are related to a driver's choice about how to drive, driving skills are all about 'the best' that a driver can do in traffic (Elander, West, & French, 1993). In years, driver behaviors and driver performance have been studied under the consideration of many individual related factors like age, gender, experience, personality characteristics and at different settings like occupational ones in the literature. Human factors are introduced as one of the important elements of traffic culture in these studies. Oppenheim and Shinar (2011) defined human factors or ergonomics behavioral aspects of road users in terms of the physical, physiological, cognitive, personal and social interaction with vehicle and road environments. Moreover, they pointed out that despite the main role of a road user in driving activity, isolation from the environment and vehicle features cannot be possible in traffic settings. In relation to the human factor and traffic environments, driver behaviors (driving style) and driving skills (driver performance) have been mentioned as two components of human factors in traffic settings.

1.2.1 Driver Behaviors: Errors, Lapses &Slips Violations and Positive Driver Behaviors

In literature, human factor was studied mostly in relation to the human error in accident investigation studies. These studies some of which include the schema activation error model (Norman, 1981), model of human malfunction (Rasmussen, 1986) and generic error modeling (Reason, 1990) considered especially individual level errors. In traffic environments, as Evans (1991) mentioned, human factor is perceived as the major cause of 85-90% of road accidents. This means that in most traffic accidents, the sole factor was not the vehicle failures, but the human factor. Driver behaviors are major components of these human factors. Elander and colleagues (1993) defined driver behaviors as being a person's choice or habit about how to drive. For this reason, researchers claimed that driver behaviors are affected from a person's attitudes and

belief about the driving task and her/his common needs and point of view. As for another definition done by Lajunen and Özkan (2011), driver behaviors are defined as preferences of the driver for everyday driving habits of her/him.

Based on studies providing evidence for the association between driver behaviors and accident involvement, to measure driver behaviors, Reason, Manstead, Stradling, Baxter, & Campbell (1990) developed the Driver Behavior Questionnaire (DBQ). DBQ is mostly used to measure driver behavior on traffic by presenting a self-report measurement style. It focuses on aberrant behaviors of drivers in traffic environments. Reason and colleagues (1990) firstly introduced factor structure of DBQ as two factors which were as errors and violations. Researchers claimed that despite originating from different psychological roots and requiring different improvement techniques, violations and errors are characterized as the two essential aberrant behaviors. Violations are described as deliberately doing inappropriate actions. Contrary to violations, errors include appropriate intention, but a failure at the end of the action. In more specific terms, errors represent failure in the actualization process of planned behavior, so the desired outcome is not reached (Reason et al., 1990). Because errors could have different underlying mechanisms, Reason and colleagues (1990) described 'slips and lapses' as the third factor of DBQ. They categorized 'slips and lapses' as skill based errors which result from driver actions. 'Slips and lapses' represent unintentional aberrance of planned action from the intention which is caused by action slips or memory failures. Lawton, Parker, Manstead, & Stradling (1997) extended the violations factor by adding new items to the scale. The new factor analysis showed that there should be two scales for violations because violations were differentiated based on the drivers' reason to violate. According to this distinction, while aggressive violations were defined as deliberately and aggressively violating safety rules, ordinary violations were defined as violating the rules without aggression intention.

In the first introduced version of DBQ, Reason and colleagues (1990) defined two empirically different driver behaviors which were errors and violations. These classes of behaviors were composed of three factors named as 'deliberate violations',

'dangerous errors' and 'silly errors'. In the literature, many new attempts have been done so as to define factorial structure of the DBQ. By investigating related literature, it can be concluded that the replication of three-factor structure (error, lapses, and violations) and four factor structure (errors, lapses, aggressive violations and ordinary violations) of DBQ had different concerns. Despite several factorial structures (2 to 6) and item numbers (24 to 114), violations and errors were found as two consistent factors of DBQ measurement by a three-year follow-up research done in Finland (Özkan, Lajunen, & Summala, 2006a). In Turkey, DBQ was introduced as being a four factors structure with errors, lapses, ordinary violations and aggressive violations (Lajunen & Özkan, 2004). Similarly, Sweden samples of drivers confirmed the errors and violations factors of DBQ. In addition to this expected finding, in this study, researchers divided lapses into two parts as inattention errors and inexperience errors (Aberg & Rimmo, 1998). On the other hand, in Australia, Stephens and Fitzharris (2016) conducted a study to analyze the construct validity of DBQ. The study was performed with 2771 drivers between the ages of 18 to 75. A 28-items version of DBQ was used. A four-factor-structure (errors, violations, aggressive violations and lapses) with 28 items was found as having the best fit with Australian drivers. In another study, Lajunen, Parker, & Summala, (2004) conducted a study to find whether the factor structure of DBQ introduced by Reason et al. would be fit for drivers in Britain, Finland, and the Netherlands. The results of the study pointed out that using a four-factor structure was appropriate for DBQ which was translated into Finnish and Dutch languages. In another study conducted in Romania, DBQ which represented cross-cultural properties were applied to emerging and young adults (19 to 33 years old). Despite the presence of studies confirming the factorial structure of previous versions of DBQ in Romania, this study was aimed to investigate cross-cultural version of it. According to the study results, the DBQ with a four factor structure which was verified in Great Britain, Finland and the Netherlands was found as valid and reliable to measure driver behaviors of Romanian drivers as well (Sarbescu, 2013). Lastly, Marinussen, Hakamies-Blomqvist, Moller, Özkan, & Lajunen (2013) aimed to test the differences between errors and violation factors which differed in many cultural

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studies and develop a cultural version of DBQ for drivers in Denmark. Three and four factor structures were found as the best solutions for Danish drivers. The researchers proved that firstly it is important to detect aberrant driving behaviors of drivers in one culture. Then, the factor structure of DBQ which is decided according to the cultural properties present in a country can give an idea about where necessary actions and interventions should be planned.

In the literature, there are many cross-cultural studies which investigated and evaluated DBQ in different ways. There were attempts to define cross-cultural properties of DBQ as well as attempts for development of culturally adapted versions. Lajunen and colleagues (2004) reported that countries have unique traffic environments, e.g., the sounding of a horn's represens-aggression in Scandinavia, but not in Southern Europe because of a lower level of horn threshold. It was pointed out that while adding nationally meaningful items, some culturally specific items might be removed from the original version of DBQ. This enables to include both the previously developed items for cross-cultural studies and the new items for national usage (Lajunen, et al., 2004). For example, Warner, Özkan, Lajunen, & Tzamalouka (2011) demonstrated that Finnish, Swedish, Greek and Turkish drivers had different rating scores for the 26 items of DBQ out of 28 items. These differences showed that in Greece and Turkey, drivers reported more aggressive violations and ordinary violations than drivers in Finland and Sweden. Furthermore, nine key items which have different ratings for each country were specified. Other than errors, both aggressive and ordinary violations and lapses were present in these nine items. According to self-reports of drivers from these four countries, Finnish and Swedish drivers' accident involvement was not explained by any of the items. On the other hand, accident involvement of Greek and Turkish drivers was explained by one and two items respectively. It can be deduced from these results that DBQ can detect culturally specific aberrant driving behaviors and help make progress in safety precautions.

All versions of DBQ take into account the aberrant behaviors, but in traffic environments there are also some behaviors with positive intentions. Based on this

fact, Özkan, & Lajunen (2005) defined positive driver behaviors as being performed to protect traffic environments and other road users or to approach them thoughtfully and helpfully. Moreover, the underlying reasons for these behaviors may or may not be related to the safety concerns of drivers. On the basis of these assumptions, to have a reliable measurement technique for 'positive' driver behaviors, the researchers developed 'the Positive Driver Behaviors Scale'. It was asserted there was a positive correlation between positive driver behaviors and age and exposure. This was because novice drivers' need for being more careful about driving activity was a priority when compared to secondary behaviors like being polite to other road users. Moreover, researchers proved the negative association between errors and violations factors and positive driver behaviors. The reason for this negative relation is explained by either the characteristic features of a polite driver (e.g. carefully observing the situations in traffic and not annoying other road users) or positive driver behaviors' falling behind the most demanding traffic situations (e.g. like handling the car). There were different studies using the Positive Driver Behaviors Scale for different groups of drivers. For example; Öz, Özkan, & Lajunen (2013) conducted a study by adding positive driver behaviors to negative behavioral DBQ elements of violation and errors. The aim of the study was to investigate whether safety concerns of professional drivers were represented by positive or negative driver behaviors based on organizational safety climate. It was concluded that if the organization gave importance to safety rules and regulations regardless of the time pressure effect, and humans were the major factor for the work load, violations and errors were reported less by professional drivers. However, there was not any relationship between the safety climate of transportation companies and positive driver behaviors. On the other hand, another study performed by Öz, Özkan, and Lajunen (2014) to find out the relationship between trip-focused organizational safety climate and errors, violations and positive driver behaviors achieved to prove the relationship between organizational safety climate and positive driver behaviors for the first time.

1.2.2 Driving Skills (Driver Performance): Perceptual Motor Skills & Safety Skills

As Summala (1987) argued, the skills during a driving activity can be investigated at hierarchical levels. The levels of hierarchy were explained in studies (i.e. Johannsen & Rouse, 1979; Michon, 1985; Summala, 1987, Van der Molen & Botticher, 1988) as control (operational), maneuvering (guidance) and planning (navigational). Summala (1987) explained the improvement of driving skills as the transition from the bottom (control) level to the top (planning) one. The researcher stated that at the beginning of this process, the driver should learn the basics of car usage and have fluent skills in terms of both the usage of car and meeting the requirements of driving (e.g. using brake, accelerator or clutch, steering the car and understanding its response to the drivers' control). The transition between levels starts with practice and exposure. It means that motor skills started to develop and an automated car control was developed incrementally. However, there were time differences between the development processes of skills. For example, while basic motor skills could be improved in a shorter span of time, perceptual skills could require more time.

Spolander (1983) considered driving skills as technical driving skills and defensive driving skills of drivers. The difference between technical and defensive driving skills was explained by saying that while technical driving skills are about fluent car control and management strategies in traffic, defensive driving skills were all about anticipatory accident avoidant skills. In general terms, driver performance represents the level of performance for drivers to complete a driving task. Controlling the car on the road and hazard detection can be said as essential elements of this process. This can be explained by the fact that motor skills and safety skills are crucial parts of driver performance (Elander et al, 1993). Based on 1300 drivers' self-evaluation, Spolander (1983) stated that drivers reported stronger driving skills when they become experienced in driving. However, it was pointed out that there were gender differences for this situation. It is concluded that male drivers tend to evaluate their driver performance as better than their actual performance. Moreover, starting from the first

year of getting a driving license, there is an increase in this overstatement of male drivers.

By considering the driving skills, an instrument with 13 items was developed by Spolander (1983). In this scale, drivers were asked to evaluate their driving skills with respect to 'the average driver'. Contrary to the external criterion base of that instrument, Hatakka, Keskinen, Laapoti, Katila, & Kiiski (1992) used an internal reference point and asked drivers to evaluate their own performance according to its weak and strong properties. Two original factors proposed by Spolander (1983) corresponded with the study factors of Hatakka et al. (1992). Afterwards, Lajunen & Summala (1995) conducted a study by extending the scale content of Hatakka and colleagues (1992). In that study, they pointed out that the two factor structure of Hatakka and colleagues' scale was not tested previously by Spolander. In addition to testing the factor structure of Hatakka et al.'s scale, Lajunen and Summala drew attention to the relation between a driver's safety motives and his/her actual driving performance. Consequently, Lajunen and Summala (1995) developed the Driver Skill Inventory (DSI) as a self-reported technique to measure both perceptual motor skills and safety skills of drivers by verifying two factor structures. While perceptual motor skills are defined as being related to the technical ways of driving, safety skills are related to the driver's safety precautions and personal attitudes during driving. Moreover, they gave importance to the evaluation of safety skills because they claimed that a driver's internal reference about her/his safety skills may affect actual driving style of that driver.

The general factor structure of DSI was defined as two-factor. In many countries such as Australia (Lajunen, Corry, Summala, & Hartley, 1998) and the UK (Lajunen, Parker & Stradling, 1998b), translated versions of DSI were studied and a two-factor solution was found appropriate for these cultures. On the other hand, Özkan, Lajunen, Chliaoutakis, Parker, & Summala, (2006b) showed although safety skills and its factorial structure are congruent for drivers in Great Britain, Finland and the Netherlands. It is not congruent for Greece, Iran and Turkey despite the high similarity

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of factor structure for perceptual motor skills. The reason behind this difference was explained by saying that countries might have different cultural values in terms of safe driving. Aggressive violations and low social tolerance were defined as basic components of these three countries' traffic environments. For this reason, core items of DSI did not work for the drivers living in these countries. The reason behind this discrepancy was explained as originating from possible interpersonal conflicts confronted in the traffic settings of these countries. This study proved that although there has been a unique factor structure for DSI in many countries, safety skills can show a change especially in Southern Europe and Iran. For this reason, to get knowledge about the nature of safety skills and local features of it in different cultures, researchers pointed out the necessity of using 'nation-specific safety skills' together with 'core DSI items' in DSI.

1.2.3 Factors Related to Driver Behaviors and Driver Performance: Age, Sex, Exposure

In the literature, different factors like age (Rimmö & Blomqvist, 2002; Williams, 2006), sex (Rimmö, 2002; Bener et al., 2013), exposure (Mourant & Rockwell, 1972; Roman, Poulter, Parker, Mckenna, & Rowe, 2015), personality traits like sensation seeking or risk taking (Constantinou, Panayiotou, Konstantinou, Ladd, & Kapardis, 2011; Lucidi, Mallia, Lazuras, & Violani, 2014) and occupational and organizational/national culture (Öz et al.,2013; Öz et al., 2014) have been studied in depth in relation to driver behaviors and driving skills in traffic environments. In the next sessions of this thesis study, age, gender, exposure and their relation to driving activity will be examined in detail as critical human factors. This is due to the fact that in the literature, there were many studies proving the relationships between age/gender/annual kilometer and accidents/driver behaviors/driving skills. For example, Perepjolkina and Renge (2011) proved that being a male driver, young driver and having higher total kilometer in a year combined with the tendency to anger factor of aggressiveness had predictive validity for aggressive driving. Similarly, Blockley, & Hartley (1995) asserted that higher exposure to the road was found as positively

related to violations in traffic. Furthermore, frequencies of dangerous errors and violations were found as higher in younger driver groups compared to older ones. As the last finding of the study, researchers reported that while frequencies of violations were higher in male driver groups compared to female ones, frequencies of errors were higher in female driver groups. Depending on these mentioned relationships between risky individual factors in driving and driving related outcomes the current study aims to investigate human factors in traffic settings by considering age, sex and exposure (i.e., annual kilometer).

Age

Driving activity could be evaluated as well-functioning psychomotor processes so as to be active both physically and mentally during driving (Rimmö & Blomqvist, 2002). When age increases, drivers can feel more pressure about these tasks which need concurrent planning in traffic, and their performance is affected by age related changes of the body (anatomically or physiologically) and mind (cognitively) (Douissembekov, Gabaude, Roge, Navarro, & Michael, 2014). On the other hand, sometimes not only physical and mental changes, but also older drivers' perception of their driving performance could be related to driving experiences of these drivers. For example, Rimmö, & Blomqvist (2002) reported that independent from aging problems, older drivers were found to decrease their driving habits because of active or passive accidents they lived.

McGwin and Brown (1998) asserted that drivers whose ages were under 25 and above 65 were both exposed to higher risk of crash involvement and usually be the responsible part for the occurrence of these crashes. Younger drivers have nearly 15% more true judgmental evaluations than older ones about whether a collision will occur or not. Furthermore, young drivers react more quickly in a situation like sudden collisions in traffic environments (DeLucia, Bleckley, Meyer, & Bush, 2003). On the other hand, accident involvement risk of younger drivers was found to be higher than that of the older ones (Bener et al., 2013). Mourant and Rockwell (1972) reported that, in the United States, young drivers are involved in accidents nearly two times more

than older-experienced drivers whose age is 40 and above. The reasons of this situation were explained by the notion that young drivers exhibit risky behaviors in traffic environments.

Concerning DBQ elements, Yagil (1998) stated attitudes of younger drivers towards traffic rules and regulations were more negative than those of the older ones, so they tended to commit traffic violations more. On the other hand, Parker and colleagues (2000) claimed that older drivers came to confront active accidents when they exhibited lapses or error type behaviors, but younger drivers confronted passive accidents when it comes to lapses. Similar with these results, DeLucia and colleagues (2003) proved that not violations, but errors were responsible for active accidents of older drivers.

Sex

When human factors are under investigation, sex has been one of the popular topics for years. The issue of whether there is a difference between male and female drivers in terms of driver behaviors, driver performance and bases of these differences like gender roles and sex have been a popular issue to explore in years (e.g. Dobson, Brown, Ball, Powers, & McFadden, 1999; Simon & Corbet, 1996; Özkan & Lajunen 2006). While the literature has been especially focusing on male drivers because of their high ratio of accident involvement and display of risky driving behaviors, female drivers have been a part of critical traffic safety researches (Lonczaka, Neighbors & Donovan, 2007). Male drivers were evaluated as having a higher possibility of being injured caused by a traffic accident. This is because men have more cars than women, and their employment rate as professional drivers is higher than that of women's (Bener et al., 2013).

Furthermore, in the literature there were significant differences between male and female drivers in terms of driving skills and driver behaviors during driving activity. Özkan and Lajunen (2006) conducted a study with 131 male and 86 female young drivers in Turkey. The study showed that perceptual motor-skills were specifically

related to being a man and having masculine characteristics. On the other hand, safety skills measured by DSI had higher scores if the driver had a feminine feature tendency. Because both males and females can exhibit masculine or feminine styles, safety skills of male drivers can be shaped and developed by encouraging feminine characteristics like 'caring for others' for their gender roles. Not only driving skills, but also driver behaviors exhibited different features for men and women drivers. Bener and colleagues (2013) conducted a study in Qatar with male and female drivers whose ages were above 20. According to the results, it was implied that males and females involved in an accident with different rates. Male drivers were reported to have two times more traffic accidents as compared to women drivers. Although male and female drivers were not significantly different in terms of DBQ elements (violations, errors and lapses), female drivers were found to be more aggressive than male drivers in Qatar. Lastly, not female drivers, but male drivers tended to use their mobile phones and not obey speed limits while driving.

Exposure

Independent from the age factor, being a novice driver or an experienced driver in any age alters the outcomes in traffic environments. Not age or gender, but the period of time spent driving is important for exposure studies. A study conducted in California proved that novice drivers who were 18 years old and older had the highest crash rates as well as violations especially in the earlier months of getting a driving license. After one year and the following years, the number of crash rates dramatically decreased (Chapman, Masten, & Browning, 2014).

Mccartt, Mayhew, Braitman, Ferguson, & Simpson (2009) claimed that the crash risk of novice drivers from all ages is affected by experience more than age. Regardless of drivers' age, accident risk diminishes depending on the driving experience gained in the earlier practices (Roman et al., 2015). In the literature, there are contradictions as to whether being an experienced driver diminishes accident involvement rate and risky driving or increase high risks. Based on a study run by 13.000 drivers from the USA, Waller, Elliot, Shope, Raghunathan, & Little (2001) claimed that in the first 3 years of

active driving, traffic offences of novice drivers have increased. All of the novice drivers regardless of their gender and age display higher frequencies of ordinary violations and aggressive violations in the first few months of driving as compared to the following times. In another study looking at the progress of driving experience and its relation to drivers' reckless driving habits, Roman and colleagues (2015) stated that frequencies of errors, slips and violations increase based on exposure.

Age & Exposure

Age and exposure studies showed that exposure is different from being old. Underwood (2013) declared both older and younger novice drivers tend to report fewer violations on DBQ evaluations than older experienced drivers. However, accident involvement rate of other groups (novice younger drivers, experienced younger drivers and experienced older drivers) was found to be lower than that of older novice drivers. This contradiction was explained by the fact that older experienced drivers were aware of their previously displayed violations and possible ones in traffic. For this reason, they responded to DBQ items more realistically. In terms of being novice, old novice drivers were found to have two times more accident involvement than young ones. For this reason, old novices and young novices can be mentioned as two different groups. Although after six months, both groups paid more attention to the elements of traffic environment and developed their driving abilities, older novices tended to be more careful than young ones. It was also claimed that during the novice period, experiences of drivers can shape their future decisions and behaviors. At this point, the issue why older novice drivers become more careful in traffic was explained by the fact that they have more frequent near-misses or accident involvement as compared to younger ones.

All the above mentioned factors considered non-disabled driver populations in traffic environments. Although disability is another important human related factor in the area of traffic environment, in the literature, there hasn't been any attempt to investigate human factors in disabled driving and the individual factors being related to disabled driving. Although the number is underestimated, according to reports of traffic authorities, there are 45,942 disabled drivers having class H driving license and

119,758 registered vehicles for disabled drivers in Turkey ('Emniyet Genel Müdürlüğü-Trafik Araştırma Merkezi Müdürlüğü', March 10, 2016). These figures show that understanding the basic on-the-road characteristics of disabled drivers is important. Additionally, their perception of traffic environments, other road users and similarly other road users' perception of disabled drivers should be investigated in order to have a more complete understanding of traffic environments in general. In this study, similarities and differences between disabled drivers and non-disabled drivers were aimed to be investigated.

1.3 Disability

World Health Organization (WHO, 2001) defined disability as being present in a disabled person's life and implies many aspects of that life. The World Report on Disability published in 2011 stated that different forms of disability are seen in 15 people's life out of 100 people in the world. Nearly 4% of these people have remarkable functioning problems.

Disabilities building from health related problems or physical injuries are active problems in terms of physical, mental and emotional well-being of a person. Disability definition states that not only the environmental condition, but also other factors proposed by its elements may handicap the disabled person during his/her life (Altman, 2014). These external factors affect the disabled people's life in practice and their attitude and characterization of disabilities. In the literature, to point out the importance of social factors *people with disabilities* and *able-bodied* terms gave place to the term of disabled and non-disabled (Morris, 1993). In her study Koca-Atabey (2013) explained the importance of cultural and environmental factors based on her real experiences in three different countries; Turkey, the United Kingdom and the USA. She stated that different environments provide disabled people with different social, physical and psychological conditions. For this reason, while disability is a constant term, environment can alter the bringing of life. The results of the study indicated dissimilar inferences for these 3 countries. She concluded that in Turkey, disability is seen as a health problem of the person and it can be solved only by that family.

However, in the United Kingdom, the social duties to solve environmental disabilities outweighed. Lastly, in the USA, the attitude is a blend of the approaches in the previous two countries. Still, the USA is not as consistent as Turkey about the personalization of the disability because in this country, human rights should be respected by every member of the society.

From the social perspective, social concerns and attitudes of people sometimes show a tendency to have negative judgments about disabled people. Many non-disabled people cannot even presume self-help, painless and socially functioning disabled members in society (Lillie, 2001). In this regard, it is important to inform people about disability and make necessary changes in the living area of disabled people. For this purpose, there are important legal policies and regulations about disability in the world. In this manner, Americans with Disabilities Act is one of the important attempts. This legal act appeared in 1990 and for the first time defended disabled people's rights officially. The aim of the policy is to provide rights for disabled people to live in the same social conditions with non-disabled people. Moreover, in this act, it was aimed to prevent possible conditions making life more difficult for disabled people in transportation settings, communication settings and work environments. In general, the important goal of this act was to eliminate prejudices and stereotypes towards disabled people in the society (Johnson & Baldwin, 1993). The second important attempt for disability was 'The Rights of Persons with Disabilities' agreement which was signed by the United Nations. Improvements in the awareness of disability, respect for disabled people in society and preventing discrimination towards disabled people were essential motives of this agreement. The last important example was seen in Turkey in 2011. It was 'Engellilere Yönelik Ayrımcılıkla Mücadele Programı' which came forward to increase disability awareness in the society. All of the above legal policies and social responsibility attempts aimed to protect the rights of disabled people and prevent negative attitudes towards them.

1.3.1 Attitudes towards Disability

An attitude is defined as the evaluation of an object or thought positively or negatively (e.g. 'I do not support usage of guns', 'I love the person near him'). Pratkanis, Turner, & Murphy, (2014) defined attitude as affecting not only branches of cognitive processes, but also inferences, reasoning, perception and finally behaviors of people. Because attitudes are in relation with behaviors in society, forming and changes of attitudes should be investigated in detail in every parts of society (Pratkanis et al., 2014). Chan, Lee, Yuen, & Chan (2002) stated that attitude has three important components; cognitive, affective and behavioral. While building an attitude, these components affect the person's thinking, feeling and behaviors. In this regard, defining attitudes may help understand underlying mechanisms of non-disabled people's behaviors and solve external problems of disabled people. For this reason, it is important to know attitudes towards disabled people in everyday life. In disability literature, there have been many studies performed in different research areas to define and develop positive attitudes towards disabled people. The main areas are educational field, working area and culture and art areas.

First of all, the literature in the field of education can be mentioned with its remarkable disability related studies. Moore and Nettelback (2013) designed a study with the basis of 'Disabled Awareness Program'. In this study, students in the experimental group attended a speech given by a disabled sportsman, watched a documentary about disabled people and were given information about the kinds of disabilities. After all, it was seen that by comparison to the control group, there was development in positive attitudes of these secondary-school students towards disabled people. Both meeting a disabled person and getting knowledge about disability positively changed the attitudes of students towards disabled people. No matter the age of students, similar results were found in many studies. There was another study in which a 12-week camping with disabled people was designed for undergraduate and graduate students. This camping process also had additional education sessions about disability. Results of that study showed that shared time with disabled people was important to change

attitudes towards that group of people during camping process; however, it could not create satisfactory changes on a one to one basis. Compared to exposure, education was the most important part of this process of having significant changes both in attitudes towards disabled people and knowledge about disability (Wozencroft, Pate, & Griffiths, 2015). The importance of training and education to develop positive attitudes towards disability was argued in many studies. Huang and colleagues (2014), for example, conducted a study with graduate students in Taiwan. The results of that study showed that one third of the participants had no idea about the legal rights of disabled people. This pointed out the need for education programs about the awareness of disability and rights of disabled people. All over the world, there can be seen important attempts in the field of education so as to create fair social environments for all of the members of society because education can be seen as the first step of generating positive attitudes towards disabled people. It may increase positive attitudes because of both its accessibility and eye-opener qualities.

Apart from education related researches, studies laying emphasis on attitudes in employment areas have crucial importance in the literature. It is important to note that disabled people should also satisfy their needs and find an appropriate job for themselves. This shows that it is essential to create and increase employment opportunities for all members of a society. The wrong and imperfect framework about disability affects employers' attitudes towards disabled people. They think that disabled people are weak, non-self-sufficient and dependent on other people. This leads to a dilemma in employers' mind to employ disabled people (Ang, Ramayah, & Vun, 2013). Americans with disabilities act (1990) defined the responsibilities of employers as helping disabled people by making essential regulations, organizing unobstructed working environments for disabled workers and encouraging convenient conditions of the related job. Boman, Kjellberg, Danermark, & Boman (2015) claimed no matter whether the person is qualified for the job or not, employers may choose to reject hiring disabled people. National Council on Disability (2007) explained some essential key points of disability and employment problems. It was reported that having a chronic illness or disability causes people not to find an appropriate job. Two

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thirds of these people express their feelings by saying that they really want to work. Why employers do not want to hire disabled people for a job is explained by both supply and demand elements of working environments. As supply, disabled people can require more cost for their working conditions (e.g. arrangements in work environments or health care related disincentives). In terms of demand, there are many reasons like unwilling employers to hire disabled people, organizational cultures which do not have friendly properties for disabled people and lack of appropriate job accommodations for disabled people.

Culture is the other remarkable area for disability literature. In defining and developing attitudes towards disabled people in the society, culture has an important role. In Ghana, many of the disabled women are confronted with verbal, physical, social and sexual abuse. This is because society perceives disabled women as less valuable than others, and it is thought that those women do not deserve extra support and protection. It is clear that in order to protect the rights of the disabled people in the society, government should take a critical role (Kassah, Kassah, & Agbota, 2014). In Turkey, attitudes towards disabled people can be interpreted as more positive and supportive. Altıparmak and Sarı (2012) conducted a study in Manisa, and stated that there are generally positive attitudes towards disabled people in society. Gender, marital status, income level and being in touch with a disabled person were emphasized in studies as the factors determining attitudes towards disability. It was also seen that low education level, middle-age, having children and having an extended family are the determinants of positive attitudes in that city. The researchers pointed out the importance of cultural differences as the cause of not ending up with factors similar to the previously found ones.

Disabled people should be encouraged to be a part of the society education system, work life and social areas like art. This could enable disabled people to change their perception about disability, and as a result, a society with cultural wealth and variety could be obtained. Negative attitudes towards disabled people also negatively affect the respect towards their art. In order to avoid a scene like underestimating the presence

of disabled people, their participation to these areas should be encouraged and if possible they should be a part of professional works of art (Bang & Kim, 2015). Like in the presence in each and every areas of life, disabled people's presence in traffic settings is also important, valuable and must be supported.

1.3.2 Disability in Traffic Settings

All over the world, there are unignorable numbers of disabled drivers. Prasad and colleagues (2006) claimed that 80% of disabled drivers can pass driving tests and be a part of traffic environments. However, it was also reported that accident involvement rate of these disabled drivers increase with the unsolved problems of hand control features of cars (Lawton, Cook, May, Clemo, & Brown, 2008). This finding indicated that to enable better driving experiences for disabled drivers, cars should provide user friendly features, and also, these vehicles should be well equipped.

In their study Lawton and colleagues (2008) selected both disabled drivers and non-disabled drivers as participants. After interviews via telephone, to confirm those interviews, driving sessions were performed. According to the study results, driving performance of disabled drivers did not differ from non-disabled drivers. However, disabled drivers exerted more physical effort than non-disabled ones to keep their body posture stable during driving sessions. It was stressed that this situation could cause fatigue related undesired outcomes in terms of long-distance driving performances. This pointed out the importance of being equipped with support aids in the vehicles of disabled drivers to decrease the necessity of high physical demands.

Similar to Lawton et al.'s study, the previous studies were focusing on the physical features of the cars of disabled drivers or safety issues resulting from the car-driver interaction (e.g Prasad et al., 2006; Monacelli, Dupin, Dumas, & Wagstaff, 2009). Not only vehicle designs, but also inter-personal relations in traffic and identifying group characteristic of disabled drivers can help improve their driving performance in the long run. For this reason, the need for the studies investigating the driver behaviors, performance and attitudes of disabled drivers is obvious. Because of the fact that

disabled drivers and their group characteristics haven't been studied in the literature, this study will provide knowledge about essential and unique characteristic of this group of drivers.

Disability cannot be defined as a unique status because it has many different forms and all of them display idiosyncratic properties. Even more it may be possible that physical, social and psychological conditions that people are living in or being exposed to may result in conditions of a specific type of disability (Koca-Atabey, 2010). For this reason, in order to understand its characteristics and effects in a specific setting, defining disability and drawing its borders are essential. In the present study, disability is defined as not being related to cognition or perception problems. It is defined as limb disability such as amputation, paraplegia or tetraplegia which creates physically difficult conditions to drive a car (Prasad, Hunter, & Hanley, 2006).

1.4 Significance and Aim of the Study

As mentioned in the literature, human factors in driving are closely related to traffic safety (Elander et al., 1993; Lajunen et al., 2004). Although many studies pointed out the importance of human factors in traffic and studied it in relation to other variables for different group of drivers, disabled drivers group hasn't been studies in relation to the human factors in traffic settings.

The current study had three main aims. Firstly, it was aimed to get knowledge about human factors (driver behaviors and driver performance) of disabled drivers for the first time in the literature. In this process, besides self-reports of disabled drivers, non-disabled drivers' evaluations of disabled drivers' driver behaviors and driving skills was gathered. Secondly, developing the 'Attitudes towards Disabled Drivers Scale (ADDS)' and investigating attitudes of both non-disabled drivers and disabled drivers towards disabled driving by using this scale was aimed. The third aim was investigating the relationships between human factors in traffic settings and attitudes towards disabled drivers.

More specifically, the present study aims to;

- Develop an attitude scale to measure attitudes towards disabled drivers

- Investigate the relationship between all study variables and main demographic factors

- Compare disabled drivers and non-disabled drivers on the main demographic variables

- Compare disabled drivers and non-disabled drivers regarding driver behaviors, driving skills, attitudes towards disabled drivers

- Investigate the relationship between non-disabled drivers' attitudes towards disabled drivers in traffic and non-disabled drivers' evaluation of disabled drivers' driver behaviors and driving skills

- Investigate the relationship between disabled drivers' attitudes towards disabled drivers in traffic and their evaluation of their own driver behaviors and driving skills

For the purposes set out above, this study consisted of two parts. The first part of the study mentions the development of an attitude scale measuring attitudes towards disabled driving (Attitudes towards Disabled Drivers Scale-ADDS). The second part of the study involves the main study in which knowledge about attitudes towards disabled driving obtained via ADDS and human factors in driving will be evaluated based on the above mentioned aims.

CHAPTER II

STUDY 1:
DEVELOPMENT OF THE 'ATTITUDES TOWARDS DISABLED DRIVERS SCALE (ADDS)'

2.1 Introduction

Researchers have developed different attitude scales in the previous studies in many areas (e.g. education, work and social life). These scales were developed to determine attitudes of society towards disability in many essential parts of life. Because attitudes towards disabled people differ from every single part of society to other parts, respect for human rights of disabled people is also expected to have different frameworks (Hernandez, Keys, Balcazar, & Drum, 1998). Both to detect this notion and attitudes towards legal policy which was determined by 'Americans with Disabilities Act', Hernandez and colleagues (1998) developed 'The Disability Rights Attitude Scale (DRAS)' scale. It was found that there was an effect of gender, ethnicity and previous contact with a disabled person on attitudes towards disabled people's rights. In the same manner, Koca-Atabey (2010) developed an attitude scale named as 'Attitude towards Disabled People Scale [ADPS]' to measure attitudes of people living in Turkey towards disabled people in society. The study conducted by using this scale showed that positive attitudes towards disabled people are affected from frequently getting in touch with a disabled person. Moreover, people having a disabled family member were found as having more positive attitudes than others. On the other hand, getting in touch with a disabled person shortly before the study or having a disabled person in family did not significantly affect the positive attitudes.

As another example Cheatham, Abell, & Kim (2015) developed an attitude scale named as 'Social Worker's Attitudes towards Disability Scale'. This scale pointed out the mission of social care experts which was about constitute justice for every member

of society and help disabled people live in equal standards with other members of society. According to this scale disability could be seen as cultural diversity rather than a diagnosis.

As mentioned in the previous studies, education has an impact on shaping attitudes towards disabled people (e.g. Moore & Nettelback, 2013; Wozencroft et al., 2015). For this reason, educational field has essential attempts to improve and positively shape attitudes towards disability. To measure attitudes towards disability in education settings and modify the effects of these attitudes in teaching and educational areas, 'Questions about University and Disability' was introduced and validated. It was pointed out that authorities could use these scale for researches and benefit from it both by designing education programs and organizing informative speeches and meetings about required areas (Martin & Arregui, 2013).

Finally, different scales have been developed to measure general attitudes towards disabled people in every part of society. For example, 'The Multidimensional Attitudes Scale toward Persons with Disabilities' (MAS; Findler, Vilchinsky, & Werner, 2007) and 'The Attitudes to Disability Scale' (ADS; Power & Green 2010) could be mentioned as examples.

Although attitudes towards disability were measured by the ADS, disabled driving in relation to attitudes hasn't taken attention previously and there has been no attempt to develop a related scale. In the present study, it was aimed to conduct semi-structured interviews with disabled and non-disabled drivers so as to understand not only disabled drivers' attitudes towards traffic environments and other road users but also non-disabled drivers' attitudes towards disabled driving.

2.2 Method

2.2.1 Participants & Procedure

The participants were 28 drivers 12 of whom disabled drivers and 16 of whom non-disabled drivers. According to knowledge gained from during interviews, all of them

were regular active drivers which mean driving regularly almost every day or few times a week. Table 1 includes overall information about the participants.

Table 1. Demographic Characteristic of the Sample (N=28)

Driver Groups	Demographic Variable	Mean	Standard Deviation	Minimum	Maximum
DISABLED DRIVERS (*N* = 12)	Age	38.7	11	27	59
	Annual Kilometer	5215	5568.5	40	15000
	Driving Experience Year	13.17	8.23	1	27
	Accident Involvement	1.33	.58	0	2
	Penalty Number	1.75	.96	1	3
NON-DISABLED DRIVERS (*N* = 16)	Age	30.81	11.91	24	55
	Annual Kilometer	3887.50	2483.78	1000	10000
	Driving Experience Year	10.13	8.48	2	30
	Accident Involvement	1.33	.58	1	2
	Penalty number	1.50	.58	1	2
TOTAL GROUPS (*N* = 28)	Age	34.21	11.62	24	59
	Annual Kilometer	4456.43	4063.03	40	15000
	Driving Experience Year	11.71	8.12	2	30
	Accident Involvement	1.33	.50	1	2
	Penalty number	1.63	.74	1	3

The mean age of disabled drivers was 38.7 (*SD*= 11, range = 27-59). While 5 of the participants were female, 7 of them were male drivers. On average, they had annual kilometer of 5215 km (*SD*= 5568.5, range = 40-15000) with a mean of driving experience of 13.17 years (*SD*= 8.23, range = 1-27). While the average number of accidents being involved in the last three years was 1.33 (*SD*= .58, range = 0-2) the average number of penalties in the last three years was 1.75 (*SD* = .95, range = 1-3).

On the other hand, the mean age of the non-disabled drivers was 30.81 (*SD*= 11.91, range = 24-55). While 8 of the participants were female, 8 of them were male drivers. . On average, they had annual kilometer of 3887.50 km (*SD*= 2483.78, range = 1000-10000) with a mean of driving experience of 10.13 years (*SD*= 8.48, range = 2-30). While the average number of accidents being involved in the last three years was 1.33 (*SD*= .58, range = 1-2) the average number of penalties in the last three years was 1.50 (*SD* = .58, range = 1-2).

After obtaining approval from METU Human Subjects Ethic Committee, to reach disabled drivers Disability Support Office in METU was visited (see Appendix A).

Via e-mail all of the members of this association were informed about the study. Volunteers from Ankara contacted with the researcher and they were visited for having an interview. Furthermore, in Mersin some of the disabled people working in government offices were reached by using personal communications. Voluntary participants were visited in their office. On the other hand, because reaching non-disabled drivers were easier than disabled ones based on personal communication randomly chosen participants from Ankara, İstanbul and Mersin were interviewed. Participants were given demographic form to fill out (see Appendix B). Then, the researchers read the questions by arranging their accordance with the flow of interview and kept a record by writing the conversation. Although there were prepared questions in the interview form, semi-structured interview style was used so as to prevent missing unmentioned knowledge in the questions.

2.2.2 Measures

2.2.2.1 Development of the Interview Form

To conduct semi-structured interviews with disabled and non-disabled drivers, 'Disabled Driving Interview Form (DDIF) was developed. After investigating disability studies measuring attitudes towards disabled drivers in different areas of social life (e.g. Yuker, Block, & Younng, 1970; Aycan, 2005 and Koca-Atabey, 2010), some possible questions representing general problems of disabled drivers were determined and questioned for traffic environments. Furthermore, based on the purpose of understanding nature of disabled driving, the place of them in traffic settings and possible problems of disabled drivers, some informative questions were prepared. The DDIF included 14 questions. The questions were about driving course periods, procedure of statement of health for driving license, possible problems of disabled drivers, general attitudes towards disabled driving, differences between disabled and nondisabled drivers in terms of driving knowledge, obeying the traffic rules, driving skills, protecting traffic environment and other road users and possible improvements so as to create more comfortable and safe traffic environments for disabled drivers. Additionally, critical incident questions focusing on specific negative

and positive on the road experiences of disabled/non-disabled drivers were also included into the DDIF. For the interview questions see Appendix C.

2.3 Results

2.3.1 The Content Analysis of DDIF:

The content analysis was performed on the responses given by both disabled and non-disabled drivers using qualitative research techniques. Two researchers were analyzed the content of interview results. This analysis was done according to frequencies of answers given by both disabled drivers and non-disabled drivers separately. After analyzing the interview results, some sub-categories were defined based on common evaulations of researchers. While some questions divided into sub-categories according to the content of answers of participants, some questions representing similar contents were analyzed together. It is because if the answers given by participants included similar content, all answers were collected under the same dimensions or sub-dimensions. Interview questions, answers of participants and frequencies of these answers were presented in following sections.

Question 1: *'Engelli sürücülerin ehliyet alma ve ehliyet kursu süreciyle ilgili neler söyleyebilirsiniz?'*

This question was divided into two categories as theoretical process and practical process based on the analysis done by answers of participants. First of all theoretical process of driving course examined, answers of disabled drivers about their theoretical education and frequencies of these answers were presented as '*Engelsiz sürücülerin aldığı teorik eğitimle aynıdır (N = 6'), 'Ehliyet sınavında teori kısmında motor bölümünden muaftık (N = 1)', 'Teori kısmında ilkyardım bölümünden muaftık (N = 1'), 'Teorik eğitim pratik eğitimden daha etkiliydi (N = 1)'*. On the other hand, interviews conducted with non-disabled drivers showed that there was a lack of knowledge about disabled drivers' getting driver's license. Answers of non-disabled drivers about disabled drivers' theoretical education in driving course and frequencies of these answers were presented as '*Teorik kurs süreci farklı değildir (N = 9'), 'Teorik*

kısma katılımları önemli ve/veya gerekli değildir (N = 4)'. Secondly, practical process of driving course examined, answers of disabled drivers about their practical education and frequencies of these answers were presented as '*Özel donanımlı araç eksikliği sebebiyle, bütün sürücü kurslarında engelli sürücülere pratik eğitim verilemiyor (N = 3)', 'Özel donanımlı araç eksikliği sebebiyle, sınav döneminde aracımı kendim yaptırmak zorunda kaldım (N = 5'), 'Kursta bize biraz daha öncelikli davranıldı (N = 1)', 'Pratik sınavında sadece ileri ve geri gitme gibi temel bölümlerden sorumlu tutuldum (N = 1)'*. Compared to disabled drivers, non-disabled drivers think that practical driving education of disabled drivers was more equipped and special than their education. Moreover, although there were non-disabled drivers stated that disabled drivers could be as competent as non-disabled ones after the same practical education with their education, some of the non-disabled drivers implicated that disabled drivers needed more education for the same standards with non-disabled ones in traffic settings. Answers of non-disabled drivers about disabled drivers' practical education in driving course and frequencies of these answers were presented as '*Engelli sürücülere pratik/direksiyon eğitimi için özel araç sağlanmaktadır (N = 4)', 'Engelli sürücüler direksiyon eğitimi için daha detaylı bir eğitim almalıdır (N = 5)', 'Engelli sürücüler direksion eğitiminde daha fazla zorlanmaktadır (N = 2)'* and '*Pratik eğitimin iyi verilmesi durumunda performans açısından engelsiz sürücülerle aralarında fark olmamaktadır (N = 1)'*.

Question 2: *'Ehliyet için sağlık raporu alma sürecinizi kısaca anlatır mısınız?'*

Answers of the second question divided into two categories representing disabled drivers' experiences and non-disabled drivers' experiences. Firstly, it was observed that it was difficult for disabled drivers to get medical report. These difficulties were not only taking long time to get committee health report, but also physical conditions of hospitals which posed obstacles for disabled drivers. Only one disabled driver reported that she could get medical report easily with the help of driving course. Answers of disabled drivers for this question and frequencies of these answers were presented as '*Engelsiz bireylere göre daha zor bir süreçti (N = 9)', 'Hastanedeki bütün*

bölümleri dolaşıp heyet raporu almam gerekti (N = 3'), *'Engelli bir birey için zahmetli bir süreçti (N = 1')*, *'Üç gün boyunca hastanedeki bütün bölümleri dolaştım (N = 1')*, *'Sürücü kursunun yönlendirmesiyle zorlanmadan aldım (N = 1')*, *'Hastanelerin fiziksel koşulları süreci zorlaştırdı (N = 4')*. In the other category, experiences of non-disabled drivers' about getting medical report for driver's license education was more positive than disabled drivers' hospital experiences. Only two non-disabled drivers reported that they had difficulty to get medical report because of the problems during visual tests. Answers of non-disabled drivers for this question and frequencies of these answers were presented as *'Ehliyet kursunun yönlendirmesiyle sağlık ocağından kolaylıkla aldım (N = 2')*, *'Kolay bir süreçti (N = 8)'*, *'Sağlık raporu şahsi beyanlarıma dayanıyor, muayene kısaydı (N = 2)'*, *'Detaylı bir süreç değildi (N = 4)'*.

Question 3: *'Sizce yaşadığınız şehirde trafikte aktif olarak araç kullanan kaç engelli sürücü bulunmaktadır?'*

Answers of this question were divided into two categories according to having information about the number of disabled drivers or not. Disabled drivers tended to report an exact number and pointed out that there could be more disabled drivers than their estimates. Moreover, they stated that more disabled drivers would be parts traffic environments if they were encouraged. Estimations of disabled drivers about number of disabled drivers in traffic environments and frequencies of these answers were presented as *'100'den fazladır (N = 1)'*, *'200 civarı (N = 1)'*, *'4000-5000 (N = 2)'*, *'Toplam nüfusun %5'i (yaşadığı şehir nüfusu yaklaşık olarak 1.800.000; N = 1)'*, *'1000 civarı (N = 1)'*. On the other hand, non-disabled drivers reported that they had never thought about presence of disabled drivers in traffic environments. For this reason, only five of them answered the question. Estimations of non-disabled drivers about number of disabled drivers in traffic environments and frequencies of these answers were presented as *'2000 (1)'*, *'50.000(1)'*,*' 400.000(1)'*, *'200 (1)'*, *'400-500 (1)'*.

Question 4: *'Sizce engelli sürücüler araç kullanırken ne tür sorunlarla karşılaşırlar?*

The answers of this question were divided into two sub-dimensions as problems originated from other driver groups and problems originated from disability outcomes. First of all, in terms of problems related to other driver groups, disabled drivers reported that many of their problems originated from non-disabled drivers reckless driving habits. Answers of disabled drivers about these problems and frequencies of these answers were presented as '*Engelsiz sürücülerin hızlı araç kullanması (N = 1)*', '*Diğer sürücüler kornaya basarak ve camdan seslenerek bizleri hataya sürüklemesi (N = 2)*', '*Engelli park yerlerinin işgal edilmesi (N = 10)*', '*Vatandaşların duyarsızlığı (N = 1)*', '*Trafikte kaba davranılması (N = 1)*'. On the other hand, non-disabled drivers stated that disabled drivers confronted similar problems with non-disabled ones because these problems originated from reckless driving habits of Professional drivers like taxi drivers or bus drivers. Answers of non-disabled drivers about these problems and frequencies of these answers were presented as '*Engelli sürücüler engelsiz sürücülerin karşılaştıklarına benzer problemlerle karşılaşırlar (N = 3)*', '*Taksiler, dolmuşlar tarafından sıkıştırılmak (N = 2)*', '*Dolmuş ve taksi şoförleri tarafından daha hızlı gitmeye veya kırmızıda geçmeye zorlanmak (N = 1)*', '*Engelli sürücü plakalarının yarattığı, etiketleme sorunları (N = 3)*,*' Diğer sürücülerin engelli otoparkını işgal etmesi (N = 7)*','*Diğer yol kullanıcılarının kuralları ihlal eden davranışları (N = 1)*'. As the second category problems of disabled drivers originated from disability outcomes was investigated. Answers of disabled drivers about these problems and frequencies of these answers were presented as '*Özel araçlarımızda fren sisteminin el ile yürütülmesi (N = 2)*', '*Park yerlerinde duba ve zinciri kaldıramamak (N = 3)*', '*Manuel araç kullanamamak (N = 1)*'. However, non-disabled drivers could not give answers for the outcomes of disability related results. They usually focused on problems originated from professional driver groups.

Question 5: *'Trafikte engelli sürücülerin diğer engelli sürücülere yönelik duygu, düşünce ve davranışları konusundaki görüşleriniz nelerdir?'*
Question 8: *'Trafikte engelsiz sürücülerin engelli sürücülere yönelik duygu, düşünce ve davranışları konusundaki görüşleriniz nelerdir?'*

This two questions placed under the same dimension and divided into three categories; emotion, opinion and behavior. Firstly, Discriminator answers of disabled drivers about emotions of disabled drivers for their own group members and frequencies of these answers were presented as '*Engelli sürücüler diğer bireyin durumunda haberdardırlar (N = 2)*', '*Engelli sürücülere karşı hassastırlar (N = 3)*', '*Engelli sürücülerin engelsiz sürücüler kadar iyi araç kullanmasına seviniyorum (N = 1)*'. Discriminator answers of disabled drivers about emotions of non-disabled drivers for disabled ones and frequencies of these answers were presented as '*Daha hassas olmalarını beklerim (N = 1)*', '*Daha duyarlı olmaları gerekir (N = 2)*'. On the other hand, while discriminator answers of non-disabled drivers about emotions of disabled drivers for their own group and frequencies of these answers were presented as '*Empati kurabilirler (N = 5)*', discriminator answers of non-disabled drivers about emotions of their own groups for disabled drivers and frequencies of these answers were presented as '*Nasıl araç kullandıklarını bilmediğim için tedirgin hissediyorum (N = 1)*', '*Güvensiz hissediyorum (N = 1)*', '*Acıma ve merhamet duygusu hakim olabilir (N = 1)*', and '*Empati kuramazlar (N = 1)*'. Secondly, discriminator answers of disabled drivers about opinions of disabled drivers for their own group members and frequencies of these answers were presented as '*Karşıdakinin de engelli olduğunu düşünmek (N = 1)*' and '*Durumundan haberdar olmak (N = 2)*'. In addition, discriminator answers of disabled drivers about opinions of non-disabled drivers for disabled ones and frequencies of these answers were presented as '*Aramızda bir fark yok, sorun yaşamadım (N = 4)*'. On the other hand, other than one non-disabled driver any of them give answers about opinions of disabled drivers for their own group. The answer of this participant was presented as '*Benden başka engelli sürücüler de varmış diye düşünüyorlardır (N = 1)*'. As the last category, behaviors were investigated. While discriminator answers of disabled drivers about behaviors of disabled drivers for their own group members and frequencies of these answers were presented as '*Saygılı davranırlar (N = 3)*', '*Duyarlı davranırlar (N = 2)*' and '*Trafikte öncelik verirler (N = 1)*', the frequencies of answers about behaviors of non-disabled drivers for disabled ones were presented as '*Saygısız davranıyorlar (N = 2)*', '*Küçümseyerek*

davranıyorlar (N = 1)', 'Daha pozitif davranabilirler (N = 1)' and *'Anlayışsız davranırlar (N = 2)'.* For the non-disabled drivers, it was draw attention that while discriminator answers of non-disabled drivers about behaviors of disabled drivers for their own group members and frequencies of these answers were presented as *'Yol verme (N = 2)'* and *'Anlayışlı davranma (N = 3)',* the frequencies of answers about behaviors of non-disabled drivers for disabled ones were presented as *'Öncelik verme (N = 1)', 'Trafikte sıkıştırmama (N = 2)', 'Engelli sürücülerin haklarını ihlal eden davranışlar sergileme (N = 1)', 'Engelli park alanlarını kullanma (N = 1)'.*

Question 6: 'Trafik ortamında engelli bir sürücüyle yaşadığınız veya şahit olduğunuz **olumsuz** *bir durumu anlatabilir misiniz?'*
Question 7: 'Trafik ortamında engelli bir sürücüyle yaşadığınız veya şahit olduğunuz **olumlu** *bir durumu anlatabilir misiniz?'*

The answers of these questions were divided into two categories as negative witnessed experiences or true life experiences and positive witnessed experiences or true life experiences. First of all, for negative witnessed experiences or true life experiences, four of the disabled participants reported that they had never had problem with a disabled driver in traffic environments. Answers of other disabled drivers and frequencies of these answers were presented as *'Benzini biten bir engelli sürücüye kimse yardım etmişti (N = 1)'* and *'El mekanizması bozulan bir engelli aracının ışıkta kalması sonucu gelen kişilerin, haline bakmadan trafiğe çıkmış yorumları üzücüydü (N = 1)'.* As the second driver group, non-disabled drivers pointed out that they had any negative experience with disabled drivers in traffic settings. However, some of them reported positive answers as being *'Yardımlaşma engelli sürücüler arasında oluyor (N = 1)'* and *'Engelli bir sürücü benim park alanından daha rahat çıkabilmemi sağlamak açısından daha uzağa park etmişti (N = 1)'.*

Question 9: 'Trafik ortamında engelsiz bir sürücüyle yaşadığınız veya yaşandığını şahit olduğunuz olumsuz bir durum oldu mu? Olduysa bu durumu anlatabilir misiniz?'
Question 10: 'Trafik ortamında engelsiz bir sürücüyle yaşadığınız veya yaşandığını şahit olduğunuz olumlu bir durum oldu mu? Olduysa bu durumu anlatabilir misiniz?'

Similar with 'Question 6' and 'Question 7', the answers of these questions were divided into two categories as negative experiences and positive experiences. First of all, for negative experiences, one of the disabled participant reported that his negative experince by stating that '*Engelli park alanına park eden, engelsiz bir sürücü ile tartışmıştık*'. Another disabled driver mentioned his negative experience caused by a non-disabled driver by saying that '*Önünde engelli bir sürücü ile seyir halindeyken; engelli sürücünün kendisi için büyük bir risk taşıdığını düşünen engelsiz bir sürücü ile seyir halindeydim. Bir an önce önündeki aracı geçmeye çalışıyordu. Fakat farkında olmadığı nokta, öndeki aracın trafik kurallarına kendisinden çok daha dikkat ettiğiydi. Engelsiz sürücülerdeki bu yanılgı ortadan kaldırılmalıdır*'. *Secondly*, answers of non-disabled drivers and frequencies of these answers were presented as '*Engelli sürücülerin park alanına aracını bırakan bir sürücüyü uyardığımda, çok özür diledi (N = 2)*', '*Bazen engelli sürücü görünce park yerini boşaltıp yer veriyorlar (N = 1)*', '*Zor durumda kaldığım bir günde taksici yardım etmişti (N = 1)*' for negative experiences and '*Engelsiz bir sürücü engelli bir sürücüye sıkışık trafik ortamından kurtulması için yol vermişti (N = 1)*' for positive experiences.

Question 11: Sizce engelli ve engelsiz sürücüler arasında sırasıyla trafikle ilgili bilgileri, kurallara uymaları ve araç kullanma becerileri konusunda farklar var mıdır? Varsa ne gibi farklardan bahsedebilirsiniz?
Question12: Sizce engelli ve engelsiz sürücüler arasında sırasıyla trafik ortamını, düzenini ve diğer yol kullanıcılarını koruyucu ve kollayıcı olmak açısından farklar var mıdır? Varsa ne gibi farklardan bahsedebilirsiniz?

The answers of these questions were divided into 6 categories based on content analysis of them. The first category was knowledge about traffic rules and regulations. In this category, both disabled drivers and non-disabled drivers reported that there were no differences between these driver groups in terms of knowledge. The second category was obeying the traffic rules. The answers of disabled drivers fort this category and frequencies of these answers can be reported as '*Engelli sürücüler kurallar konusunda daha hassastır (N = 3)*', '*İki grubun kurallara uyma konusunda*

farkı yoktur (N = 2)', 'Kişilik ile ilgili olduğunu düşünüyorum (N = 1)'. Likewise, disabled drivers, non-disabled drivers reported more positive driver behaviors for disabled drivers than themselves in terms of obeying the traffic rules. The answers of non-disabled drivers for this category and frequencies of these answers was presented as *'Engelli sürücülerin trafik kurallarına daha çok uyduğunu düşünüyorum (N = 2)', 'İki grubun kurallara uyma konusunda farkı yoktur (N = 1), Bilgim yok fakat engelli sürücülerin daha dikkatli olması gerekir (N = 1)'.* At the third category, driving skills were investigated. While answers of disabled drivers and frequencies of these answers presented as *'Engelli sürücüler daha dikkatlidir (N = 4)', 'Eğer sürücünün engeli doğuştan değilse, engelli sürücüler daha dikkatli olabiliyor (N = 1)', 'İki grupta da deneyim önemlidir (N = 1)',* answers of disabled drivers and frequencies of these answers presented as *'Engelli sürücülerin araç kullanma becerileri daha fazladır (N = 2)', 'Var olan engellerini kullanmayacakları bir araca sahip oldukları için, engelli ve engelsiz sürücülerin becerileri arasında fark yoktur (N = 1)'.* The fourth category was about being protective and caring for traffic environments. None of the disabled drivers answered this question in detail. On the other hand, non-disabled drivers' answers were as the following; *'Engelli sürücüler trafik ortamını ve diğer yol kullanıcılarını daha iyi tanımaktadır (N = 1)', 'Engelli sürücü olmaktan gelen bir farkın olacağını düşünmüyorum (N = 2)'.* In the next category being protective and caring for traffic order was examined. While disabled drivers stated that they were more protective and sensitive for traffic order, non-disabled drivers claimed that there were no differences between disabled and non-disabled drivers in terms of being protective and caring to traffic order. As the last category, being protective and caring for other road users was examined. While answers of disabled drivers and frequencies of these answers were presented as *'Yayalara karşı engelli sürücüler daha dikkatlidir (N = 2) '* and *'Engelli sürücüler diğer yol kullanıcıları için daha duyarlıdır (N = 2)',* answers of non-disabled drivers and frequencies of these answers were presented as *'Engelli sürücü olmaktan doğan bir farkın olacağını düşünmüyorum (N = 2)', 'Engelsiz bir sürücünün engelli sürücüye yardım ettiğini çok kez gözlemledim, engelsiz sürücüler de engelli sürücüler kadar duyarlıdır (N = 1)'.*

Question: 13: Sizce engelli sürücüler trafikte özel yasal haklara sahip olmalı mı? Evet, ise neden ve ne gibi haklara sahip olmalılar?

Question 14: Sizce engelli sürücüler için daha rahat ve güvenli bir trafik ortamı nasıl oluşturulabilir? Bu konuda neler yapılmalıdır?

In this part, categorization was planned as possible privileges for disabled drivers in traffic environments and actions to be taken for disabled drivers to drive more easily and safely. In the first category the answers of disabled drivers were presented as *'Özel haklara sahip olmak trafik kurallarına uymayı negatif etkileyecektir (N = 2)', 'Engelli araçları daha ucuz olmalı (N = 1)', 'Engelli araçlarına donanım sağlayan birimler daha fazla sayıda olmalı (N = 2)', 'Ayrı bir emniyet şeridi olabilir (N = 2)', 'Eş ve çocukların da aynı aracı kullanabilmesi sağlanmalı (N = 1)', 'Özel park alanları için kesin çözümler üretilmeli (N = 5)',' %40 engel sahibi bir sürücü H sınıfı ehliyet aldıktan sonra tekrar rapor vermek zorunda olmamalıdır (N = 1)'.* Compared to disabled drivers, non-disabled drivers declared that having privileges was not necessary for disabled drivers. It is because many of the non-disabled stated that disabled drivers didn't have worse driving skills than non-disabled ones. Answers of other non-disabled drivers suggesting some additional rights for disabled drivers and frequencies of these answers presented as *'Rahat ve güvenli seyahat etmeleri için her türlü yeni düzenleme yapılmalıdır (N = 1)', 'Otopark sorunları çözülmelidir ve otopark artırılmalıdır (N = 4)', 'Trafikteki hız sınırları engelli sürücülere göre düzenlenmelidir (N = 3)', 'Arıza veya kaza durumunda özel hakları olmalıdır (N = 1)'.* As the second category actions to be taken for disabled drivers to drive more easily and safely were analyzed. While answers of disabled drivers and frequencies of these answers were presented as *'Araç yenileme kuralları kaldırılmalıdır (N = 1)', 'Bazı engelli sürücülere fahri trafik müfettişliği yetkisi verilmeli ve engellilerin trafikte yaşadığı sorunların acil çözülmesi sağlanmalıdır (N = 1)', Eğitimler düzenlenmelidir (N = 2)'* and *'Park yerleri çoğaltılmalıdır (N = 5)',* only one non-disabled driver having a disabled family member proposed possible actions by stating that *'Park yerleri arttırılmalı ve engelli sürücüler için daha uygun araçlar üretilmelidir. Aynı*

zamanda park alanlarında engelli sürücülerin araçlarına inip binmelerini kolaylaştıran çözümler üretilebilir'.

2.3.2 Evaluation of DDIF Results and Development of 'Attitudes towards Disabled Drivers Scale (ADDS)'

Semi-structured interviews with disabled drivers and non-disabled drivers provided base for the development of ADDS to conduct new studies and understand disabled driving in more detail. Because there wasn't any scale to measure attitudes towards disabled driving, it is the first attempt to understand attitudes of both disabled drivers and non-disabled drivers towards disabled driving in traffic environments.

The interview results of the Study 1 showed that disabled drivers had positive attitudes towards other disabled drivers but they interpreted attitudes of non-disabled drivers more negative than disabled ones. Moreover, disabled drivers reported some problems during getting driving license course education and driving activity (e.g. getting statement of health, parking areas and traffic density). When asked about traffic environment experiences; while disabled drivers reported more negative examples, non-disabled drivers mentioned experiences reflecting their groups' sensitiveness towards disabled driving. According to disabled drivers' statement there is no difference between technical driving education period of disabled and non-disabled drivers. However, it was remarkable that some disabled drivers declared that they were exempted from motor and first aid knowledge when qualifying examination. While generally non-disabled drivers reported that they had any knowledge about driving license education of disabled drivers, some of them stated that their exempted from technical knowledge is normal and they do not need technical ways of driving on traffic environments. When considered disabled drivers' declared problems, it is clear that violation and error type behaviors of other road users bring trouble for disabled drivers. Lastly, limited number and negative physical conditions of parking areas for disabled drivers converge on body movement limitations of disabled drivers and created essential problems for them on traffic.

After analyzing interview results and determining some possible items for ADDS, literature review was performed by investigating the disability literature and attitude scales for disability. Although all attitude scales which could be found from the literature analyzed, attitude scales containing the relevant items for traffic environments were selected. These items were adapted for traffic environments by reforming contents and language for disabled driving. First of all, '*Attitudes towards Disabled People Scale (ATDP)*'developed by Yuker et al. (1970) was examined. The scale had been prepared as being three forms (Form 0, Form A and Form B) and 6-point likert scale type. The main aim of the scale was to detect attitudes towards disabled people and American Psychology Association was first mentioned this approach at their meetings in 1959.The second investigated scale was '*Attitudes towards Employment of Disabled People*' developed by Aycan (2005). This scale was measured attitudes towards disabled people in working environments. Relevant items were chosen and adapted for traffic environments. The other referenced scale was '*Multidimensional Attitudes Scale Toward Persons with Disabilities* (MAS)' which was developed by three dimensional approach; cognitive, behavioral and emotional (Findler et al., 2007). The scale included a scenario in which a disabled person joined in a social environment of nondisabled people. Participants were asked to evaluate their attitude towards this situation with using 5-point likert scale. The last attitude scale using for item selection was 'Attitudes towards Disabled People Scale' with 6-point Likert-type scale developed by Koca-Atabey (2010).

2.3.2.1 Final List of the Dimensions and Items of ADDS

In the last step, considering attitude dimensions of other attitude scales from the literature and content of the prepared items, 4 dimensions and 65 items were determined. The names of the dimensions were 'Competence in traffic environments', 'Social interaction and skills', 'Empathy for disabled drivers' and 'Rights of drivers in traffic settings'. A form of the items and dimensions were prepared in a questionnaire format without mentioning the placement of items under the possible dimensions and attitude elements. Furthermore, behavioral, cognitive and emotional elements of

attitudes were also included to the form for experts to place the items under relevant elements (see Appendix D). In the first page of this form, definitions of dimensions and meanings of 3 attitude elements were presented. This mixed list of items, dimensions and attitude elements was evaluated by raters who were experts in Traffic and Transportation Psychology field (*N*=3). Experts gave opinion about the context and language congruity of items, items' fitting under which determined dimensions and items' fitting under which elements of attitude. The items which were fitted under the same dimension and attitude element by at least two experts were hold in the scale. By considering expert evaluation essential language and context editing was performed over the scale items which were not easy to understand. Moreover, some items which were evaluated as having the same content with another one were excluded from the scale. The final version of the ADDS had 50 items and 4 dimensions. This last version of the scale was used in the main study, and the factor structure of the scale was reported in the result section of the main study.

2.4 Discussion

In the literature, studies usually focused on disabled people and their problems in the area of education (Wozencroft et al., 2015; Huaeng et al., 2014), work (Ang et al., 2013; Boman et al., 2015) and culture (Kassah et al., 2014; Altıparmak & Sarı, 2012). These studies enabled both researchers and practitioners to find solutions for the problems of disabled people and recognize their group characteristics. When these studies were investigated, nonexistence of the studies related to road-traffic environments which is another essential area of social life is drawn attention. In this perspective, the current study contributes new understanding to the literature. It is because there were any attempts in the literature for having interview with disabled and non-disabled drivers to understand and gain knowledge about disabled driving. This study enabled to understand differences between disabled and non-disabled drivers in terms of their perspectives about disabled driving. As another contribution, non-disabled driver participants of the current study reported that the interviews increased their awareness of disabled drivers in traffic environments. During

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interviews they stated that there was minimum number of disabled drivers, so they had never met with one of them. However, at the end of the interviews many of them reported that they had gained inadequate knowledge and awareness about disability until that interview process make them to think about existence of disabled drivers in traffic environments. As another contribution of the current study, the results of the interviews formed a basis for the development of a new attitude scale to measure attitudes towards disabled driving (ADDS). Because attitudes towards disabled driving have also never been studied in the literature, this scale will help to gain understanding of disabled driving in detail and with new perspectives.

The findings of interviews and ADDS will offer an insight into new studies about disabled driving like conducting a study with ADDS and testing whether the results of this study will be consistent with the results of interviews. As seen in education field studies about disability, these attempts may improve awareness of people about disability and disabled people (e.g. Moore & Nettlebeck, 2013 and Wozencroft et al., 2015). In addition, the new studies may provide information about disabled drivers need and problems in traffic environments to plan and activate education and intervention programs in the long run. As done in Study-I, they can be used to develop new measurement techniques and acquire more knowledge about disabled driving. With all these findings and innovations, interviews performed in the current study and ADDS will provide future studies prior knowledge. In this way, it has potential to contribute new perspectives to study fields both theoretically and practically.

CHAPTER III

MAIN STUDY:

ATTITUDES TOWARDS DISABLED DRIVERS & HUMAN FACTORS IN DRIVING: DISABLED AND NON-DISABLED DRIVERS

3.1 Introduction

As stated in Study-I, despite their existence in traffic environments with remarkable amounts, disabled drivers in relation to human factors in driving have not been studied so far. On the other hand, in the literature there have been different studies investigating disabled driving by emphasizing the importance of car designs and/or environmental factors. For example, Monacelli and colleagues (2009) conducted a study investigating disabled drivers' driving conditions and expectations in France. They explained that disabled people want to drive their own cars to participate daily life; they would like to drive not only for the work-home transportation purposes but also for social and personal reason. Unfortunately, this is not so easy because disabled driver friendly vehicles are more expensive as compared to non-disabled drivers' cars, and they are exposed to restrictions caused by legal permissions. Additionally, Prasad and colleagues (2006) investigated the relationship between new driving style of disabled drivers who didn't have inborn disabilities and achievements or accidents after disability. It was reported that although hand control cars of disabled drivers caused highest accident involvement, disabled drivers could overcome other vehicle related problems in time. For this reason, researchers pointed out the importance of disabled drivers' feeling of control on the physical environment by adapting their vehicles. However, these studies are limited to the frame of environmental and vehicle elements of traffic environments, they have not mentioned about the driver related characteristics in disabled driving.

Although many individual factors of non-disabled drivers like age (Rimmö &

Hakamies-Blomqvist 2002; Winter & Dodou, 2010), sex (Bener et al., 2013; Özkan & Lajunen, 2006) and exposure (Mccartt et al., 2009; Waller et al., 2001) have been studied many times, there were no attempts to understand and get detailed knowledge on disabled drivers. In this study, first of all disabled drivers' and non-disabled drivers' attitudes towards disabled driving will be investigated by using ADDS scale developed within the content of this thesis and mentioned about Study-I. Moreover, getting detailed knowledge about human factors in disabled driving; that is trying to understand driver behaviors and driving skills of disabled drivers was aimed in the current study. The differences and similarities between disabled and non-disabled drivers in human factors will be enlightened.

3.2 Method

3.2.1 Participants and Procedure

A total of 538 drivers from different cities (Ankara, Mersin, İstanbul, İzmir, Kahramanmaraş, Gaziantep) participated in the current study. There were two groups in the study; disabled drivers and non-disabled drivers. The number of disabled drivers having orthopedically problems was 189 while a total of 349 non-disabled drivers participated to the study. Table 2.1 and Table 2.2 represent the demographic information about participants.

Table 2.1. Sample Characteristics (*N* = 538)

Demographic Variables	Disabled Drivers		Non-disabled Drivers		Total	
	N	%	*N*	%	*N*	%
SEX						
Female	30	15.9%	128	36.7%	158	29.4%
Male	159	84.1%	221	63.3%	380	70.6%
EDUCATION LEVEL						
Elemantary School	20	10.6%	8	2.3%	28	5.2%
High School	88	46.6%	47	13.5%	135	25.1%
Vocational School	19	10.1%	26	7.4%	45	8.4%
Bachelor Degree	47	24.9%	220	63%	267	49.6%
Graduate Degree	13	6.9%	47	13.5%	60	11.2%
Other	2	1.1%	1	.3%	3	.6%
FREQUENCY OF DRIVING						
Nearly in every day	121	64%	187	53.6%	308	57.2%
3 or 4 days of a week	35	18.5%	65	18.6%	100	18.6%
1 or 2 days of a week	16	8.5%	41	11.7%	57	10.6%
Few times in a month	7	3.7%	37	10.6%	44	8.2%
Rarely	8	4.2%	19	5.4%	27	5%

Table 2.2. Sample Characteristics (*N* = 538)

Driver Groups	Demographic Variable	Mean	Standard Deviation	Minimum	Maximum
	Age	38.24	8.90	20	70
	Driving Experience Year	11.94	7.74	.25	43
	Annual Kilometer	15298.72	21668.08	0	200000
DISABLED DRIVERS	Last Three YearActive Accident Involvement	.69	1.16	0	8
(*N* = 189)	Last Three Year Passive Accident Involvement	.57	1.01	0	6
	Penalty for Wrong Parking	.29	.90	0	7
	Penalty for Improperly Passing	.06	.36	0	4
	Penalty for Speeding	.66	1.42	0	10
	Age	32.32	12.00	18	75
	Driving Experience Year	10.65	9.48	.08	44
	Annual Kilometer	100021.08	18900.07	5	300000
NON-DISABLED DRIVERS	Last Three YearActive Accident Involvement	.70	1.28	0	15
(N = 349)	Last Three Year Passive Accident Involvement	.44	.90	0	6
	Penalty for Wrong Parking	.25	.74	0	8
	Penalty for Improperly Passing	.04	.34	0	5
	Penalty for Speeding	.60	1.18	0	8
	Age	34.37	11.38	18	75
	Driving Experience Year	11.10	8.92	.08	44
	Annual Kilometer	11951.53	20042.62	0	300000
TOTAL GROUPS	Last Three YearActive Accident Involvement	.70	1.24	0	15
(N = 538)	Last Three Year Passive Accident Involvement	.48	.94	0	6
	Penalty for Wrong Parking	.27	.80	0	8
	Penalty for Improperly Passing	.05	.35	0	5
	Penalty for Speeding	.62	1.27	0	10

All disabled driver participants of the study were the drivers having orthopedically problems. As mentioned in the disability definition of the current study, participants had paraplegia, tetraplegia or amputation type disabilities. Despite this, not all of them had class H driving license which represents disabled driving in traffic environments in Turkey. Only 176 of them had class H driving license depending on the laws allowing ownership of H class driving license upon medical examination legislation in Turkey. Table 2.1 represents the number and percentage of sex of disabled drivers, their education levels and driving habits in a given time. While 159 of the disabled drivers were male (84.1%), 30 of them was female (15.9%) participants. Education level of disabled drivers differentiated from elementary school to graduate degree. Twenty of the participants had elementary school degree (10.6%), 88 of them had high school degree (46.6%), 19 of them had vocational school degree (10.1%), 47 of them bachelor degree (24.9%), 13 of them had graduate degree (6.9%) and 2 of them reported other education levels (1.1%; faculty of open university and college dropout). Frequency of driving information was collected based on 5 different time duration. Reports showed that 121 of the disabled drivers drive nearly in every day (64%), 35 of them drive in 3 or 4 days of a week (18.5%), 16 of them drive 1 or 2 days of a week (8.5%), 7 of them drive few times in a month (3.7%) and 8 of them drive rarely (4.2%).

As seen in Table 2.2, the mean age of all participants was 38.24 (range = 20-70, SD= 8.90). The year of driving experience mean 11.94 (range = .25-43 years, SD = 7.74). Annual kilometer mean of disabled drivers was 155298.72 (SD = 21668.08, range = 0-200000). Participants also reported their last three years of active accident involvement (M = .69, SD = 1.16, range = 0-8) and last three years of passive accident involvement (M = .57, SD= 1.01, range = 0-6). As last demographic variable, disabled drivers reported their traffic penalty tickets of the last three years. The mean value of traffic penalties was respectively .29 for wrong parking (SD= .90, range = 0-7), .06 for improperly passing (SD = .36, range = 0-4) .66 for speeding (SD = .1.42, range = 0-10). Moreover, some of the disabled drivers reported other types of penalties like passing in the red light (N = 4), talking on the cell phone while driving (N = 4), drunk driving (N = 1), unsafe lane change (N = 2) and violation of roundabout rule (N = 2).

The second group of participants consisted of 349 non-disabled drivers. Table 2.1 represents the number and percentage of sex of non-disabled drivers, their education levels and driving habits in a given time. There were 221 male non-disabled drivers (63.3%) and 128 female non-disabled drivers (36.7%). Education level was ranged from elementary school to graduate degree. In more specific terms; 8 of the participants had elementary school degree (2.3%), 47 of them had high school degree (13.5%), 26 of them had vocational school degree (7.4%), 220 of them bachelor degree (63%), 47 of them had graduate degree (13.5%) and lastly 1 of them reported to be a specialist in the field of medicine (.3%). In addition to this, participants were asked to report their usual driving habits by using 5 different time choice; driving nearly in every day ($N = 187$, 53.6%), driving in 3 or 4 days of a week ($N = 65$, 18.6%), driving 1 or 2 days of a week ($N = 41$, 11.7%), driving few times in a month ($N = 37$, 10.6%) and driving rarely ($N = 19$, 5.4%).

As seen in Table 2.2, the mean age of non-disabled drivers was 32.32 ($SD = 12.00$, range = 18-75) and they had 10.65 years of driving experience in average ($SD = 9.48$, range = .08-44). The mean of annual kilometer of non-disabled drivers was 10229.00 ($SD= 18956.06$, range = 5-300000). The participants' mean number of active accident involvement was .70 ($SD= 1.28$, range = 0-15); and passive accident involvement was .44 ($SD= .90$, range = 0-6). Lastly, the mean number of traffic penalties was .25 for wrong parking ($SD= .74$, range = 0-8), .04 for improperly passing ($SD= .34$, range = 0-5), .60 for speeding ($SD= 1.18$, range = 0-8). Furthermore, some of the non-disabled drivers reported other types of penalties like passing in the red light ($N = 17$), talking on the cell phone while driving ($N = 2$), drunk driving ($N = 1$), violation of the safety lane ($N = 2$), entering the opposite line ($N = 2$), forbidden transition ($N = 2$), not fastening the seat belt ($N = 1$), violation of pedestrian crossing ($N = 1$) and violation of road signs ($N = 1$).

After obtaining approval from METU Human Subjects Ethic Committee, disability associations, blogs, social domains and wheelchair basketball teams were searched and contacted to reach disabled drivers in Turkey (see Appendix E). First of all, blogs

which are used to provide connection between disabled people were investigated and participants were informed about the study. Volunteer disabled drivers from these blogs participated to the study by using Qualtrics data gathering system via internet across Turkey. Then, different wheelchair basketball teams from different cities were reached and players who are active drivers were asked to participate to the study via internet or using paper-pencil method. Not only players of the teams but also their connections in the social life helped researcher to reach volunteer participants. Each participant who could not use online system was visited by the researcher and informed consent (see Appendix F), demographic information form (see Appendix G) and survey package were delivered by hand. Some wheelchair basketball teams playing outside of Ankara were contacted by using two different ways. First of all, their basketball match dates played in Ankara were followed and the players were visited in basketball court. As the second way, the survey package was sent to their basketball club address and they requested to send it back in prescribed time.

In the second part of the study non-disabled drivers were asked to participate to the present study. Active drivers from different cities of Turkey were informed about the study by using social media tools (e.g. group blogs and media tools) and personal communications. Furthermore, students from METU and Ufuk University participated to the study. The students completed the survey gained bonus points from the related courses. The data was obtained from participants with two ways according to their accessibility; by using paper-pencil questionnaire method or using online systems (SONA participant management software and Qualtrics survey platform).

By using informed consent, participants informed that the study is based on voluntary participation and results would be used for scientific purposes. Then, survey package was given to participants. To get information about participants' age, gender, education, year of driving experience, type of the driving license, type of disability, annual kilometer, driving habits, last three years of active and passive accident involvement and lastly traffic penalty tickets of last three years, participants were asked to fill out demographic information form. Moreover, there were 5 different

questionnaires for participants; DBQ-self (drivers evaluated their own driver behaviors), DSI-self (drivers evaluated their own driver performance), DBQ-other (drivers evaluated the other group's driver behaviors), DSI-other (drivers evaluated the other group's driver performance), Attitudes towards Disabled Drivers Scale (ADDS). Disabled drivers' survey package was composed of demographic information form, DBQ-self, DSI-self, DBQ-other, DSI-other and ADDS. Similarly, non-disabled drivers' survey package was composed of demographic information form, DBQ-self, DSI-self, DBQ-other, DSI -other, ADDS. The details of the mentioned questionnaires and scales were mentioned in the following sub-sections of the Main Study.

3.2.2 Measures

3.2.2.1 The Driver Behavior Questionnaire (DBQ)

The Manchester Driver Behavior Questionnaire (DBQ) was developed by Reason and colleagues (1990) to measure aberrant driver behaviors on traffic environments. Errors, slips and lapses, ordinary violations and aggressive violations were four subscales of DBQ. The factor structure and validation analysis for the Turkish version was done by Lajunen & Özkan in 2004. This Turkish version was used for gathering data from non-professional drivers. In this study, The Positive Driver Behaviors Scale (Özkan & Lajunen, 2005) was also added the DBQ scale (see Appendix H). The questionnaire included 37 items; eight slips and lapses, eight errors, nine ordinary violations, three aggressive violations and nine positive driver behaviors. Participants evaluated their driver behaviors by using a 6-point Likert-type scale for each item (1=never, 6=always).

In the current study, the original factor structure of the DBQ was used and reliability analysis was done separately for the disabled and non-disabled driver groups. Cronbach's alpha for internal consistency scores of slips and lapses, errors, ordinary violations, aggressive violations and positive driver behaviors scale for the disabled driver group were found as follows respectively; .86, .79, .88, .70 and .90. On the other

hand, reliability analysis of non-disabled drivers showed that Cronbach's alpha for internal consistency scores of slips and lapses, errors, ordinary violations, aggressive violations and positive driver behaviors scale for the non-disabled driver group were found as follows respectively.81, .84, .84, .69 and .89.

3.2.2.2 Driver Skill Inventory (DSI)

Driver Skill Inventory (DSI) is a self-report instrument which was developed to measure technical and defensive skills of drivers. In the current study, 10-item short version of DSI was used to measure perceptual-motor skills and safety skills of drivers (Lajunen & Summala, 1995). Participants were asked to evaluate their driving skills and the other groups' driving skills by using a 5-point Likert scale (1 = very weak, 5 = very strong) (see Appendix J). In this evaluation, strong skills were represented by higher scores and weak skills were represented by lower scores. Validity and reliability analyses of the Turkish version of the DSI were confirmed (Sümer & Özkan, 2002). In the present study, the short version of the DSI with 10 items was used Participants were asked to evaluate each item on a 5-point Likert type scale (1 = very weak, 5 = very strong).

The original two factor structure of the DSI was used in the present study. Reliability analysis was performed to test internal consistency of the perceptual-motor and safety skills dimensions. This analysis was made for the disabled drivers and non-disabled drivers separately. Results showed that for disabled drivers sample Cronbach's alpha for internal consistency scores were .78 for perceptual-motor skills and .81 for safety skills. Moreover, analysis done for the non-disabled drivers' data showed that Cronbach's alpha for internal consistency scores were found as .70 for perceptual-motor skills and .76 for safety skills subscales of the DSI.

3.2.2.3 Attitudes towards Disabled Drivers Scale (ADDS)

As it was mentioned in Study-I, Chapter-II, in order to measure non-disabled drivers' and disabled drivers' attitudes towards disabled driving; 'Attitudes towards Disabled Drivers Scale (ADDS)' was developed in the present study. The scale had 50 items

with 5-point Likert-type scale (1 = totally disagree, 5 = totally agree) (see Appendix K). Higher scores represented more positive attitudes towards disabled drivers. Before performing main analysis of the study, factor structure analysis and reliability analysis of ADDS were performed. Factor analysis was conducted on the participants of the main study. The scale had four factors named as 'Adaptation to general traffic environments (ADAPT)', 'Rights of disabled drivers on traffic environments (RIGHTS)', 'Social competence in traffic environments (S-COMP)' and 'Technical competence in traffic environments (T-COMP)'. Cronbach's alpha for internal consistency scores were .90 for ADAPT and .79 for RIGHTS, .82 for S-COMP and .67 for T-COMP.

3.3 Results

3.3.1 Main Study Analyses

In the main study, in order to test the factor structures of the ADDS explanatory factor analysis was conducted. After that, the sub-scales of the DBQ, DSI and ADDS were computed. Basic descriptive statistics were conducted to see the main demographic characteristics of non-disabled and disabled drivers samples. The relationships between subscales of each questionnaire, demographic variables and DBQ self/ DSI self-measurements and the relationship between factors of all questionnaires were checked by conducting bivariate correlation analyses for both disabled drivers and non-disabled drivers separately. In addition, differences between non-disabled and disabled drivers in terms of demographic variables were tested by using independent samples t-test analysis and Pearson Chi-square test. Furthermore, differences between disabled and non-disabled drivers in terms of self/other evaluations were tested by ANCOVA. Lastly, in order to test the relationships between both ADDS subscales and DBQ-self/DSI-self scores of disabled drivers and ADDS subscales and DBQ-other/DSI-other scores of non-disabled drivers, hierarchical regression analyses were performed.

While mentioning about the findings of the study, "DBQ/DSI-self" refers to the

participants' evaluation of their own driver behaviors/skills regardless of being a non-disabled or disabled driver; "DBQ/DSI-other" refers to the participants' evaluation of the other groups' driver behaviors/skills regardless of being a non-disabled or disabled driver. For example, DSI-self evaluations of disabled drivers mean that the disabled drivers evaluated their own driving skills; however, DSI-other evaluations of the disabled drivers mean that the disabled drivers evaluated the non-disabled driving skills.

3.3.1.1 Factor structure of 'Attitudes towards Disabled Drivers Scale (ADDS)'

Factor structure of ADDS with 50 items was analyzed by using principal axis factoring (PAF) as the extraction method. As the correlation coefficients between the factors were over .30, Promax rotation was preferred (Tabachnick & Fidell, 2007). While The Kaiser-Meyer-Olkin Measure of sampling adequacy was .86, the Bartlett's test of sphericity was significant (df= 1225, $p < .001$) proving that factor analysis was deemed to be suitable with all 50 items. The numbers of factors were decided by using scree plot, eigen values and explained variance by factors. The four factor solution which explained 41% of the variance was found more appropriate because items loaded on factors meaningfully in this solution. The factor loadings under the cut-off .30 were not evaluated to obtain clearer item loadings.

A total of eleven items were eliminated to the scale (see Table 3.1). One of them which was 'Otoparktaki engelli park alanları konum, kullanım ve ulaşım kolaylığı açısından engelli sürücülere uygun planlanmıştır' (item 46) did not loaded any factors in the four factor solution. Because of the cross-loadings of the four items (item 14, 15, and 36), these items were also removed from the scale. Lastly, other six items (item 5, item 8, item 13, item 45, item 47 and item 48) were eliminated because they were not compatible with the content of the factor that they were loaded, and reliability analysis showed that if they deleted from the scale, the alpha coefficient score of the related factor would increase. Factor loadings of items, eigenvalues and the reliabilities of these factors were presented in Table 3.2.

Table 3.1. Items Deleted from the ADDS

Items	Factor 1	Factor 2	Factor 3	Factor 4
Items deleted for not being compateble with content				
5. Engelli sürücüler trafikte kendilerini korumasız hissederler		.35		
8. Trafikte araç kullanırken yakınlarımda engelli bir sürücü fark edersem daha temkinli olmam gerektiğini düşünürüm		.54		
13. Engelli sürücüler engelsiz sürücülere karşı duyarlı davranır		.32		
45. Engelli sürücüler engelsiz sürücülere göre trafik kurallarına daha fazla uyarlar			.72	
47. Engelli sürücüler için ayrılmış park yerlerinin sayısı yeterlidir	.53			
48. Sürücü kurslarında engelli sürücülerin direksiyon eğitimi için kullanılabilecek donanıma sahip araçlar bulunmaktadır	.48			
Items deleted for cross-loadings				
14. Engellerinden dolayı engelli sürücülerden araç kullanma yetkinliği konusunda belli bir noktaya kadar beklenti içinde olabiliriz	.31	.44		
15. Trafik ortamlarında engelli ve engelsiz sürücülerle aynı sıcaklıkta iletişim kurulabilir		.41		.32
36. Engelli sürücüler engelsiz sürücülerle aynı sürüş performansına sahip olmayı beklememelidir	.36			-.39
44. Engelli sürücüler her ne kadar engellerine göre düzenlenmiş araç kullansalar da, trafik ortamına engelsiz sürücüler kadar hakim olamazlar	.47			-.33
Item which were loaded any factors				
46. Otoparklardaki engelli park alanları konum, kullanım ve ulaşım kolaylığı açısından engelli sürücülere uygun planlanmıştır				

Note. Factor loadings < .3 are suppressed.

Table 3.2. Non-disabled Driver Sample-Factor loadings based on principal axis factoring analysis with promax rotation

Items	Factor 1	Factor 2	Factor 3	Factor 4
3. Engelli sürücüler trafik ortamlarında engelsiz sürücülere kıyasla daha kolay sinirlenmektedir	.42			
4. Engelli sürücüler trafikte karşılaştıkları sorunları çözme konusunda yetersizdir	.49			
9. Trafikte engelli sürücü plakalı bir araca yakın araç kullanmayı güvenli bulmuyorum	.38			
10. Aracımı park ederken engelli sürücü plakası gördüğüm araçların yanına park etmeyi güvenli bulmuyorum	.55			
11. Genel trafik düzenlemeleri engelli sürücülere göre değil de engelli olmayanlara göre yapılmalıdır	.60			
17. Engelli bir sürücü trafik ortamının güvenli ulaşım amacına olumsuz etki eder	.71			
18. Engelli insanlardan araç kullanmasını beklemek onlardan yapabileceklerinden fazlasını istemek olur	.71			
19. Engelli bir sürücünün sürücülük becerileri konusunda kendini geliştirebileceğine inanmıyorum	.41			
20. Araç kullanmak için yasal bir hakları olmasaydı engelli sürücülerin trafiğe çıkmasını engellemek isterdim	.73			
21. Engelli sürücülerin trafik kazalarına neden olma olasılığı daha yüksektir	.66			
22. Engelli sürücüler engelsiz sürücülerden daha düşük araç sürme becerisine sahiptir	.60			
25. Engelli sürücüler engelsiz sürücülere kıyasla diğer yol kullanıcılarıyla iletişimlerinde daha kompleksli davranırlar	.70			
27. Trafik ortamlarında engelli sürücülerin bulunmasının bu ortamlardaki sosyal uyumu bozduğunu düşünüyorum	.81			
28. Engelli sürücüler araç kullanırken engelsiz sürücülere oranla daha fazla hata yaparlar	.76			
29. Engelli sürücüler engelsiz sürücülere oranla daha fazla trafik ihlali yaparlar	.65			
37. Engelli sürücüler trafikte daha çok engelsiz sürücüler ile değil, diğer engelli sürücülerle etkileşim içinde olmak ister	.56			
38. Engelli bir sürücü olsaydım trafik ortamlarındaki engelsiz sürücülere kıyasla daha fazla ilgi beklentisi içinde olurdum	.43			
39. Engelli bir sürücü olsaydım trafik ortamlarındaki engelsiz sürücülere kıyasla daha fazla övgü beklentisi içinde olurdum	.56			
40. Engelli sürücülerin diğer yol kullanıcılarına yönelik davranış şekilleri rahatsız edicidir	.63			
41. Engellerinden dolayı engelli sürücülerin ehliyet alma sürecinde motor bilgisinden muaf tutulması doğru bir uygulamadır	.30			
1. Engelli sürücüleri korumak devletin görevidir		.41		
6. Engellilerin trafikte yaşadığı sorunlar tüm toplumun problemidir		.54		
7. Türkiye'de trafik ortamlarında engelli sürücülerin hareket alanı ve imkanları kısıtlıdır		.60		
12. Engelli bireylerin de sürücü belgesi alması doğru bir uygulamadır		.47		
23. Trafik ortamlarında daha fazla sayıda engelli sürücünün araç kullanabilmesine yönelik düzenlemeler yapılmalıdır		.55		
26. Ülkemizde engelli sürücülerin de trafik ortamından engelsiz sürücüler kadar faydalanabilmesi yönünde düzenlemeler yapılması için gerekli tüm kaynaklar kullanılmalıdır		.55		
30. Trafik ortamlarında uyum içinde olmak için insanlara engelli hakları konusunda eğitim verilmelidir		.48		
35. Birçok engelli sürücü kendilerine trafik ortamında daha fazla hak ve ayrıcalık tanınması gerektiğini düşünür		.50		
49. Ehliyet sınavları engelli sürücülerin engellerine uygun bir şekilde yapılmalıdır		.34		
50. Engelli sürücülerin arıza ve kaza gibi durumlarda yardım isteyebileceği özel hatlar olmalıdır		.43		
32. Engelli sürücüler trafik ortamlarında engelsiz sürücülere kıyasla daha fazla yardımcı, destekleyici ve sosyal trafik ortamını rahatlatıcı davranışta bulunurlar			.59	
33. Engelli sürücüler trafik ortamlarındaki kural ve düzenlemelere engelsiz sürücülere kıyasla daha fazla uyarlar			.76	
34. Engelli sürücüler trafik ortamlarında engelsiz sürücülerden daha az saldırgan davranış sergiler			.69	
42. Engelli sürücüler trafik ortamlarında engelsiz sürücülere göre daha saygılı davranır			.74	
43. Engelli sürücüler engelsiz sürücülere göre daha yardımseverdirler			.75	
2. Engelli sürücüler trafik becerileri açısından engelsiz sürücülerden farklı değildir				.68
16. Engelli sürücüler trafik ortamlarında engelsiz sürücülerin baş edebileceği her türlü zor durumla baş edebilirler				.59
24. Engelli sürücüler de profesyonel sürücü olarak (örn. Otobüs şoförü, taksi şoförü) çalışabilmelidir				.62
31. Engelli sürücüler de engelsiz sürücüler kadar iyi araç kullanır				.42
Eigenvalues	10.00	5.62	2.86	2.21
Percent of explained variance	20%	11%	6%	4%
Reliability	.90	.79	.82	.67

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Factor names which were defined as 'Competence in traffic environments', 'Social interaction and skills', 'Empathy for disabled drivers' and 'Rights of drivers in traffic settings' in the Study 1 section of the current study were changed after factor analysis was performed. Moreover, 11 of the total scale items were eliminated as a result of the factor analysis. These changes on the scale after the analysis of the main study data created a need to consider factor names once again based on the content of the items being loaded into each factor

The first factor which explained 20% of the total variance included twenty-five items and communalities were ranged from .30 to .81. After five of the items were eliminated, the factor composed of twenty items with the Cronbach's alpha internal for consistency score of .90. The label of this factor was determined as 'Adaptation of disabled drivers to general traffic environment (ADAPT)' considering the content of the items in this dimension. The name of this factor refers to the disabled drivers' problem solving abilities, safety concerns, driving skills, communication with other driver groups and control over the vehicle in traffic environments.

The second factor which accounted for 11% of the total variance included fifteen items and communalities were ranged from .34 to .60. Five of the items were deleted from the factor after factor analysis. The last version of the second factor included ten items with the Cronbach's alpha for internal consistency score of .79. This factor was labeled as 'Rights of disabled drivers on traffic environments (RIGHTS)' considering the content of the items in this dimension. 'Rights of disabled drivers on traffic environments' refers to the traffic regulations enabling disabled drivers' being a part of traffic environments and concerning disability people rights also in traffic settings.

The third factor explained 6% of the total variance. The item number of this factor was six with the communality range from .59 to .76. One factor was deleted from this factor because it shared the same meaning and wording with another factor. Finally, the item number of the factor consisted of ten items with the Cronbach's alpha for internal consistency score of .82. The content of items was generally related to disabled drivers' social competence in traffic environments so the factor was named as 'Social

competence in traffic environments' (S-COMP). The name of this factor represents disabled drivers' socially interactive skills and behaviors like being helpful, supportive and respectful to other road users or being compatible for traffic rules and regulations.

The last factor included seven items by accounting for 4% of the total variance. The communality values of these seven items were ranged from .42 to .68. After deleting the three items from this factor, the Cronbach's alpha for internal consistency scores of remained four factors was .67. The content of the items included by this factor was generally included disabled drivers' technical competence in traffic environments, so it was named as 'Technical competence in traffic environments (T-COMP)'. The meaning of 'Technical competence in traffic environments' refers to disabled drivers' coping skills for the problems emerging in traffic settings and general driving abilities.

The last version of ADDS, based on expert evauations in the Study 1, included 41 items for cognitive elements, 6 items for behavioral elements and 3 items for emotional elements of an attitude.

3.3.1.2 Variables of the Study: Computation of the Sub-scales and Basic Descriptive Statistics

The first study variables of the current study were Driver Behavior Questionnaire (DBQ) and positive driver behaviors questionnaire which is used together with the DBQ. This version of DBQ was evaluated as five factors which were aggressive violations, ordinary violations, errors, lapses and positive driver behaviors. The second measurement was DSI which had two factors as perceptual-motor skills and safety skills. The other measurement used in the current study was 'Attitudes towards Disabled Drivers Scale (ADDS)' which was developed in Study-I composed of four sub-scales. (ADAPT), (RIGHTS), (S-COMP) and (T-COMP). In Table 4, descriptive statistics and Cronbach's alpha for internal consistency scores for the sub-scales of DBQ, DSI and ADDS were reported.

Table 4. Computation of the Sub-scales

Study Variables	Disabled Drivers (N =189)			Non-disabled Drivers (N = 349)		
	Mean	S.D	α	Mean	S.D	α
DBQ						
Agg. Vio.	2.16	.98	.70	2.25	.95	.69
Ord. Vio	1.85	.80	.88	1.96	.75	.84
Errors	1.72	.68	.79	1.67	.66	.84
Lapses	1.68	.70	.86	1.79	.64	.81
Pos. Dri.Beh.	4.42	1.28	.90	4.65	1.06	.89
DSI						
Per-mot skills	4.01	.73	.78	3.88	.71	.70
Safety Skills	3.99	.73	.81	3.85	.67	.76
ADDS						
ADAPT	4.01	.63	.88	3.74	.60	.90
RIGHTS	3.90	.62	.72	3.97	.57	.79
S-COMP	3.81	.78	.82	3.38	.68	.72
T-COMP	3.80	.72	.45	3.43	.72	.67

NOTE: agg. vio. = aggressive violations, ord. vio = ordinary violations, positive= positive driver behaviors, percep-motor = perceptual-motor skills, safety = safety skills, ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers on traffic environments, S-COMP = Social competence in traffic environments and T-COMP = Technical competence in traffic environments

3.3.1.3 Bivariate Correlations for the Disabled Drivers Sample

Bivariate correlation analysis was done for the disabled drivers sample to test the association between the demographic variables (i.e., age, annual kilometer, accidents being involved and received penalties within the last three years) and subscales of measures (See Table 5.1 for the results of the correlation analysis). Significant relationships were reported in detail in the following sections separately for each study variable.

Table 5.1. Bivariate Correlations for Demographic Variables and Correlations Between Sub-scales of Measures in Disabled Drivers Sample

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
1.age	1																						
2.driving exp.	,64**	1																					
3. annual kilometer	-0,02	,09	1																				
4.last three year act. acc.	-,12	-,07	,18*	1																			
5.last three year pass. acc.	-,01	,05	,23**	,52**	1																		
6.agg. Vio.	-,18*	-,09	-,05	,19**	,19**	1																	
7.ord. Vio.	-,24**	-,13	,00	,19**	,14	,64**	1																
8.errors	-,09	-,13	-,13	,180*	,13	,518**	,70**	1															
9.lapses	-,12	-,144*	-,12	,155*	,08	,570**	,786**	,78**	1														
10.positive	,03	-,08	,02	,01	,02	-,04	-,11	-,158*	-,08	1													
11.other agg. Vio	-,13	-,03	-,12	,10	,07	,324**	,251**	,168*	,211**	,07	1												
12.other ord. Vio	-,146*	-,03	-,13	,05	,04	,260**	,331**	,189**	,218**	,09	,903**	1											
13.othererrors	-,13	-,08	-,13	,04	,01	,237**	,261**	,277**	,238**	,10	,834**	,900**	1										
14.otherlapses	-,11	-,07	-,163*	,08	-,01	,334**	,359**	,334**	,406**	,04	,773**	,844**	,856**	1									
15.otherpositive	-,02	,00	,179*	-,06	-,01	-,04	-,12	-,02	-,04	,201**	-,435**	-,506**	-,434**	-,377**	1								
16.percep_motor	,07	,266**	,231**	-,11	,01	-,01	-,10	-,291**	-,274**	,07	,04	,02	-,05	-,10	,06	1							
17.safety	,285**	,148*	,03	-,177*	-,06	-,243**	-,456**	-,335**	-,301**	,12	-,214**	-,331**	-,324**	-,156*	,04	,406**	1						
18.otherpercep_motor	,00	,07	,14	-,05	-,05	-,03	-,241**	-,177*	-,205**	,01	-,468**	-,532**	-,454**	-,358**	,233**	,287**	,274**	1					
19.othersafety	,05	,06	,09	-,10	-,08	-,149*	-,202**	-,04	-,06	-,178*				-,418**	,384**	,259**	,201**	,543**	1				
20.ADAPT	-,12	-,05	,06	-,02	-,05	-,03	-,07	-,323**	-,306**	,363**	,11	,13	,04	-,02	,09	,10	,10	,00	-,190**	1			
21.RIGHTS	,04	-,04	,14	,00	,00	-,11	-,07	-,11	-,06	,173*	,01	,01	,02	,00	-,05	,06	,229**	,11	,02	,09	1		
22.S-COMP	-,02	-,02	,03	-,14	,07	-,11	-,243**	-,228**	-,208**	,02	,00	-,05	-,07	-,10	,08	,191**	,261**	,269**	,12	,147**	,322**	1	
23.T-COMP	-,12	-,041	,02	-,09	-,08	,10	-,06	-,13	-,1	,086	,00	,0	-,029	,02	,04	,162*	,166*	,203**	,04	,295**	,229**	,353**	1
M	38,24	11,94	15298,72	,69	,57	2,16	1,85	1,72	1,68	4,43	2,81	2,62	2,36	2,17	3,79	4,01	3,99	3,68	3,25	4,01	3,91	3,82	3,81
SD	8,91	7,74	21668,08	1,16	1,02	,98	,80	,69	,70	1,28	1,33	1,32	1,06	,86	1,33	,73	,74	,73	1,03	,63	,62	,79	,72

* Correlation significant at the .05 level (2-Tailed). **Correlation significant at the .01 level (2-Tailed).

Note: last three years act. Acc. = last three years active accident, last three years pass. Acc. = last three years passive accident, agg. vio. = aggressive violations, ord. vio = ordinary violations,positive= positive driver behaviors, other agg. vio. = other aggressive violations, other ord. vio = other ordinary violations, otherpositive= other positive driver behaviors, percep-motor = perceptual-motor skills, safety = safety skills, other percep-motor = other perceptual-motor skills, other safety = other safety skills, ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers on traffic environments, S-COMP = Social competence in traffic environments and T-COMP = Technical competence in traffic environments

3.3.1.3.1 The Relationships between the Sub-scales of Each Questionnaire

When the relationship between the subscales of DBQ-self evaluations investigated, there were positive relationships between aggressive violations and ordinary violations ($r = .64$, $p < .01$), errors ($r = .51$, $p < .01$) and lapses ($r = .57$, $p < .01$). Similarly, ordinary violations had positive relationships with errors ($r = .70$, $p < .01$) and lapses ($r = .78$, $p < .01$). Lastly, errors were found to be positively related to lapses ($r = .78$, $p < .01$) and negatively related to positive driver behaviors ($r = -.15$, $p < .05$).

Concerning the DSI-self evaluations, the correlation analysis showed that, perceptual-motor skills and safety skills were found as positively related to each other ($r = .40$, $p < .01$).

The correlation between the DBQ factors for DBQ-other evaluations showed that when disabled drivers evaluated the non-disabled drivers' driver behaviors, aggressive violations of non-disabled drivers was positively related to ordinary violations ($r = .90$, $p < .01$), errors ($r = .83$, $p < .01$) and lapses ($r = .77$, $p < .01$) of non-disabled drivers; while it was negatively related to positive driver behaviors of them ($r = -.43$, $p < .01$). In similar ways, while ordinary violations of non-disabled drivers were positively related to errors ($r = .90$, $p < .01$) and lapses of non-disabled drivers ($r = .84$, $p < .01$), it was negatively related to positive driver behaviors of them ($r = -.50$, $p < .01$). For the other factor which was errors of non-disabled drivers, a significant and positive correlation was found for lapses of this group. On the other hand, a significant and negative correlation was found between errors ($r = .85$, $p < .01$) and lapses ($r = -.37$, $p < .01$) of non-disabled drivers and positive driver behaviors of them.

When the correlation analysis run for the subscales of DSI-other, it was shown that there was a positive relationship between evaluated perceptual-motor skills of non-disabled drivers and evaluated safety skills of that group ($r = .54$, $p < .01$).

Subscales of the ADDS was examined in disabled drivers group and it was found that there were positive relationships between ADAPT, S-COMP ($r = .14$, $p < .05$) and T-COMP ($r = .29$, $p < .01$). At the same time, RIGHTS was also positively related to S

COMP ($r = .32$, $p < .01$) and T-COMP ($r = .22$, $p < .01$). Lastly, S-COMP and T-COMP were positively related to each other ($r = .35$, $p < .01$).

3.3.1.3.2 Disabled Drivers' Demographic Characteristics in Relation to the DBQ Self, DSI Self

Bivariate correlation analysis was done for disabled drivers to examine the associations between the critical demographic variables of the study (age, annual kilometer, driving experience, active accident involvement and passive accident involvement in the last three years) and subscales of the DBQ-self and DSI self. Significant relationships were reported in following sections separately for each study variables.

First of all DBQ-self subscales and their relation to demographic variables were investigated. As the first demographic variable age was examined and it was found that age was negatively related to aggressive violations ($r = -.18$, $p < .05$) and ordinary violations ($r = -.24$, $p < .01$). As second demographic variable driving experience was examined and a negative relationship between driving experience and lapses was found ($r = -.14$, $p < .05$). Thirdly, active accident involvement in the last three years was examined and there was a positive relationship between active accident involvement in the last three years and aggressive violations ($r = .19$, $p < .01$), ordinary violations ($r = .19$, $p < .01$), errors ($r = .18$, $p < .05$) and lapses ($r = .15$, $p < .05$). Whereas passive accident involvement in the last three years was found as positively related to aggressive violations ($r = .19$, $p < .01$).

The analyses of the relationship between demographic variables and DSI-self evaluations of disabled drivers, showed that age was positively related to safety skills of drivers ($r = .28$, $p < .01$). Furthermore, driving experience was found as positively related to perceptual-motor skills ($r = .26$, $p < .01$) and safety skills of disabled drivers ($r = .14$, $p < .05$). When annual kilometer was examined, it was found that there was a positive relationship between annual kilometer and perceptual-motor skills of disabled drivers ($r = .23$, $p < .01$). On the other hand, passive accident involvement in

the last three years was found as negatively related to safety skills of disabled drivers ($r = -.17$, $p < .05$). Lastly, frequency of driving activity exhibited negative relationship with perceptual-motor skills of disabled drivers ($r = -.40$, $p < .01$).

3.3.1.3.3 The DBQ-Self Measures in Relation to the DBQ-Other Measures in the Disabled Driver Sample

The examination of the relationships between DBQ-self and DBQ-other evaluations of disabled drivers showed that aggressive violations of disabled drivers were positively related to aggressive violations ($r = .32$, $p < .01$), ordinary violations ($r = .26$, $p < .01$), errors ($r = .23$, $p < .01$), and lapses of non-disabled drivers ($r = .33$, $p < .01$). Similarly, ordinary violations of disabled drivers were found as positively related to their evaluation of the non-disabled drivers' aggressive violations ($r = .25$, $p < .01$), ordinary violations ($r = .33$, $p < .01$), errors ($r = .26$, $p < .01$), and lapses ($r = .35$, $p < .01$). In addition, positive correlations were found between errors of disabled drivers and aggressive violations ($r = .16$, $p < .05$), ordinary violations ($r = .18$, $p < .01$), errors ($r = .27$, $p < .01$) and lapses of non-disabled drivers ($r = .33$, $p < .01$). Moreover, there were positive relationships between lapses of disabled drivers and aggressive violations ($r = .21$, $p < .01$), ordinary violations ($r = .21$, $p < .01$), errors ($r = .23$, $p < .01$) and lapses of non-disabled drivers ($r = .40$, $p < .01$). Lastly, it was shown that there was a positive relationship between positive driver behaviors of disabled drivers and positive driver behaviors of non-disabled drivers ($r = .20$, $p < .01$).

3.3.1.3.4 The DSI-Self Measures in Relation to the DSI-Other Measures in the Disabled Driver Sample

The relationship between the scales of DSI-self and DSI-other measures investigated and it was found that perceptual-motor skills of disabled drivers were positively correlated with perceptual-motor skills ($r = .28$, $p < .01$) and safety skills of non-disabled drivers ($r = .25$, $p < .01$). In addition to perceptual-motor skills and safety skills of disabled drivers were positively correlated with perceptual-motor skills ($r = .27$, $p < .01$) and safety skills of non-disabled drivers ($r = .20$, $p < .01$).

3.3.1.3.5 The DBQ Self-Other Measures in Relation to the DSI Self-Other Measures in the Disabled Driver Sample

When the relationship between DBQ-self and DSI-self measures investigated, aggressive violations were found as negatively related to safety skills ($r = -.24$, $p < .01$). Similarly, ordinary violations were also found as negatively related to safety skills ($r = -.45$, $p < .01$). Moreover, errors while driving were negatively related to perceptual-motor skills ($r = -.29$, $p < .01$) and safety skills ($r = -.33$, $p < .01$). Lastly, lapses while driving showed negative relationships with perceptual-motor skills ($r = -.27$, $p < .01$) and safety skills ($r = -.30$, $p < .01$).

In the second part, the relationship between subscales of DBQ-other and DSI-other measures investigated. The results showed that there were negative relationships between aggressive violations of non-disabled drivers and perceptual-motor skills ($r = -.21$, $p < .01$) and safety skills of non-disabled drivers ($r = -.46$, $p < .01$). At the same time, there were also negative relationships between ordinary violations of non-disabled drivers and perceptual-motor skills ($r = -.33$, $p < .01$) and safety skills of them ($r = -.53$, $p < .01$). As the third DBQ factor, errors of non-disabled drivers were negatively related to perceptual-motor skills ($r = -.32$, $p < .01$) and safety skills of them ($r = -.45$, $p < .01$). And lastly lapses of non-disabled drivers was also negatively related to perceptual-motor skills ($r = -.35$, $p < .01$) and safety skills of this group ($r = -.41$, $p < .01$). On the other hand, positive driver behaviors of non-disabled drivers were positively related to perceptual-motor skills ($r = .23$, $p < .01$) and safety skills of them ($r = .38$, $p < .01$).

3.3.1.3.6 The DBQ-Self Measure in Relation to the ADDS Measures in the Disabled Driver Sample

When the correlation between DBQ-self and ADDS measures was examined, it was found that while aggressive violations were negatively correlated with ADAPT ($r = -.14$, $p < .05$), ordinary violations were negatively correlated with both ADAPT ($r = -.20$, $p < .01$) and S-COMP ($r = -.24$, $p < .01$). Similar with ordinary violations, errors

and lapses were negatively correlated with ADAPT ($r = -.32$, $p < .01$, $r = -.30$, $p < .01$) and S-COMP ($r = -.22$, $p < .01$, $r = -.20$, $p < .01$) respectively. Lastly, positive driver behaviors were positively related with ADAPT ($r = .36$, $p < .01$) and RIGHTS ($r = .17$, $p < .05$).

3.3.1.3.7 The DSI-Self Measures in Relation to the ADDS Measures in the Disabled Driver Sample

When correlation between DSI-self and ADDS measures was examined while perceptual-motor skills were positively correlated with S-COMP ($r = .19$, $p < .01$) and T-COMP ($r = .16$, $p < .05$), safety skills were positively related with RIGHTS ($r = .22$, $p < .01$), attitudes towards S-COMP ($r = .26$, $p < .01$) and T-COMP ($r = .16$, $p < .05$).

3.3.1.4 Bivariate Correlations for the Non-Disabled Drivers Sample

Bivariate correlation analysis was done for the non-disabled drivers sample to test the association between the demographic variables (i.e., age, annual kilometer, accidents being involved and received penalties within the last three years) and subscales of measures (See Table 5.2 for the results of the correlation analysis). Significant relationships were reported in detail in the following sections separately for each study variable.

Table 5.2. Bivariate Correlations for Demographic Variables and Correlations Between Sub-scales of Measures in Non-Disabled Drivers Sample

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
1.age	1																						
2.driving exp.	,930**	1																					
3. annual kilometer	,115*	,133*	1																				
4.last three year act. acc.	-,211**	-,209**	,01	1																			
5.last three year pass. acc.	-,136*	-,109*	,01	,536**	1																		
6.agg. Vio.	-,236**	-,209**	,06	,121*	,05	1																	
7.ord. Vio.	-,352**	-,297**	,10	,153**	,112*	,564**	1																
8.errors	-,239**	-,223**	-,03	,08	,02	,402**	,643**	1															
9.lapses	-,323**	-,316**	-,07	,106*	,05	,399**	,571**	,734**	1														
10.positive	,293**	,273**	,09	,02	-,02	-,128*	-,254**	-,322**	-,252**	1													
11.other agg. Vio	-,330**	-,297**	-,06	,07	,00	,340*	,253*	,276**	,286**	-,291**	1												
12.other ord. Vio	-,361**	-,321**	-,06	,06	,01	,239*	,438**	,461**	,388**	-,383**	,721**	1											
13.othererrors	-,302**	-,252**	-,10	,01	,00	,255**	,368**	,500**	,424**	-,327**	,601**	,785**	1										
14.otherlapses	-,328**	-,304**	-,130*	,05	,03	,231*	,303*	,440**	,507**	-,319**	,593**	,732**	,834**	1									
15.otherpositive	,227**	,169**	,07	,02	,07	-,156**	-,146*	-,171**	-,150*	,414**	-,371**	-,428**	-,383**	-,341**	1								
16.percep_motor	,160**	,215**	,117*	-,01	,02	,00	-,02	-,328**	-,356**	,146**	-,05	-,09	-,07	-,124*	,10	1							
17.safety	,312**	,243**	-,08	-,117*	-,09	-,278**	-,517**	-,305**	-,226**	,365**	-,136*	-,281**	-,191**	-,140**	,188**	,09	1						
18.otherpercep_motor	,136*	,107*	,02	,00	-,03	-,128*	-,07	-,141*	-,135*	,111*	-,142**	-,197**	-,298**	-,331**	,272**	,177**	,145**	1					
19.othersafety	,10	,112*	,123*	,06	,03	-,01	-,09	-,220**	-,168**	,316**	-,343**	-,442**	-,360**	-,330**	,409**	,223**	,266**	,367**	1				
20.ADAPT	,04	,06	-,03	,05	,08	-,136*	-,151**	-,287**	-,218**	,356**	-,350**	-,373**	-,430**	-,424**	,261**	,163**	,08	,210**	,308**	1			
21.RIGHTS	-,03	-,05	,05	,09	,114*	-,119*	-,185**	-,282**	-,117*	,274**	-,10	-,205*	-,154*	-,131*	,223**	,155**	,210**	,04	,282**	,232**	1		
22.S-COMP	,03	,01	,06	,01	-,05	,00	-,07	-,08	-,03	,186**	-,173**	-,213**	-,151**	-,141**	,222**	,06	,09	,153**	,396**	,01	,333**	1	
23.T-COMP	-,125*	-,130**	-,03	,10	,09	-,119*	-,05	-,165**	-,04	,110*	-,09	-,10	-,152**	-,132*	,136*	,170**	,10	,276**	,162**	,308**	,379**	,262**	1

* Correlation significant at the .05 level (2-Tailed). **Correlation significant at the .01 level (2-Tailed).

Note: last three years act. Acc. = last three years active accident, last three years pass. Acc. = last three years passive accident, agg. vio. = aggressive violations, ord. vio = ordinary violations, other agg. vio. = other aggressive violations, other ord. vio = other ordinary violations, percep-motor = perceptual-motor skills, safety = safety skills, other percep-motor = other perceptual-motor skills, other safety = other safety skills, ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers on traffic environments, S-COMP = Social competence in traffic environments and T-COMP = Technical competence in traffic environments.

3.3.1.4.1 The Relationships between the Sub-scales of Each Questionnaire

The associations among DBQ-self subscales were investigated and it was found that aggressive violations were positively correlated with ordinary violations ($r = .56$, $p < .01$), errors ($r = .40$, $p < .01$) and lapses ($r = .39$, $p < .01$) but negatively correlated with positive driver behaviors ($r = -.12$, $p < .05$). Secondly, ordinary violations were positively related to errors ($r = .64$, $p < .01$) and lapses ($r = .57$, $p < .01$) but negatively related to positive driver behaviors ($r = -.25$, $p < .01$). In addition to them, errors was positively correlated with lapses ($r = .73$, $p < .01$) and negatively correlated with positive driver behaviors ($r = -.32$, $p < .01$). Lastly, lapses negatively related to positive driver behaviors ($r = -.25$, $p < .01$).

Secondly, the associations among DSI-self subscales were investigated but there were not significant relationships between these two subscales.

In the next analysis, the bivariate correlations between subscales of DBQ-other showed that aggressive violations of disabled drivers positively correlated with ordinary violations ($r = .72$, $p < .01$), errors ($r = .60$, $p < .01$) and lapses of them ($r = .59$, $p < .01$). However, it was negatively correlated with positive driver behaviors of disabled drivers ($r = -.37$, $p < .01$). Ordinary violations of disabled drivers were positively correlated with errors ($r = .78$, $p < .01$) and lapses of them ($r = .73$, $p < .01$). However, it was negatively correlated with positive driver behaviors of disabled drivers ($r = -.42$, $p < .01$). While errors of disabled drivers was positively correlated with lapses of them ($r = .83$, $p < .01$), it was negatively correlated with positive driver behaviors of disabled drivers ($r = -.38$, $p < .01$). Lastly, lapses of disabled drivers was negatively related to positive driver behaviors of this group ($r = -.34$, $p < .01$).

The bivariate correlations between DSI-other factors showed that perceptual-motor skills of disabled drivers were positively correlated with safety skills of them ($r = .36$, $p < .01$).

Lastly, the association between subscales of ADDS were investigated and it was found that ADAPT was positively correlated with RIGHTS ($r = .23$, $p < .01$) and T-COMP

($r = .30$, $p < .01$). There were also positive relationships between RIGHTS and S-COMP ($r = .33$, $p < .01$) and T-COMP ($r = .37$, $p < .01$). Moreover, there was a positive relationship between S-COMP and T-COMP ($r = .26$, $p < .01$).

3.3.1.4.2 Non-disabled Drivers' Demographic Characteristics in Relation to the DBQ Self, DSI- Self

The bivariate correlations between demographic variables and subscales of DBQ-self were examined and it was found that age was negatively related to aggressive violations ($r = -.23$, $p < .01$), ordinary violations ($r = -.35$, $p < .01$), errors ($r = -.23$, $p < .01$) and lapses ($r = -.32$, $p < .01$). On the other hand, age was positively related to positive driver behaviors ($r = .29$, $p < .01$). At the same time, driving experience was also negatively related to aggressive violations ($r = -.20$, $p < .01$), ordinary violations ($r = -.29$, $p < .01$), errors ($r = -.22$, $p < .01$) and lapses ($r = -.31$, $p < .01$). However, it was positively related with positive driver behaviors ($r = .27$, $p < .01$). In addition, while active accident involvement in the last three years was positively correlated with aggressive violations ($r = .12$, $p < .05$), ordinary violations ($r = .15$, $p < .01$) and lapses ($r = .10$, $p < .05$); passive accident involvement in the last three years was positively correlated with only ordinary violations ($r = .11$, $p < .05$).

When the bivariate correlations between demographic variables and subscales of DSI-self, age was found as positively related to perceptual-motor skills ($r = .16$, $p < .01$) and safety skills ($r = .31$, $p < .01$). In the same way, driving experience was positively correlated with perceptual-motor skills ($r = .21$, $p < .01$) and safety skills ($r = .24$, $p < .01$). Lastly while annual kilometer was positively related to perceptual-motor skills ($r = .11$, $p < .05$), active accident involvement in the last three years was negatively correlated with safety skills ($r = -.11$, $p < .05$).

3.3.1.4.3 The DBQ-Self Measures in Relation to the DBQ-Other Measures in the Non-disabled Drivers Sample

The bivariate correlation analysis was run for DBQ-self and DBQ-other measures. Results showed that aggressive violations of non-disabled drivers were positively

correlated with aggressive violations ($r = .34$, $p < .01$), ordinary violations ($r = .23$, $p < .01$), errors ($r = .25$, $p < .01$) and lapses of disabled drivers ($r = .23$, $p < .01$). However, it was negatively correlated with positive driver behaviors of disabled drivers ($r = -.15$, $p < .01$). Secondly, ordinary violations of non-disabled drivers were positively related to aggressive violations ($r = .25$, $p < .01$), ordinary violations ($r = .43$, $p < .01$), errors ($r = .36$, $p < .01$) and lapses of disabled drivers ($r = .30$, $p < .01$). However, it was negatively correlated with positive driver behaviors of disabled drivers ($r = -.14$, $p < .01$). In addition to them, errors of non-disabled drivers were positively correlated with aggressive violations ($r = .27$, $p < .01$), ordinary violations ($r = .46$, $p < .01$), errors ($r = .50$, $p < .01$) and lapses of disabled drivers ($r = .44$, $p < .01$). However, it was negatively correlated with evaluated positive driver behaviors of disabled drivers ($r = -.17$, $p < .01$). In the same way, lapses of non-disabled drivers were positively correlated with aggressive violations ($r = .28$, $p < .01$), ordinary violations ($r = .38$, $p < .01$), errors ($r = .42$, $p < .01$) and lapses of disabled drivers ($r = .50$, $p < .01$). However, it was negatively correlated with positive driver behaviors of this group ($r = -.15$, $p < .01$). Lastly, positive driver behaviors of non-disabled drivers were found as negatively correlated with aggressive violations ($r = -.29$, $p < .01$), ordinary violations ($r = -.38$, $p < .01$), errors ($r = -.32$, $p < .01$) and lapses of disabled drivers ($r = -.31$, $p < .01$). However, it was positively correlated with positive driver behaviors of disabled drivers ($r = .41$, $p < .01$).

3.3.1.4.4 The DSI-Self Measures in Relation to the DSI-Other Measures in the Non-disabled Drivers Sample

In this part, bivariate correlation analysis was run for the relationship between DSI-self and DSI-other measures. Results indicated that perceptual-motor skills of non-disabled drivers were positively correlated with perceptual-motor skills ($r = .17$, $p < .01$) and safety skills of disabled drivers ($r = .22$, $p < .01$). In addition, safety skills of non-disabled drivers were positively correlated with perceptual-motor skills ($r = .14$, $p < .01$) and safety skills of disabled drivers ($r = .26$, $p < .01$).

3.3.1.4.5 The DBQ Self-Other Measures in Relation to the DSI Self-Other Measures in the Non-disabled Drivers Sample

The bivariate correlation analysis was run for DBQ-self and DSI-self measures to see the relationship between these two scales. Aggressive violations were negatively related to safety skills ($r = -.27$, $p < .01$). Likewise aggressive violations, ordinary violations were negatively related to safety skills ($r = -.51$, $p < .01$). In addition, errors while driving were negatively correlated with perceptual-motor skills ($r = -.32$, $p < .01$) and safety skills ($r = -.30$, $p < .01$). Lapses while driving were also negatively correlated with perceptual-motor skills ($r = -.35$, $p < .01$) and safety skills ($r = -.22$, $p < .01$). Lastly, positive driver behaviors positively correlated with perceptual-motor skills ($r = .14$, $p < .01$) and safety skills ($r = .36$, $p < .01$).

The relationship between DBQ-other and DSI-other scales showed that there was significant relationship between these two scales' subscales. Aggressive violations of disabled drivers were negatively correlated with perceptual-motor skills ($r = -.14$, $p < .01$) and safety skills of them ($r = -.34$, $p < .01$). Likewise, aggressive violations, ordinary violations of disabled drivers were negatively related to perceptual-motor skills ($r = -.19$, $p < .01$) and safety skills of this group ($r = -.44$, $p < .01$). Thirdly, errors of disabled drivers were negatively related to perceptual-motor skills ($r = -.29$, $p < .01$) and safety skills of them ($r = -.36$, $p < .01$). At the same time lapses of disabled drivers were negatively related to perceptual-motor skills ($r = -.33$, $p < .01$) and safety skills of disabled drivers ($r = -.33$, $p < .01$). On the other hand, positive driver behaviors of disabled drivers were positively related to perceptual-motor skills ($r = .27$, $p < .01$) and safety skills of this group ($r = .40$, $p < .01$).

3.3.1.4.6 The DBQ-Other Measure in Relation to the ADDS Measures in the Non-disabled Drivers Sample

Bivariate correlation analysis was done for the relationship between DBQ-other and ADDS measures. It was found that aggressive violations of disabled drivers were negatively correlated with ADAPT ($r = -.35$, $p < .01$) and S-COMP ($r = -.17$, $p < .01$).

In addition to this, ordinary violations of disabled drivers were negatively related to ADAPT ($r = -.37, p < .01$), RIGHTS ($r = -.20, p < .01$) and S-COMP ($r = -.21, p < .01$). Non-disabled drivers' evaluation for errors of disabled drivers were negatively correlated with ADAPT ($r = -.43, p < .01$), RIGHTS ($r = -.15, p < .01$), S-COMP ($r = -.15, p < .01$) and T-COMP ($r = -.15, p < .01$). Furthermore, lapses of disabled drivers were negatively correlated with ADAPT ($r = -.42, p < .01$), RIGHTS ($r = -.13, p < .05$), S-COMP and ($r = -.14, p < .01$), T-COMP ($r = -.13, p < .05$). Lastly, positive driver behaviors of disabled drivers were positively correlated with ADAPT ($r = .26, p < .01$), RIGHTS ($r = .22, p < .01$), S-COMP ($r = .22, p < .01$) and T-COMP ($r = .13, p < .05$).

3.3.1.4.7 The DSI-Other Measure in Relation to the ADDS Measures in the Non-disabled Drivers Sample

Bivariate correlation analysis was done for the relationship between DSI-other and ADDS measures. Results showed that perceptual-motor skills of disabled drivers were positively related to ADAPT ($r = .21, p < .01$), S-COMP ($r = .15, p < .01$) and T-COMP ($r = .17, p < .01$). Moreover, safety skills of disabled drivers were positively related to ADAPT ($r = .30, p < .01$), RIGHTS ($r = .28, p < .01$), S-COMP ($r = .39, p < .01$) and T-COMP ($r = .16, p < .01$).

3.3.1.5 Comparison of Disabled and Non-disabled Drivers on the Main Demographic Variables

In order to compare disabled and non-disabled drivers in terms of age and annual kilometer a series of independent samples t-test were performed. Additionally, to compare disabled and non-disabled drivers in terms of sex, number of accidents and number of penalties in the last three years, cross-tab Chi-Square analyses were performed.

3.3.1.5.1 Independent Samples T-test for Age & Annual Kilometer

A series of independent samples t-test analysis were performed to compare disabled drivers and non-disabled drivers in terms of age and annual kilometer. Statistically

significant results were presented in figures.

First of all, analysis showed that there were significant differences between disabled drivers and non-disabled drivers in terms of age (t (468) = 6.40, $p<$ .001). Disabled drivers' age (M = 38.24, SD = 8.90) was reported higher than non-disabled drivers (M = 32.32, SD = 12.00). It means that mean age of disabled drivers group in the current study was higher than non-disabled drivers group (as shown in Figure 1a).
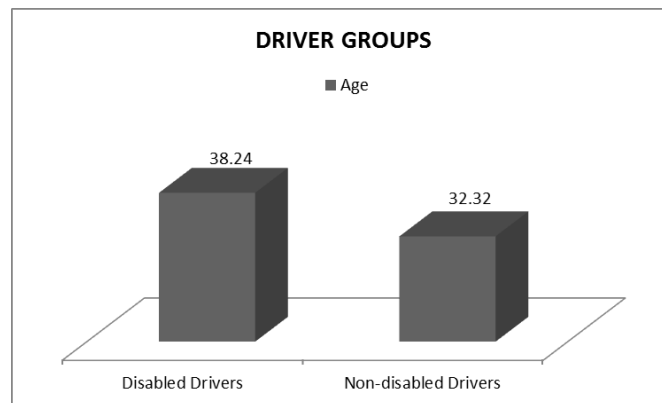
Figure 1a. Mean Scores of Disabled and Non-disabled Drivers in Terms of Age

In the second analysis, an independent samples t-test was performed to compare disabled drivers and non-disabled drivers in terms of annual kilometer reports of them. The two groups were differentiated in terms of annual kilometer (t (516) = 2.74, p < .01). Results indicated that disabled drivers (M = 15298.72, SD = 21668.08) reported more kilometer in a year than non-disabled drivers (M = 10229, SD = 18956.05) (as shown in Figure 1b).
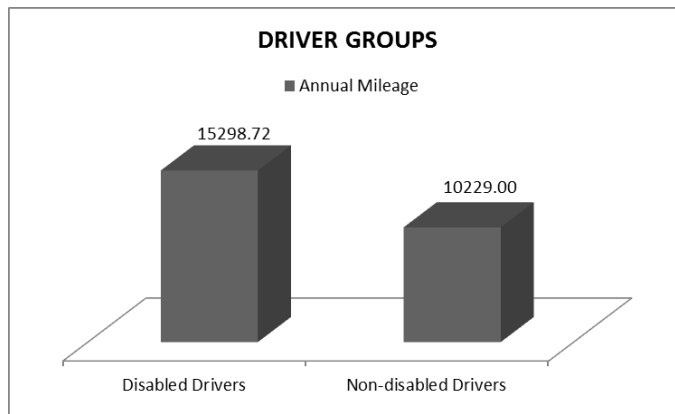
Figure 1b. Mean Scores of Disabled and Non-disabled Drivers in Terms of Annual Kilometer

3.3.1.5.2 Cross-tab and Pearson Chi-Square Test for Sex

A Cross-tab chi-square test was conducted to assess whether the frequencies of female/male participants of the study differed in the disabled driver groups and non-disabled driver groups. The analysis yielded significant results ($\chi^2(1) = 25.57$, $\Phi = .22$, $p < .001$) indicating that there is a relationship between sex and disability of the driver. In both disabled and non-disabled driver groups number of the male drivers was higher as compared to female drivers. While 19% of the female drivers were disabled drivers, 81% of them were non-disabled drivers. For the male drivers, 42% of them were disabled drivers while 58% were non-disabled drivers. Moreover, Phi tests showed that the association between these variables was moderate (See Table 6).

Table 6. Cross-tab and Pearson Chi-square Test and Descriptive Statistics for Driver Groups by Gender

Driver Groups	SEX		χ^2	Φ
	Male	Female	25.57^*	.00
Disabled Drivers	159 (42%)	30 (19%)		
Non-disabled Drivers	221 (58%)	128 (81%)		

*Note. Numbers in cells indicate number of male and female participants and number in parentheses indicate column percentages, * p < .001.*

3.3.1.5.3 Cross-tab and Pearson Chi-Square Test for the Number of Accidents

A Cross-tab chi-square test was conducted to assess whether the frequencies of number of accidents of participants in the last three years differed in the disabled driver groups and non-disabled driver groups. There were two types of accidents in the study variables. First analysis was performed for the active accident involvement in the last three years. And the second analysis was performed for passive accident involvement of them in the last three years. The results did not revealed any significant results for the differences between disabled or non-disabled drivers in terms of the association between number of active accidents or passive accidents.

3.3.1.5.4 Cross-tab Chi-Square for Number of Penalties

A Cross-tab chi-square test was conducted to assess whether the frequencies of number of penalties of participants in the last three years differed in the disabled driver groups and non-disabled driver groups. There were three types of penalties in the study variables. The first analysis was performed for parking penalties of the two groups of drivers in the last three years. The second analysis was performed for overtaking penalties of the drivers in the last three years. The last analysis was performed for the speeding penalties in the last three years of the disabled and non-disabled drivers. The results did not revealed significant differences between disabled and non-disabled drivers for any of the penalty types.

3.3.1.6 Differences of Disabled and Non-disabled Drivers on the Main Variables of the Study

3.3.1.6.1 Disabled and Non-disabled Drivers' Differences in Terms of the self-other evaluations of the DBQ

2 (driver groups) X 2 (type of the evaluation: self or other) X 5 (DBQ factors: aggressive violations, ordinary violations, errors, lapses and positive driver behaviors) mixed design ANCOVA with repeated measures on the last two factors were performed. In the analysis, age, sex and annual kilometer were treated as control

variables. The results of this analysis made it possible to compare disabled and non-disabled drivers on the self and other evaluations of the DBQ factors. Additionally, it was possible to compare these factors within themselves after controlling for the statistical effects of age, sex and annual kilometer. Pairwise Comparisons conducted to depict the differences between the five types of driver behaviors (i.e. aggressive violations, ordinary violations, errors, lapses and positive driver behaviors) were shown with letter subscripts in Table 7.1. For these differences (i.e., between types of driver behaviors) the mean scores for self and other ratings were compared by considering within group differences; and the mean scores that do not share the same number subscript on the same row indicate significant differences between the mean scores. For all other pairwise comparisons (i.e. the differences within the same type of driver behavior) the mean score that do not share the same letter subscript on the same row or on the same column are significantly different from each other.

Table 7.1. Means for Driver Behavior Questionnaire (DBQ) Factors

	Aggressive Violations		Ordinary Violations		Errors		Lapses		Positive Driver Behaviors	
	Self	*Other*	*Self*	*Other*	*Self*	*Other*	*Self*	*Other*	*Self*	*Other*
Disabled Drivers	$2.25_{a,1}$	$2.98_{b,1}$	$1.93_{a,2}$	$2.79_{b,2}$	$1.76_{a,3}$	$2.48_{c,3}$	$1.77_{a,3}$	$2.29_{b,4}$	$4.38_{b,4}$	$3.65_{d,4}$
Non-Disabled Drivers	$2.24_{a,1}$	$2.24_{a,1}$	$1.95_{a,2}$	$2.04_{a,2}$	$1.67_{a,3}$	$2.14_{b,3\text{-}1}$	$1.77_{a,4}$	$2.21_{b,3\text{-}1}$	$4.70_{a,5}$	$4.27_{c,4}$

Note. The mean scores that do not share the same number subscript on the same row are significantly different from each other.
Note. The mean scores that do not share the same latter subscript on the same row or column are significantly different from each other.

The results showed that, when disabled and non-disabled driver groups evaluated each other's driver behaviors (DBQ-other), disabled drivers reported higher aggressive violations for the other group ($M = 2.98$) than non-disabled drivers ($M = 2.24$). Similarly, disabled drivers reported more ordinary violations for the other group ($M = 2.79$) than non-disabled ones ($M = 2.04$). Lastly, disabled drivers evaluated non-disabled drivers as having more errors ($M = 2.48$) as compared non-disabled drivers' evaluation for disabled drivers on the same factor ($M = 2.14$). However, the DBQ-

other evaluation results indicated that when the concern is positive driver behaviors, non-disabled drivers ($M = 4.27$) evaluated other groups as having more positive driver behaviors as compared to the disabled drivers' evaluation of the non-disabled drivers on the same factor ($M = 3.65$). According to the results when disabled and non-disabled drivers evaluated their own driver behaviors (i.e., DBQ-self evaluations), non-disabled drivers reported higher positive driver behaviors ($M = 4.70$) than disabled ones ($M = 4.38$). For the DBQ-self evaluations, this was the only significant group difference.

Concerning the differences between disabled drivers' self-other evaluations of driver behaviors, results showed that disabled drivers evaluated non-disabled drivers as having more aggressive violations ($M = 2.98$) than themselves ($M = 2.25$). Similarly, disabled drivers evaluated non-disabled drivers as having more ordinary violations ($M = 2.79$) than themselves ($M = 1.93$). In addition, disabled drivers' evaluation of non-disabled drivers' errors ($M = 2.48$) were higher than their own errors in traffic ($M = 1.76$). Lastly, disabled drivers' evaluation of non-disabled drivers' lapses ($M = 2.29$) more than their own lapses ($M = 1.77$). On the other hand, disabled drivers reported that they have more positive driver behaviors ($M = 4.38$) than non-disabled ones ($M = 3.65$).

The results on the differences between non-disabled drivers' evaluation of their own driver behaviors and driver behaviors of disabled ones showed that there were significant self-other evaluation differences in terms of errors, lapses and positive driver behaviors. First of all, non-disabled drivers evaluated disabled drivers' errors ($M = 2.14$) as being more as compared to their own errors ($M = 1.67$). Similarly, non-disabled drivers reported that disabled drivers have more lapses in traffic settings ($M = 2.21$) than themselves ($M = 1.77$). However, in terms of positive driver behaviors, non-disabled drivers evaluated that they have more positive driver behaviors ($M = 4.70$) than disabled drivers ($M = 4.27$).

Each DBQ factors' differences between each other for self-evaluations and other evaluations were investigated separately; and this investigation was made for disabled and non-disabled driver groups separately. The results showed that the disabled drivers

self-evaluation of driver behavior frequency was ordered as follows from highest to the lowest: positive driver behaviors ($M = 4.38$), aggressive violations ($M = 2.25$), aggressive violations ($M = 2.25$), ordinary violations ($M = 1.93$), lapses ($M = 1.77$) and errors ($M = 1.76$). However, they reported that there was not a significant difference between self-evaluations of errors and lapses. On the other hand, the differences between disabled drivers' DBQ-other evaluations for all factors of DBQ showed that all factors were significantly different from each other. The results showed that the disabled drivers other-evaluation of driver behavior frequency was ordered as follows from highest to the lowest: positive driver behaviors ($M = 3.65$), aggressive violations ($M = 2.98$), ordinary violations ($M = 2.79$), errors ($M = 2.48$) and lapses ($M = 1.29$).

The analysis results representing the differences between each DBQ-self factors with which non-disabled drivers evaluated their own driver behaviors in traffic environments and DBQ-other factors with which non-disabled drivers evaluated disabled drivers' driver behaviors. DBQ-self evaluations for all factors of DBQ showed that all factors were significantly different from each other. Non-disabled drivers' self-evaluation of driver behavior frequency was ordered as follows from highest to the lowest: positive driver behaviors ($M = 4.70$), aggressive violations ($M = 2.24$), ordinary violations ($M = 1.95$) lapses ($M = 1.77$) and errors ($M = 1.67$). On the other hand, the differences between non-disabled drivers' The results showed that the non-disabled drivers other-evaluation of driver behavior frequency was ordered as follows from highest to the lowest: positive driver behaviors ($M = 4.27$) aggressive violations ($M = 2.24$), lapses ($M = 2.21$), errors ($M = 2.14$), and ordinary violations ($M = 2.04$). However, there were not significant differences in terms of aggressive violations, lapses and errors.

The interaction test revealed that a three-way interaction exists between driver group (being disabled or non-disabled drivers), evaluation type (self and other evaluations) and DBQ factors (Aggressive violations, ordinary violations, errors, lapses and positive driver behaviors). In the figures below, the factors of DBQ were plotted on the X axis. The type of evaluation (self-other) was represented by different lines, and

the last factor (being disabled or non-disabled driver) was represented by drawing two different graphs (see Figures 2a and 2b).

Figure 2a. Differences Between DBQ-self and DBQ-other Scores of Disabled Drivers

Figure 2b. Differences Between DBQ-self and DBQ-other Scores of Non-disabled Drivers

As the figure 2a shows, for the disabled drivers the difference between self-other evaluations were observed except from the lapses and error dimensions. That is, for the self- evaluations of different types of driver behaviours, only the difference between lapses and errors were not significant, all other self-evaluations, and other evaluations were significantly different from each other. It is also obvious from the Figure that, except for the positive driver behaviours, for all types of the DBQ-self evaluations of the disabled drivers, lower scores were obtained as compared to the DBQ-other evaluations of them. A similar pattern of responding was observed for the non-disabled drivers as well. All self-evaluations of the DBQ except for the evaluations of the positive driver behaviours, were lower as compared to the DBQ-other evaluations. The DBQ-self and –other evaluations of the aggressive violations factor were the same for the non-disabled behaviours. However, as it can be seen from the Figure 2b, their DBQ-self and DBQ–other evaluations for the errors and lapses dimensions showed significant differences.

3.3.1.6.2 Disabled and Non-disabled Drivers' Differences in Terms of the self-other evaluations of the DSI

2 (driver groups) X 2 (type of the evaluation: self or other) X 2 (DSI factors: perceptual-motor skills and safety skills) mixed design ANCOVA with repeated measures on the last two factors were performed. In the analysis, age, sex and annual kilometer were treated as control variables. The results of this analysis made it possible to compare disabled and non-disabled drivers on the self and other evaluations of the DSI factors. Additionally, it was possible to compare these factors within themselves after controlling for the statistical effects of age, sex and annual kilometer. Pairwise Comparisons conducted to depict the differences between the two types of driving skills (i.e. perceptual-motor skills and safety skills) were shown with letter subscripts in Table 7.2. For these differences (i.e., between types of driving skills) the mean scores for self and other ratings were compared by considering within group differences; and the mean scores that do not share the same number subscript on the same row indicate significant differences between the mean scores. For all other pairwise comparisons (i.e. the differences within the same type of driving skill) the

mean score that do not share the same letter subscript on the same row or on the same column are significantly different from each other.

Table 7.2. Means for Driver Skill Inventory (DSI) Factors

	Perceptual-motor Skills			Safety Skills	
	Self	Other		Self	Other
Disabled Drivers	$3.97_{a,1}$	$3.66_{b,1}$		$3.95_{a,1}$	$3.20_{b,2}$
Non-disabled Drivers	$3.94_{a,1}$	$3.15_{a,1}$		$3.88_{a,1}$	$3.89_{c,2}$

Note. The mean scores that do not share the same number subscript on the same row are significantly different from each other.

Note. The mean scores that do not share the same latter subscript on the same row or column are significantly different from each other.

The results showed that, when disabled and non-disabled driver groups evaluated their own driving skills (DSI-self), there were no significant differences between these two groups in terms of both perceptual-motor skills and safety skills self-evaluations. That is, disabled drivers' self-evaluation for perceptual-motor skills *(M = 3.97)* and safety skills *(M = 3.95)* were not different from non-disabled drivers' self-evaluation for perceptual-motor skills *(M = 3.94)* and safety skills *(M = 3.88)*. However, when disabled and non-disabled drivers evaluated the other groups' driving skills (DSI-other), it was reported that non-disabled drivers' evaluation of the other group's (i.e., disabled drivers) safety skills *(M = 3.89)* as being stronger as compared to the disabled drivers' evaluation of the safety skills *(M = 3.20)* of the non-disabled ones. On the other hand, disabled drivers' evaluation of the other group's (i.e., non-disabled drivers) perceptual motor skills *(M = 3.66)* as being stronger as compared to the non-disabled drivers' evaluation of the perceptual-motor skills *(M = 3.15)* of the disabled ones.

Concerning the differences between disabled drivers' evaluation of their own driving skills and their evaluation of non-disabled drivers' driving skills showed that disabled drivers evaluated themselves as having stronger perceptual-motor skills *(M = 3.97)*

and safety skills *(M = 3.95)* as compared to their evaluations of non-disabled drivers' perceptual motor skills *(M = 3.66)* and safety skills *(M = 3.20).* Similarly, the comparison for the non-disabled drivers' evaluation of their own driving skills and their evaluation for disabled drivers' driving skills was made. The results showed that while non-disabled drivers evaluated their own perceptual-motor skills as being stronger *(M = 3.94)* as compared to their perceptual-motor *(M = 3.88)* evaluation for disabled drivers; there were no differences between non-disabled drivers' self *(M = 3.15)* evaluation and other *(M = 3.89)* in terms of safety skills.

The ANCOVA also gave information on the differences between self and other evaluations of the two sub-scales of the DSI for both groups of drivers. For the disabled drivers, the results showed that there were no significant differences between DSI-self evaluations of perceptual-motor skills *(M = 3.97)* and safety skills *(M = 3.95).* However, the results showed that, disabled drivers evaluated the driving skills of non-disabled drivers as being stronger in perceptual-motor skills *(M = 3.66)* as compared to the same evaluation for safety skills *(M = 3.20).*

Differences between self and other evaluations of the two sub-scales of the DSI were also tested for the non-disabled drivers. The results showed that there were no significant differences between DSI-self evaluations of perceptual-motor skills *(M = 3.94)* and safety skills *(M = 3.88).* However, the results showed that, non-disabled drivers evaluated the driving skills of disabled drivers' as being stronger in safety skills *(M = 3.89)* as compared to the same evaluation for perceptual-motor skill *(M = 3.15).*

The interaction test revealed that a three-way interaction exists between driver groups (being disabled or non-disabled drivers), evaluation type (self and other evaluations) and DSI sub-dimensions (Perceptual-motor Skills and Safety Skills). In the figures below, the sub-dimensions of DSI were plotted on the X axis. The type of evaluation (self-other) was represented by different lines, and the last factor (being disabled or non-disabled driver) was represented by drawing two different graphs (see Figures 3a and 3b).
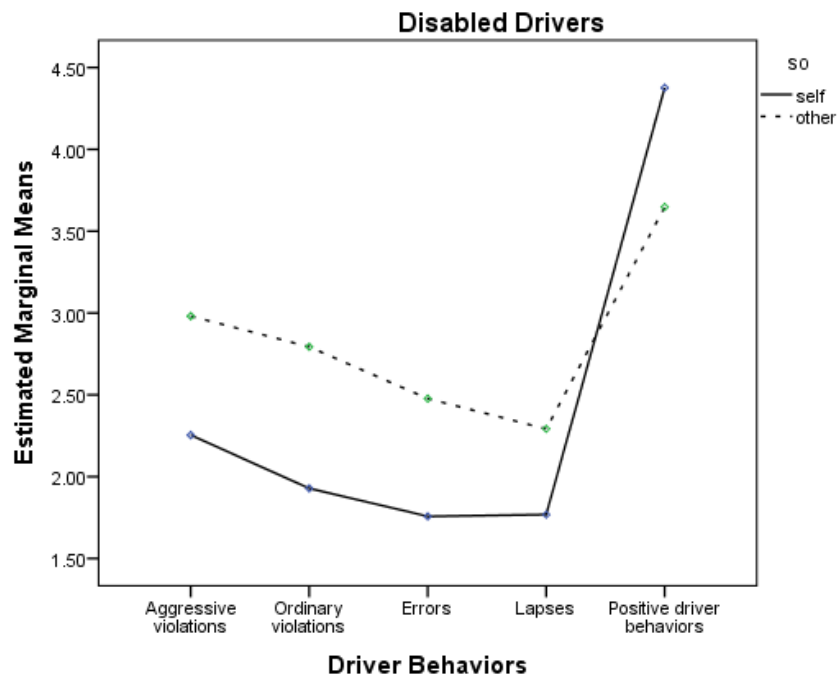
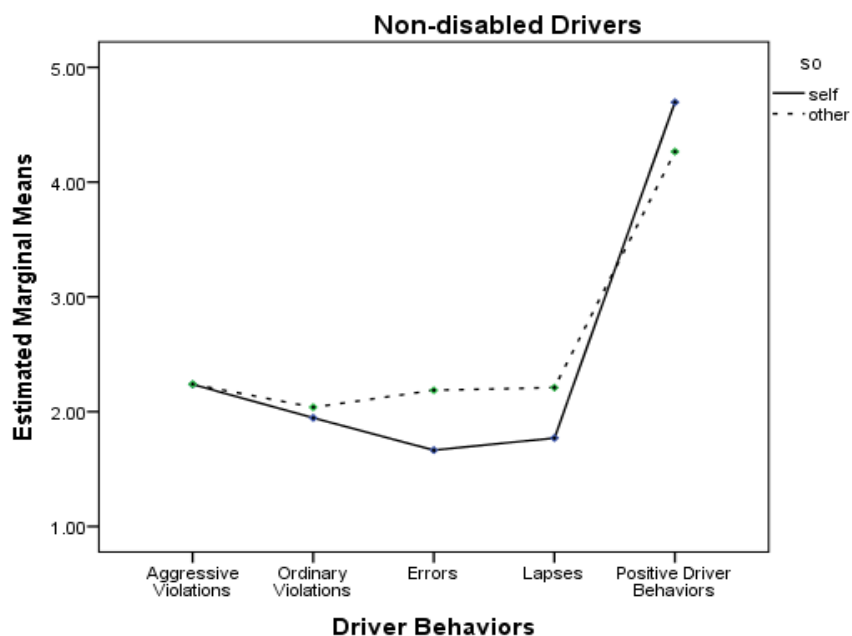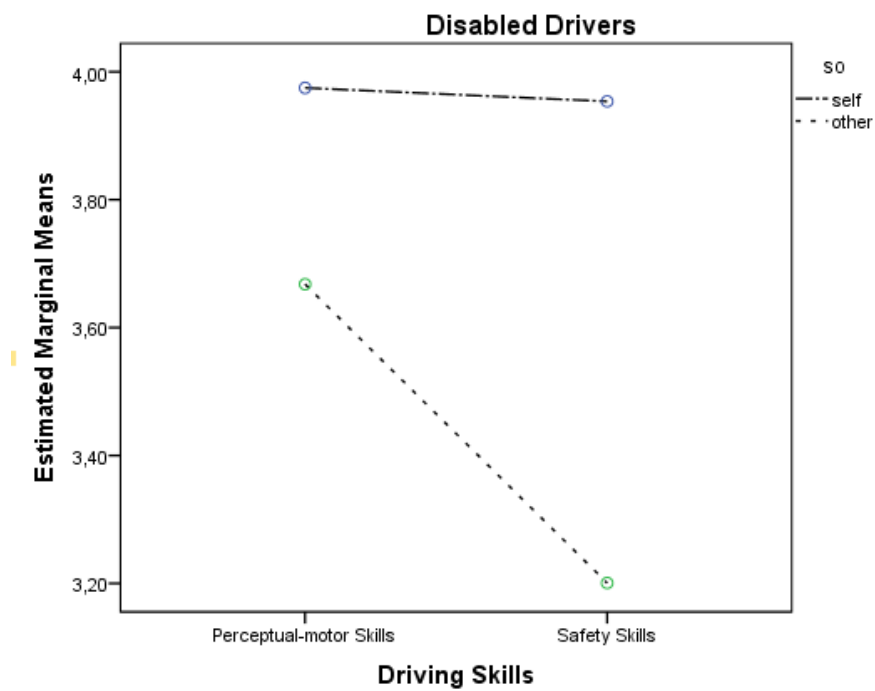Figure 3a. Differences Between DSI-self and DSI-other Scores of Disabled Drivers
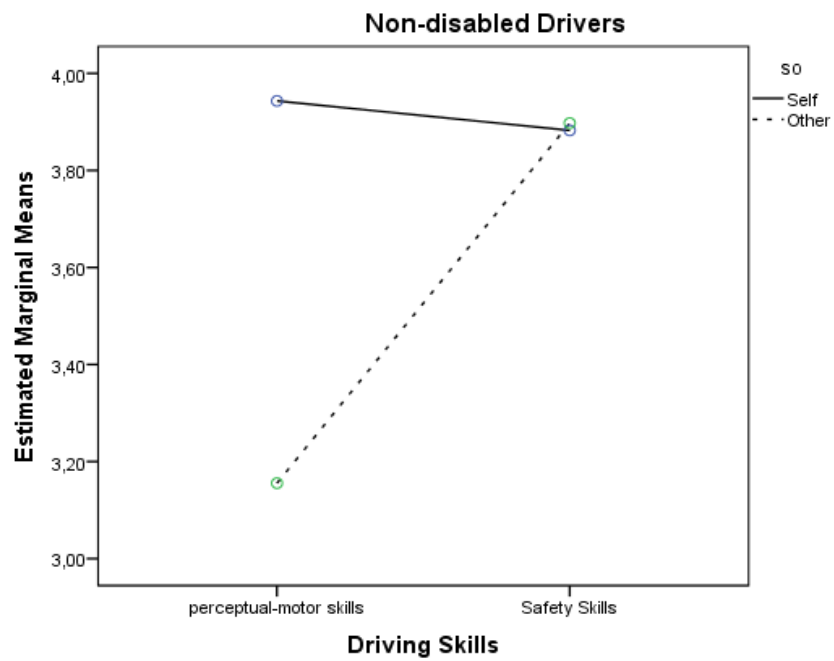
Figure 3b. Differences Between DSI-self and DSI-other Scores of Non-disabled Drivers

As the Figure 3a shows, for the disabled drivers, self and other evaluations for both perceptual-motor skills and safety skills were reported as stronger for self-evaluations of the DSI. However, there is a dramatic difference between their other perceptual-motor skills and safety skills evaluations. The highest score in the DSI evaluations of the disabled drivers was for the self-evaluations of the perceptual-motor skills, while the lowest score by disabled drivers was given to the safety skills of the non-disabled drivers. For the results concerning the self-other DSI evaluations of the non-disabled drivers (see Figure 3b), it is observed that although there is a clear difference between the self and other ratings of perceptual-motor skills, the self and other evaluations for the safety skills were almost the same. The non-disabled drivers perceived themselves as stronger in perceptual motor skills as compared to the non-disabled drivers; however, they did not evaluate the safety skills of these two groups of drivers as being different.

3.3.1.6.3 Disabled and Non-disabled Drivers' Differences in Terms of the ADDS Scores

One-way ANOVA analysis was conducted to compare the disabled and non-disabled drivers on the four sub-scales of the ADDS (i.e., Adaptation of disabled drivers to general traffic environment (ADAPT), Rights of disabled drivers on traffic environments (RIGHTS), Social competence in traffic environments (S-COMP) and Technical competence in traffic environments (T-COMP).

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Table 7.3. Means for ADDS scores of Disabled and Non-disabled Drivers

Source	Disabled Drivers' Mean N = 189	Non-Disabled Drivers' Mean N = 349	F
1.ADAPT	4.01	3.74	22.35[*]
2.RIGHTS	3.80	3.73	3.15
3.S-COMP	3.81	3.38	45.36[*]
4.T-COMP	3.80	3.43	32.60[*]

*Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments *p < .001*

The results (see Table 7.3) indicated that significant differences existed between disabled and non-disabled drivers for the first factor of ADDS which named as ADAPT (F (1, 536) = 22.35, $p < .001$). It was shown that disabled drivers ($M = 4.01$, $SD = .634$) had more positive attitudes towards adaptation of disabled drivers to general traffic environments than non-disabled drivers ($M = 3.74$, $SD = .609$). Similarly, disabled and non-disabled drivers significantly differed from each other on another factor of ADDS which named as 'S-COMP (F (1, 536) = 45.36, $p < .001$). In terms of attitudes towards social competence of disabled drivers in traffic environments, again disabled drivers ($M = 3.81$, $SD = .789$) had more positive attitudes than non-disabled ones ($M = 3.38$, $SD = .681$). Results also showed that in the T-COMP sub-scale of the ADDS, there were significant differences between disabled and non-disabled drivers. Disabled drivers ($M = 3.80$, $SD = .720$) reported more positive attitudes towards technical competence of disabled drivers in traffic environments than non-disabled ones ($M = 3.43$, $SD = .728$). However, for the RIGHTS factor, the results did not yield significant differences between disabled and

non-disabled drivers.

3.3.1.7 Hierarchical Regression Analysis for the Disabled Drivers Group

3.3.1.7.1 The Relationship between ADDS Subscales and DBQ-self Scores for the Disabled Drivers

A total of five hierarchical regression analyses were performed with ADDS factors (ADAPT, RIGTHS, S-COMP and T-COMP) as predictors. Moreover, in each analysis, DV was one of the DBQ-self factors which included self-reports of disabled drivers in terms of their driver behaviors. In all hierarchical regression analyses; in the first step age, sex and annual kilometer of drivers were entered to be controlled for their statistical effects. (See Table 8.1)

Table 8.1. Summary of Separate Regression Analyses with ADDS Subscales and DBQ-self Scores after Controlling for Age, Gender and Annual Kilometer

DV: DBQ Aggressive Violations	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.038	.038		.094
Age			-.166	.032
Gender			.117	.138
Annual Kilometer			-.068	.380
2nd Step: ADDS Scale	.104	.066		.012
1st factor: ADAPT			-.213	.008
2nd factor: RIGHTS			.032	.687
3rd factor: S-COMP			-.156	.059
4th factor: T-COMP			.181	.032
DV: DBQ Ordinary Violations	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.065	.065		.011
Age			-.243	.002
Gender			.116	.136
Annual Kilometer			-.025	.002
2nd Step: ADDS Scale	.193	.129		.000
1st factor: ADAPT			-.256	.001
2nd factor: RIGHTS			.054	.475
3rd factor: S-COMP			-.273	.001
4th factor: T-COMP			.086	.281
DV: DBQ errors	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.024	.024		.255
Age			-.089	.253
Gender			.065	.411
Annual Kilometer			-.131	.097
2nd Step: ADDS Scale	.171	.147		.000
1st factor: ADAPT			-.321	.000
2nd factor: RIGHTS			-.013	.867
3rd factor: S-COMP			-.180	.024
4th factor: T-COMP			.013	.875
DV: DBQ lapses	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.030	.030		.167
Age			-.113	.147
Gender			.022	.780
Annual Kilometer			-.139	.076
2nd Step: ADDS Scale	.166	.135		.000
1st factor: ADAPT			-.296	.000
2nd factor: RIGHTS			.047	.544
3rd factor: S-COMP			-.226	.005
4th factor: T-COMP			.043	.592
DV: DBQ-Positive driver behaviors	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.023	.023		.287
Age			.002	.982
Gender			.151	.057
Annual Kilometer			-.045	.566
2nd Step: ADDS Scale	.230	.207		.000
1st factor: ADAPT			.463	.000
2nd factor: RIGHTS			.124	.093
3rd factor: S-COMP			-.068	.373
4th factor: T-COMP			-.148	.058

Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments

The first analysis was performed to see which factors of ADDS predicted disabled drivers' self-reported aggressive violations. Analyses showed that while ADAPT dimension of ADDS was negatively related to aggressive violations ($\beta = -.21$, $t = -2.68$, $p < .05$), T-COMP was ($\beta = .18$, $t = 2.16$, $p < .05$) positively related to it. It means that disabled drivers who had positive attitudes towards adaptation of disabled drivers to general traffic environments reported more aggressive violations then others. On the other hand, disabled drivers who had positive attitudes towards technical competence of disabled drivers in traffic environments reported less aggressive violations.

In the second analysis, the regression analysis was conducted by entering ordinary violations as DV. According to results, ADAPT ($\beta = -.26$, $t = -3.39$, $p < .01$) and S-COMP ($\beta = -.27$ $t = -3.50$, $p < .01$) dimensions of the ADDS were negatively related to self-reported ordinary violations of disabled drivers. Results showed that disabled drivers having stronger attitudes concerning general adaptation of disabled drivers to traffic environment and their social competence in that environment reported less ordinary violations.

The third analysis was performed to see the relationship between ADDS dimensions and disabled drivers' self-reported errors. According to the results, the ADAPT ($\beta = -.32$, $t = -4.20$, $p < .001$) and S-COMP ($\beta = -.18$, $t = -2.27$, $p < .05$) dimensions of the ADDS were negatively related to self-reported errors of disabled drivers. That is, the disabled drivers having stronger attitudes concerning general adaptation of disabled drivers to traffic environment and their social competence in that environment reported lower frequencies of errors.

In the fourth analysis, the DV was the self-evaluations of lapses factor of DBQ. Results indicated that ADAPT ($\beta = -.30$, $t = -3.86$, $p < .001$) and S-COMP ($\beta = -.23$, $t = -2.84$, $p < .01$) dimensions of the ADDS were negatively related to self-reported lapses of disabled drivers. That is, the disabled drivers having stronger attitudes concerning general adaptation of disabled drivers to traffic environment and their social competence in that environment reported lower frequencies of lapses.

Lastly, in the last hierarchical regression analysis the ADDS dimensions were investigated in relation to self-evaluation of positive driver behaviors of disabled drivers. Results showed that the ADAPT dimension of the ADDS was positively related to positive behaviors of the disabled drivers ($\beta = .46$, $t = 6.28$, $p < .001$). That is, the disabled drivers having stronger attitudes concerning general adaptation of disabled drivers reported higher frequencies of positive driver behaviors.

3.3.1.7.2 The Relationship between ADDS Subscales and DSI-self Scores for the Disabled Drivers

Two different hierarchical regression analyses were performed to test the relationships between ADDS factors (ADAPT, RIGHTS, S-COMP and T-COMP) and self-evaluation of DSI dimensions (perceptual-motor skills and safety skills). In each analysis, DV was one of the DSI dimensions; and the statistical effects of age, sex and annual kilometer of drivers were controlled by entering these variables in the first step of the analysis. The IVs of the analyses were the four dimensions of the ADDS (see Table 8.2)

Table 8.2. Summary of Separate Regression Analyses with ADDS Subscales and DSI-self Scores after Controlling for Age, Gender and Annual Kilometer

DV: DSI perceptual-motor skills	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.061	.061		.016
Age			.047	.540
Gender			.084	.282
Annual Kilometer			.211	.007
2nd Step: ADDS Scale	.129	.068		.016
1st factor: ADAPT			.089	.259
2nd factor: RIGHTS			-.151	.056
3rd factor: S-COMP			.214	.009
4th factor: T-COMP			.050	.544
DV: DSI safety skills	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.110	.110		.000
Age			.310	.000
Gender			-.166	.029
Annual Kilometer			.030	.693
2nd Step: ADDS Scale	.199	.089		.000
1st factor: ADAPT			.111	.140
2nd factor: RIGHTS			.085	.262
3rd factor: S-COMP			.217	.006
4th factor: T-COMP			.012	.875

Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments

For the first hierarchical regression analysis, the relationships between perceptual motor skills and ADDS dimensions were tested. Results indicated that S-COMP dimension of the ADDS was positively related to the perceptual-motor skills dimension of DSI ($\beta = .21$, $t = 2.63$, $p < .05$). That is, the disabled drivers having stronger attitudes concerning social competence of disabled drivers reported stronger perceptual-motor skills.

In the second hierarchical regression analysis, the relationships between safety skills and ADDS dimensions were tested. The S-COMP dimension of the ADDS was related to the safety skills dimension of DSI ($\beta = .22$, $t = 2.79$, $p < .05$). That is, the disabled drivers having stronger attitudes concerning social competence of disabled drivers reported stronger safety skills.

Table 8.3 shows the summary of the results of all hierarchical regression analyses which were performed to test both relationships between ADDS factors (ADAPT, RIGHTS, S-COMP and T-COMP) and self-evaluation of DBQ dimensions (aggressive violations, ordinary volations, errors, lapses and positive driver behaviors) and the relationships between ADDS factors (ADAPT, RIGHTS, S-COMP and T-COMP) and self-evaluation of DSI dimensions (perceptual-motor skills and safety skills) for the disabled drivers sample.

Table 8.3 Summary of the Regression Analyses (for the Disabled Drivers): Relationships between Study Variables

DBQ-AggressiveViolations (DV)	
ADAPT (IV)	Negatively Related
T-COMP (IV)	Positively Related
DBQ-Ordinary Violations (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Errors (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Lapses (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Positive Driver Behaviors (DV)	
ADAPT (IV)	Positively Related
DSI-Perceptual-motor Skills (DV)	
S-COMP (IV)	Positively Related
DSI-Safety Skills (DV)	
S-COMP (IV)	Positively Related

Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments

3.3.1.8 Hierarchical Regression Analysis for the Non-Disabled Drivers Group

3.3.1.8.1 The Relationships between ADDS Dimensions and DBQ-other evaluations for the Non-Disabled Drivers Sample

A total of five hierarchical regression analyses were performed with ADDS factors (ADAPT, RIGTHS, S-COMP and T-COMP) as predictors. Moreover, in each analysis, DV was one of the DBQ-other factors which included self-reports of disabled drivers in terms of their driver behaviors. In all hierarchical regression analyses; in the first step age, sex and annual kilometer of drivers were entered to be controlled for their statistical effects (see Table 9.1).

Table 9.1. Summary of Separate Regression Analyses with ADDS Subscales and DBQ-other Scores after Controlling for Age, Gender and Annual Kilometer

DV: DBQ-other Aggressive Violations	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.111	.111		.000
Age			-.331	.000
Gender			.039	.454
Annual Kilometer			-.030	.562
2nd Step: ADDS Scale	.250	.139		.000
1st factor: ADAPT			-.345	.000
2nd factor: RIGHTS			.025	.659
3rd factor: S-COMP			-.171	.001
4th factor: T-COMP			.010	.860
DV: DBQ-other Ordinary Violations	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.141	.141		.000
Age			-.371	.000
Gender			.104	.044
Annual Kilometer			-.032	.536
2nd Step: ADDS Scale	.310	.168		.000
1st factor: ADAPT			-.350	.000
2nd factor: RIGHTS			-.077	.149
3rd factor: S-COMP			-.186	.000
4th factor: T-COMP			.045	.398
DV: DBQ-other errors	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.104	.104		.000
Age			-.305	.000
Gender			.098	.063
Annual Kilometer			-.074	.158
2nd Step: ADDS Scale	.294	.190		.000
1st factor: ADAPT			-.406	.000
2nd factor: RIGHTS			.001	.980
3rd factor: S-COMP			-.129	.011
4th factor: T-COMP			-.030	.579
DV: DBQ-other lapses	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.117	.117		.000
Age			-.314	.000
Gender			-.027	.600
Annual Kilometer			-.089	.088
2nd Step: ADDS Scale	.308	.191		.000
1st factor: ADAPT			-.414	.000
2nd factor: RIGHTS			-.015	.785
3rd factor: S-COMP			-.116	.021
4th factor: T-COMP			-.009	.860
DV: DBQ-other Positive driver behaviors	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.054	.054		.000
Age			.221	.000
Gender			.003	.960
Annual Kilometer			.049	.365
2nd Step: ADDS Scale	.177	.123		.000
1st factor: ADAPT			.226	.000
2nd factor: RIGHTS			.132	.025
3rd factor: S-COMP			.167	.002
4th factor: T-COMP			.002	.976

Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments

The first analysis was performed to see which factors of ADDS predicted non-disabled drivers' evaluations of aggressive violations of disabled drivers on DBQ-other factors. According to results, Only ADAPT ($\beta = -.35$, $t = -6.73$, $p < .01$) and S-COMP ($\beta = -.17$, $t = -3.28$, $p < .01$) factors were represented significant and negative relationship with aggressive violations of disabled drivers. This means that non-disabled drivers having positive attitudes towards adaptation and social competence of disabled drivers in traffic environments reported less aggressive violations for disabled drivers.

Secondly, the DV was evaluations of non-disabled drivers for ordinary violations of disabled drivers on DBQ-other factors. Results showed that likewise for aggressive violations, for ordinary violations only ADAPT ($\beta = -.35$, $t = -7.11$, $p < .001$) and S-COMP ($\beta = -.19$, $t = -3.72$, $p < .001$) factors were represented significant and negative relationship with ordinary violations of disabled drivers. Similar to aggressive violations, non-disabled drivers having positive attitudes towards adaptation and social competence of disabled drivers in traffic environments reported less ordinary violations for disabled drivers.

In third analysis, a hierarchical regression analysis was performed for evaluations of non-disabled drivers for errors of disabled drivers on DBQ-other factors. Similar with performed violation analyses, for errors only ADAPT ($\beta = -.41$, $t = -8.15$, $p < .001$) and S-COMP ($\beta = -.13$, $t = -2.55$, $p < .05$) factors were represented significant and negative relationship with errors of disabled drivers It means that non-disabled drivers who had negative attitudes towards disabled drivers' adaptation to traffic environments and their social competence in traffic reported that disabled drivers had more errors.

The fourth analysis a hierarchical regression analysis was performed for evaluations of non-disabled drivers for lapses of disabled drivers on DBQ-other factors. Similar with previously performed analyses for DBQ factors, for errors only ADAPT ($\beta = -.41$, $t = -8.40$, $p < .001$) and S-COMP ($\beta = -.12$, $t = -2.31$, $p < .05$) factors represented significant and negative relationship with lapses of disabled drivers by non-disabled drivers. It means that non-disabled drivers who had negative attitudes towards disabled drivers' adaptation to traffic environments and their social competence in traffic

reported as disabled drivers had more lapses.

In the final analysis, DBQ-other evaluations of non-disabled drivers on the positive driver behaviors factor were entered as DV. According to results ADAPT ($\beta = .22$, $t = 4.20$, $p <. 001$), RIGHTS ($\beta = .13$, $t = 2.24$, $p < .05$) and S-COMP ($\beta = .17$, $t = 3.06$, $p < .01$) dimensions of ADDS predicted non-disabled drivers' evaluation of disabled drivers' positive driver behaviors. It was found that non-disabled drivers who reported positive attitudes for disabled drivers' adaptation to traffic environments, rights of disabled drivers on traffic environments and their social competence in traffic environments, reported more positive driver behaviors for disabled drivers.

3.3.1.8.2 The Relationships between ADDS Dimensions and DSI-other evaluations for the Non-Disabled Drivers Sample

Two different hierarchical regression analyses were performed to test the relationships between ADDS factors (ADAPT, RIGHTS, S-COMP and T-COMP) and other-evaluation of DSI dimensions (perceptual-motor skills and safety skills). In each analysis, DV was one of the DSI dimensions; and the statistical effects of age, sex and annual kilometer of drivers were controlled by entering these variables in the first step of the analysis. The IVs of the analyses were the four dimensions of the ADDS (see Table 9.2).

Table 9.2. Summary of Separate Regression Analyses with ADDS Subscales and DSI-other Scores after Controlling for Age, Gender and Annual Kilometer

DV: DSI-other perceptual-motor skills	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.019	.019		.093
Age			.133	.016
Gender			.021	.699
Annual Kilometer			.004	.946
2nd Step: ADDS Scale	.139	.120		.000
1st factor: ADAPT			.152	.006
2nd factor: RIGHTS			-.125	.037
3rd factor: S-COMP			.118	.035
4th factor: T-COMP			.265	.000
DV: DSI-other safety skills	R^2	R^2_{change}	Beta	p
1st Step: Control Variables	.027	.027		.027
Age			.095	.084
Gender			-.067	.221
Annual Kilometer			.122	.027
2nd Step: ADDS Scale	.276	.249		.000
1st factor: ADAPT			.297	.000
2nd factor: RIGHTS			.106	.053
3rd factor: S-COMP			.365	.000
4th factor: T-COMP			-.055	.306

Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments

In the first analysis, DV was entered as perceptual-motor skills factor of DSI-other evaluations of non-disabled drivers for disabled ones. Results indicated that while ADAPT ($\beta = .15$, $t = 2.76$, $p < .01$), S-COMP ($\beta = .12$, $t = 2.12$, $p < .05$) and T-COMP ($\beta = .27$, $t = 4.51$, $p < .001$) were found as positively related to perceptual-motor skills of disabled drivers, RIGHTS ($\beta = -.13$, $t = -2.09$, $p < .05$) was negatively related to it. It means that non-disabled drivers who reported positive attitudes towards disabled drivers' adaptation, social competence and technical competence in traffic environments reported more perceptual-motor skills for disabled drivers. On the other hand, non-disabled drivers who had positive attitudes towards rights of disabled drivers on traffic environments reported less perceptual-motor skills for disabled drivers.

In the second hierarchical regression analysis, the relationships between safety skills factor of DSI other evaluations of non-disabled drivers for disabled drivers and ADDS dimensions were tested. Results showed only two dimensions of ADDS which were

named as ADAPT ($\beta = .30$, $t = 5.88$, $p < .001$) and S-COMP ($\beta = .37$, $t = 7.15$, $p < .001$) were positively related to safety skills of disabled drivers. It means that non-disabled drivers who had positive attitudes towards adaptation and social competence of disabled drivers in traffic environments reported more safety skills for disabled drivers.

Table 9.3 shows the summary of the results of all hierarchical regression analyses which were performed to test both relationships between ADDS factors (ADAPT, RIGHTS, S-COMP and T-COMP) and other-evaluation of DBQ dimensions (aggressive violations, ordinary volations, errors, lapses and positive driver behaviors) and the relationships between ADDS factors (ADAPT, RIGHTS, S-COMP and T-COMP) and other-evaluation of DSI dimensions (perceptual-motor skills and safety skills) for the non-disabled drivers sample.

Table 9.3 Summary of the Regression Analyses (for the Non-disabled Drivers): Relationships between Study Variables

DBQ-AggressiveViolations (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Ordinary Violations (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Errors (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Lapses (DV)	
ADAPT (IV)	Negatively Related
S-COMP (IV)	Negatively Related
DBQ-Positive Driver Behaviors (DV)	
ADAPT (IV)	Positively Related
RIGHTS (IV)	Positively Related
S-COMP (IV)	Positively Related
DSI-Perceptual-motor Skills (DV)	
ADAPT (IV)	Positively Related
RIGHTS (IV)	Negatively Related
S-COMP (IV)	Positively Related
T-COMP (IV)	Positively Related
DSI-Safety Skills (DV)	
ADAPT (IV)	Positively Related
S-COMP (IV)	Positively Related

Note. ADAPT = Adaptation to general traffic environments, RIGHTS = Rights of disabled drivers, S-COMP = Social Competence in traffic environments, TGTE = Technical Competence in traffic environments

3.4 Discussion

3.4.1 Overview

In the main study, it is aimed to investigate human factors (i.e., driver behaviors and driving skills) in disabled driving, attitudes towards disabled drivers, differences between disabled and non-disabled drivers' perspectives on human factors in disabled driving and test the relationships between attitudes towards and human factors in

disabled driving. In order to make the aimed investigations the data was collected from two groups of drivers: disabled drivers and non-disabled drivers. Disabled drivers provided information on their own driver behaviors, driving skills, attitudes towards disabled drivers, in addition to giving information about the non-disabled drivers' driver behaviors and driving skills. The non-disabled drivers in this study gave information on their own driver behaviors, driving skills, and attitudes towards disabled driving. Additionally they provided information on the driver behaviors and skills of disabled drivers. After comparing demographic variables and study variables of disabled and non-disabled driver groups to understand group differences, attitudes towards disabled driving and its relation to human factors in traffic environments were investigated. Not only the relationship between non-disabled drivers' attitudes towards disabled driving and non-disabled drivers' evaluation of disabled drivers' driver behaviors and driving skills was examined but also the relationship between disabled drivers' attitudes towards disabled drivers in traffic and their evaluation of their own driver behaviors and driving skills was under the consideration of the current study. With these main aims, the present study would be a significant contribution to the literature, because there has been no attempt to understand and know disabled driving in relation to human factors in driving. Similarly, there has not been any attempt to get self and other evaluation for the human factors in driving and disabled driving. Additionally, this is the first study investigating the attitudes towards disabled driving and developing a related scale (i.e., ADDS).

In the following parts of this chapter, the results of the main study will be summarized and discussed in detail with the support from the knowledge gained from the interview sections of ADDS measure development process and main literature findings. Moreover, contributions of this study to the literature and considerations for the future studies will be presented in detail.

3.4.2 Evaluations of the Comparison of Disabled and Non-disabled Drivers on the Main Demographic Variables

In the first analysis, the association between gender of participants and being a disabled or non-disabled driver was tested. It was found that while 81% of female participants were non-disabled drivers, 58% of male drivers were non-disabled drivers. The percentage of male participants of these two driver groups can be regarded as equal. However, female participants of the disabled group nearly represent one fourth of the non-disabled female drivers. The close number of male non-disabled drivers and disabled drivers may originate from the huge number of male drivers in traffic environments. Consistent with the statement of Bener et al. (2013), there were more male drivers than female ones because of their high ratio of employment as professional drivers and having more cars. The results of the current study confirm these findings for also disabled drivers group. It can be concluded that likewise in non-disabled drivers group, minimum number of female drivers may participate in driving activity in disabled drivers' population. Another possible reason of this situation may originate from participant characteristics of disabled drivers. It means that most of the disabled driver participants were reached from wheelchair basketball teams. Although there were mixed basketball teams or the ones which are composed of only female players; most of the teams usually had male players.

Another comparison was done for number of accidents in the last three years. There were two types of accidents in the demographic variables; active accident involvement and passive accident involvement. It was found that there were no significant differences between disabled drivers and non-disabled drivers in terms of both active accident involvement and passive accident involvement. According to the literature, self-reported accident involvement data may be misinterpreted by the driver willingly or unwillingly (Elander et. al., 1993). Either interpretation differences of reportable events done by different people or simply forgetting the past accidents cause self-reported accident data represent biased reports (Lajunen & Özkan, 2011). This

literature depended on the non-disabled drivers' data. The results of the present study showed that the disabled driver data is not different from the non-disabled one.

After comparison of accident involvement in the last three years, numbers of penalties taken in the last three years were compared. There were three different penalty types: wrong parking, overtaking, and speeding. Results showed that there were no significant differences between disabled drivers and non-disabled drivers in terms of the frequency of receiving traffic penalties. This may be caused from the social desirability need of non-disabled drivers or disabled drivers' exaggerated numbers of penalty reports. It is because in the interview sections of ADDS non-disabled drivers tended to demonstrate themselves as drivers who are obeying traffic rules and regulations. On the other hand, disabled drivers tended to emphasize that they aren't different from non-disabled drivers in terms of receiving traffic penalties. It means that disabled drivers wanted to emphasize that disabled drivers cannot behave purely positive in traffic environments. Non-disabled drivers have positive driver behaviors in addition to aberrant driver behaviors, similarly disabled ones do the same. That is, in some situations, they also break the rules intentionally or unintentionally.

As another comparison of the two driver groups, independent samples t-test indicated significant results for age. It was found that disabled drivers' age was higher than non-disabled drivers' sample. It may result from the nature of disabled drivers sample in this study. It means that because disabled drivers' driving license education procedure is somehow different and after getting a driving license they need special cars they may start being a part of traffic environments at later ages than non-disabled ones.

The second independent samples t-test analysis indicated significant results for annual kilometer reports of disabled drivers and non-disabled drivers. Contrary to the expectations, disabled drivers reported higher annual kilometer than non-disabled drivers. This may reflect the conclusion that disabled drivers are active drivers of the traffic environments. On the other hand, there were some contradictory factors for the accuracy of self-report of annual kilometers. As Lajunen & Özkan (2011) stated the underlying reason of this result can be explained by the same logic with self-report

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problems of accident involvement. Although sometimes drivers can forget total kilometer they driven, as in the case of forgetting total number of accidents being involved, when we compare these two cases, it is seen that the bias in reporting number of accidents has higher possibility as compared to reporting the total kilometer. Researchers pointed out that it is because annual kilometer is a continuous variable and evaluation of it easier and simpler. Moreover, accidents are prone to be forgotten more than kilometer because sometimes they can be traumatic life events. In the interview sections ADDS, it was observed that either disabled or non-disabled drivers can estimate their annual kilometer because many of them reported that until this question was directed to them, they had not thought about or noted this data. This shows that there can be other techniques, like using the kilometer records kept by the cars, to get knowledge about drivers' annual kilometer rather than just asking the drivers to tell the exact numbers.

3.4.3 Evaluations of the Comparison of Disabled and Non-disabled Drivers on the Main Variables of the Study

3.4.3.1 Evaluation of Comparison of Disabled and Non-disabled Drivers on DBQ Factors

Driver behavior comparisons of disabled drivers and non-disabled drivers based on DBQ-self measure (i.e., each group evaluated their own driver behaviors) and DBQ-other measure (i.e., each group evaluated the other group's driver behaviors) represented significant findings.

First of all, self-measures were compared for disabled and non-disabled drivers and after that other measures were compared for disabled and non-disabled drivers. The only significant results showed that in terms of the comparisons on DBQ-self measures, non-disabled drivers' self-evaluation of positive drivers were higher then the disabled drivers' self-evaluation of positive driver behaviors; although both groups self-evaluations were above average. As Özkan & Lajunen (2011) explained self-reports are affected from social desirability effects. The previous studies reporting this

fact were investigated non-disabled drivers. With this finding, we can say for the first time that the same trend is valid for disabled drivers as well.

As another result, the comparison of these two driver groups showed that when these groups evaluated each other's driver behaviors (i.e., DBQ-other measure) disabled drivers reported higher aggressive violations, ordinary violations and errors for non-disabled drivers as compared to non-disabled drivers' evaluation for them. On the other hand, non-disabled drivers reported more positive driver behaviors for the other driver group. In the literature there has not been an attempt to understand one groups' perception on the other groups in terms of DBQ evaluations. For this reason, in order to talk about the reasons of the differences in other group evaluations of driver behaviors, different groups of drivers should be investigated in the further studies. However, in the interview stage of the scale development and data collection stage of the main study, some disabled drivers stated that they only evaluated male non-disabled drivers; because they have negative life experiences with some of the male non-disabled drivers in traffic. They stated that they only think about those drivers while evaluating the non-disabled driver group. This may affect their evaluation and so they may report more aberrant behaviors for non-disabled drivers than non-disabled drivers' evaluation for them. As another comparison, in terms of positive driver behaviors, the reason of non-disabled drivers' reporting more positive driver behaviors for disabled ones may result from evaluating other attributes of disabled people which were not originated from physical disability. One of the disability studies Coleman, Brunel l& Haugen (2015) proved that non-disabled people found physically disabled women being more competent than intellectually disabled ones. This finding was explained by the fact that importance of emotional expectations from a woman based on need of nurturing and warmth. In this sense, physical attractiveness of her and disability keeps in the background in social life because expectations from her did not need physical features. Likewise, gender and disability association, in traffic, non-disabled drivers may found disabled drivers as competent for driving ability based on their driver role. Furthermore, interviews of non-disabled participants conducted in the process of ADDS development, it was reported that because non-disabled drivers had

never interacted with a disabled driver in traffic environments, they supposed that disabled drivers have more positive and unobtrusive driving habits. On the other hand, the interviewed disabled participants complained about non-disabled drivers' distracting and disrespectful behaviors especially in the parking and special areas reserved for disabled ones. Based on these assumptions, non-disabled drivers' evaluation of disabled drivers represented more positive driver behaviors than disabled drivers' evaluation for them. This can be supported by either non-disabled drivers' lack of knowledge on disabled driving in detail and or finding physical disabilities as not disincentive factors for driving.

Comparison of self-reported driver behaviors of disabled drivers and non-disabled drivers (i.e., their DBQ-self evaluations) and their evaluation of other group's driver behaviors (i.e., DBQ-other evaluations) indicated that disabled drivers evaluated non-disabled drivers as having more aggressive violations, ordinary violations, errors and lapses than themselves. Study-1This finding is consistent with the interview findings of disabled drivers indicating that non-disabled drivers are displaying more negative behaviors and attitudes on the roads. Concerning the findings on comparison of the self-other findings, another result indicated that disabled drivers reported themselves as displaying more positive driver behaviors than non-disabled drivers. This finding was also supported and supports some interview findings of Study-1. For example, disabled drivers mentioned about some examples indicating negative experiences that they had with non-disabled drivers, in addition to the lack of help or assistance from non-disabled drivers in traffic settings.

On the other hand, non-disabled drivers reported more errors and lapses for disabled drivers than themselves. Because error and lapses are unintentional mistakes this expectation may caused from physical disability of disabled drivers. Burke et al. (2013) reported that in working environments there were negative attitudes to hire and retain disabled people because it was thought that disabled people need extra accommodations like suitable working areas and user friendly tools for their disability. Likewise, in working environments to manage job duties, in traffic environments

disabled people need equipped vehicles and road/parking facilities to have fluent driving performance. These needs of disabled drivers may cause non-disabled drivers to expect more errors and lapses from disabled drivers in traffic environments.

The comparison of different type of driver behaviors in disabled drivers' self-reports indicated that disabled drivers reported that they have more positive driver behaviors than aggressive violations, more aggressive violations than ordinary violations and more ordinary violations than errors. They also evaluated non-disabled drivers as having more positive driver behaviors than aggressive violations, more aggressive violations than ordinary violations, more ordinary violations than errors, more errors than lapses. Likewise, disabled drivers, non-disabled drivers' self-reported driver behaviors included more positive driver behaviors than aggressive violations, more aggressive violations than ordinary violations, more ordinary violations than lapses and more lapses than errors. As another remarkable result when non-disabled drivers evaluated driver behaviors of disabled drivers they reported that disabled drivers have more positive driver behaviors than other driver behaviors. Moreover, they have less ordinary violations than other driver behaviors. There were no differences between the evaluation of the other driver behaviors (aggressive violations, errors and lapses) of them. According to this results it could be said that for both group of drivers the highest frequency in self and other evaluations were for positive driver behaviors, and less frequent behaviors were reported as errors and/or lapses. However, there was an exception in the other evaluation of the non-disabled drivers. Their evaluation indicating that disabled drivers' less frequent driver behaviors are ordinary violations show that they perceive the possibility of observing errors and lapses as more frequent than ordinary violations is high for non-disabled drivers. This main study finding is supported by the interview findings in Study-1. In the interviews non-disabled drivers had the tendency of defining disabled drivers as being more sensitive in obeying traffic rules and regulations.

3.4.3.2 Evaluation of Comparison of Disabled and Non-disabled Drivers on DSI factors

The comparison of disabled drivers and non-disabled drivers indicated that when disabled and non-disabled drivers evaluated the other group's driving skills (i.e., DSI-other), while disabled drivers reported stronger perceptual-motor skills for non-disabled drivers than non-disabled ones' evaluation for disabled drivers; non-disabled drivers reported stronger safety skills for disabled drivers. Concerning the self-other evaluation comparisons, while disabled drivers reported more perceptual-motor skills and safety skills for themselves (i.e., their self-evaluation of those skills) as compared to their evaluation of non-disabled ones' perceptual-motor and safety skills; non-disabled drivers reported only stronger perceptual-motor skills in self-evaluations as compared to their other-evaluation of the same skills for disabled drivers. The results also showed that, while disabled drivers reported more perceptual-motor skills for non-disabled drivers, non-disabled drivers reported more safety skills than perceptual-motor ones for disabled driver groups. It may be deduced that while non-disabled drivers see disabled drivers somehow safe drivers, disabled drivers have more positive attitudes towards driving skills of their own groups. In a regional research done by employer participants who hire disabled people in suitable job positions it was reported that disabled people were evaluated as having adequate performance, practiced safety habits, sufficient supervision background and professional ethics (e.g. punctuality or dressing appropriately; Able Trust, 2003). Consistent with these findings representing positive life experiences of employers, it can be concluded that like the working environments in traffic environments disabled people may also be perceived as safe people.

3.4.3.3 Evaluation of Comparison of Disabled and Non-disabled Drivers on ADDS Factors

Disabled and non-disabled drivers had different attitudes towards disabled drivers in traffic environments. Results of the current study indicated that disabled drivers have more positive attitudes towards their groups' adaptation to general traffic

environments, social competence and technical competence in traffic environments. However, in terms of the rights of disabled drivers in traffic environments attitudes of disabled and non-disabled drivers were not differentiated from each other. Bjorvatn & Tungodden (2015) reported that there was a marginalization of disabled people in society. However, it was indicated that further investigations were needed to decide whether this marginalization is caused by physical barriers and challenges caused by disabled people's missing technological innovations or psychological barriers caused by stereotypes and stigmas affecting social identification of disabled people in society. Consistent with these explanations, it can be said that in traffic environments there could be psychological barriers for disabled drivers. That is, although the rights of disabled people in traffic environments were acknowledged by non-disabled drivers, they could create marginal terms for disabled drivers in terms of adaptive, social and technical abilities of them in traffic environments. As disabled drivers have more positive attitudes towards their own driver groups' adaptive, social and technical competence in traffic, it can be said that in traffic the reason of marginalization of disabled drivers is not physical barriers of them. The effects of psychological barriers in this setting need further investigation.

3.4.4 Discussion of Hierarchical Regression Analyses for the Disabled Drivers

In all hierarchical regression analyses, age, sex and annual kilometer variables were controlled so as to avoid possible confounding effects of them. It is because in the literature, age, sex and annual kilometer was reported as the variables being related to human factors in driving.

3.4.4.1 Evaluation of the Relationships between ADDS Factors and DBQ-self Scores of Disabled Drivers

For disabled drivers, a set of analyses were performed to see which factors of ADDS will be related to disabled drivers' self-evaluation of driver behaviors. First of all, results of the current study indicated that there were negative relationships between ADAPT factor of ADDS and aggressive violations, ordinary violations, errors and

lapses factors of DBQ. On the other hand, there was a positive relationship between ADAPT factor of ADDS and positive driver behaviors. These results can be explained by that disabled drivers may feel uncomfortable and exhibit more violations in traffic settings because their thought of not adapting to general traffic environments. The feelings of lack of comfort in traffic settings may lead them to do dangerous actions and take risks. Furthermore, for errors and lapses, because they believe that ADAPT is inadequate, in traffic they may be influenced other drivers' behaviors easily and make mistakes when trying to do right things. This finding was also supported by the results of Study-I. For example, the disabled drivers indicated in the interviews that some attitudes and behaviors of the other road users towards disabled people, make them more error prone in traffic. The results showed that if disabled drivers believe that they adapted to general traffic environments, they reported more positive driver behaviors. It may be because of the feeling of being a part of traffic environments and the need for being perceived as a part of traffic environment.

In addition, there was a positive relationship between T-COMP factor of the ADDS and aggressive violations. This may be resulted from their high self-confidence in traffic settings. This self-confidence makes them evaluate the perceived benefits of violations outweigh the perceived penalties, so they also evaluated their technical competence stronger in traffic and reported more aggressive violations.

3.4.4.2 Evaluation of Relationships between ADDS Subscales and DSI-self Scores of Disabled Drivers

According to results, both perceptual-motor skills and safety skills were found as positively related to disabled drivers' attitudes towards their own group's social competence in traffic environments. This result is predictable for the study because social competence in traffic environments refers to having socially interactive skills and behaviors like being helpful, supportive and respectful to other road users or being compatible for traffic rules and regulations. These skills involve both perceptual-motor skills and safety skills of disabled drivers, so the positive relation between self-

reported DSI factors and attitudes towards social competence of the own group was one of the expected results.

3.4.5 Discussion of Hierarchical Regression Analysis for the Non-disabled Drivers

3.4.5.1 Evaluation of Relationships between ADDS Subscales and DBQ-other Scores of Non-disabled Drivers

Study results showed that there were negative correlations between ADAPT and S-COMP factors of ADDS and aggressive violations, ordinary violations, errors and lapses factors of DBQ. It can be interpreted as if non-disabled drivers believe that disabled drivers manage to be a part of general traffic environments and have strong social skills in there. While adapting to the traffic environments enables disabled drivers to find the task as very familiar and the task requires little thought without confusion, having strong social competence may increase their respectful and compatible behaviors by decreasing intended violations and unintended errors/lapses in traffic.

For positive driver behaviors factor of DBQ, results showed that if non-disabled drivers have strong attitudes in ADAPT, RIGHTS, S-COMP factors of ADDS, they reported more positive driver behaviors for them. It may represent the notion that if a disabled driver is perceived as adapting to traffic environments, reflecting high social competence for other driver group and lastly having grant of rights in traffic, this compatible framework of attitude may cause a non-disabled driver to evaluate disabled drivers as having more positive driver behaviors.

3.4.5.2 Evaluation of Relationships between ADDS Subscales and DSI-other Scores of Non-disabled Drivers

Results showed that ADAPT and S-COMP factors of ADDS were positively related to non-disabled drivers' other-evaluation of both perceptual-motor skills and safety skills. Non-disabled drivers may believe that if a disabled driver have sufficient perceptual-motor skills and safety skills, s/he easily adapt to traffic environments.

Moreover, because this environment needs socially interactive elements and adaptation is important for this competence, if there are high perceptual-motor skills and safety skills for disabled drivers, there were no difference between disabled and non-disabled ones in terms of being a part of the same environment.

In similar ways, evaluated perceptual-motor skills of disabled drivers were positively related to attitudes towards technical competence of disabled drivers in traffic. On the other hand, it was found that RIGHTS factor of ADDS was negatively related to other-evaluation for perceptual-motor skills of disabled drivers. The interpretation of this result and the comparison of the two driver groups can be evaluated as one of the essential findings of current study. Comparison of self-other driving skills evaluations of disabled and non-disabled drivers had shown that non-disabled drivers reported more safety skills for disabled drivers than perceptual-motor skills. Moreover, the comparison of disabled and non-disabled drivers in terms of ADDS factors had shown that there were not statistically significant differences between attitudes of these two groups towards rights of disabled drivers in traffic environments. These rights included disability regulations and some privileges for disabled drivers so as to facilitate their driving activity in traffic environments. By combining these results, it can be concluded that non-disabled drivers evaluate perceptual-motor skills of disabled drivers less, so their attitudes towards their rights in traffic settings is as high as disabled drivers' attitudes. If non-disabled drivers evaluated disabled drivers as having more perceptual-motor skills, they may want to have equal rights with them in traffic environments and have more negative attitudes towards additional rights and regulations for disabled drivers. Similarly, if they evaluated disabled drivers as having more perceptual-motor skills which needs cognitive skills, they expect them to have stronger technical skills like fluently driving a car, being professional driver or swiftly responding to an unexpected incident in traffic.

CHAPTER IV:

GENERAL CONCLUSION:
STUDY 1 AND MAIN STUDY EVAULATION

4.1 Implications of the Study

In the literature, studies aimed to understand disability and disabled people by concentrating on behaviors of disabled people on different environments and defining possible factors related to these behaviors. Moreover, intervention programs for essential settings of social life may create respectable amount of improvements in disabled people's life. However, these studies didn't involve every parts of social life settings. One of these settings is traffic environments. As disabled drivers have not been investigated previously in the literature, firstly it was important to develop a measure which could make it possible to get detailed on-the road information about this group of drivers. For this purpose, interviews focusing on attitudes towards disabled drivers were conducted with both disabled and non-disabled drivers in the first part of this study (Study-1). The information gathered from these interviews was used to develop the 'Attitudes towards Disabled Drivers Scale - ADDS)'. In the main study part, by using ADDS attitudes towards disabled drivers data was gathered in addition to the human factors data collected via previously developed and frequently used instruments (i.e., DBQ and DSI) but from a different perspective. That is, in the present study each group of drivers (disabled and non-disabled drivers) evaluated their own driver behaviors (DBQ-self) and driving skills (DSI-self) and the other groups driver behaviors (DBQ-other) and driving skills (DSI-other). This way of evaluation was planned as it could make it possible to get information about the self-evaluation and other-evaluation on the human factors in driving at the same time. By this way, it became possible to make comparisons between different groups of drivers and their evaluations of other groups. The current study provided a significant contribution to the literature by combining Study-1 and main study results. That is, for the first time

in the literature, qualitative and quantitative results of the investigations on human factors in disabled driving combined and evaluated together. The findings of the study-1 which was analyzed with qualitative methods enabled to understand disabled driving in detail by providing knowledge about disabled drivers' group characteristics, their attitudes towards traffic environments, their experiences and non-disabled drivers' perspectives about them. Furthermore, according to feedback received from non-disabled drivers who participated the study-1, the interview sessions raised their awareness about disability. This may improve their awareness also in traffic settings and disabled driving may gain more concern from other road users. In the main study, the quantitative data was used to investigate the descriptive and explanatory comparisons between variables and groups of drivers. Using results of both qualitative analysis (Study-1) and quantitative analysis (Main study) enriched the interpretation of main study results which were included human factors of disabled drivers and attitudes towards disabled driving.

Lastly, this study enabled non-disabled drivers to think about and be aware of the disabled drivers in traffic settings. During interview sections of ADDS measure development, all of the non-disabled participants reported that this was the first time for them to think about disabled drivers in traffic settings. Furthermore, any of the non-disabled drivers could guess the exact number of disabled drivers in traffic environments. While some of them didn't give answer the question of number of active disabled drivers in traffic, other respondents of the question did not think about huge numbers of disabled drivers. There were even some drivers thinking that there were around a hundred disabled drivers in the city that s/he was living (Ankara). Likewise, in interview sections, during main study process many of non-disabled drivers didn't participate to the study because they mentioned that they were unaware of disabled drivers' active participation of traffic environments.

4.2 Critical Remarks and Concerns for the Future Studies

First of all, there are some critical issues to discuss about the data collection process of the present study. To reach disabled drivers wheel chair basketball teams in some

metropolitans of Turkey (İstanbul, Ankara, İzmir and Samsun) were connected. Approximately half of the disabled participants of the current study were players of these teams. This caused the sample to be composed of mostly male disabled drivers. Moreover, because many wheel chair basketball players started playing at elder ages, age of the disabled drivers were higher than non-disabled samples. During conversations about the aim and procedure of the study it was observed that disabled drivers being interested in playing basketball reported more competence in social life adaptation and management skills. Furthermore, they had more positive attitudes towards traffic environments and their presence in these settings. For this reason, characteristics of this sample might affect the study results.

Additionally, there were some limitations originated from nature of the samples. First of all, disabled drivers were selected from some metropolitans of the Turkey. Because in metropolitans there were more regulations and awareness about disability, other small cities and their disabled citizens need to be investigated. Likewise, disabled drivers, half of non-disabled drivers sample were selected from METU (Middle East Technical University). This might affect the sample characteristics because METU is an active university in terms of developing disabled awareness in society and providing facilities for its disabled members. Furthermore, while evaluating the other groups' human factors with the questionnaires DBQ-other and DSI-other, disabled drivers and non-disabled drivers thought about specific type of people especially they were faced with in traffic. For example, disabled drivers reported that they always evaluate male non-disabled drivers when they were asked about the other group's driver behaviors and driving skills. High number of male drivers and higher violations of them in traffic environments might affect the attitudes of disabled drivers. As for non-disabled drivers, they also reported that when they were asked about disabled drivers' driver behaviors and driving skills, they could not imagine the type of disability. This was caused by the lack of knowledge about disability types and regulations of disabled driving. In future studies, to inform the other group members using qualitative analysis method like semi-structured interviews can help provide more information about group characteristics and clarify information gaps during conversation.

Self-report technique has many advantages in terms of price, being informative compared to observation techniques, accessibility of participants and user friendly statistical methods (Lajunen & Özkan, 2011). For example, DBQ as a self-report instrument can give idea about driver behaviors in traffic as well as psychological background of observed driver behaviors like attitudes and motives (Roman, Poulter, Barker, McKenna & Rowe, 2015; Lajunen et al., 2004). In spite of these advantages there are weaknesses about self-reports. For example, the ratings of these kinds of measurement tools can take shape according to experiences, characteristics and perception of drivers. For example, a driver who states that s/he exceeds the speed limit might have an impression like that this behavior is an unserious offence. However, as the same driver becomes more experienced, it is also possible for him/her to perceive that behavior as a serious offence and observe her/his speeding more consciously. For this reason, her/his reporting might include more frequent speeding behaviors after being experienced (Warner et al., 2011). As another problem, self-reports might create socially desirable responses. Although Lajunen & Summala (2003) claimed that social desirability is not a concern when looking at reliability of drivers' reporting of their behaviors and Sullman & Taylor (2010) confirmed this notion, Lajunen & Summala (2003) also pointed out the necessity of paying attention to collecting process of self-reports. To have reliable ratings, they emphasized the importance of collecting data anonymously without singled-out the participants, encouraging honesty in responses and adding lie scales to check social desirability effects on responses. As another problem self-report technique is exposed to automated processes and drivers can underestimate these habits while reporting (Lajunen & Özkan, 2011).

4.3 Concluding Remarks

It is known that disability studies can provide awareness to society in terms of unique and special abilities of disabled people. Moreover, as it has been mentioned previously, to have appropriate disability policies in society and decide framing of these policies ('disability and the related policy' or 'the policy in general'), it is important to

understand disability and the interaction between social structures and disability. As the suggested way for empowerment of disabled people, this study may provide opportunity to be aware of the existence of disabled drivers and the human factors in disabled driving in traffic settings. This knowledge can improve reconstruction and development attempts in traffic regulations. Lastly, in terms of theoretical contributions, this study provided literature with a newly developed attitude scale for disabled drivers. By using this scale in the future studies in relation to different individual, environmental and cultural variables, it could be possible to get more detailed understanding of disabled drivers from both disabled and non-disabled drivers' perspective.

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APPENDICES

Appendix A: Ethical Permission for Interviews

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

Sayı: 28620816/ 128 – 344

10.03.2015

Gönderilen : Y. Doç. Dr. Bahar Öz
Psikoloji

Gönderen : Prof. Dr. Canan Sümer
IAK Başkan Vekili

İlgi : Etik Onayı

Danışmanlığını yapmış olduğunuz Psikoloji Bölümü öğrencisi Anıl Bakır'ın "Investigation and Comparison of Human Factors in Driving and Attitudes towards Disabled Drivers: A Study with Disabled and Non-Disabled Drivers" isimli araştırması "İnsan Araştırmaları Komitesi'' tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

10/03/2015

Prof.Dr. Canan Sümer
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkan Vekili
ODTÜ 06531 ANKARA

17.05.2015   10

Appendix B: Demographic Information Form for Interviews

DEMOGRAFİK BİLGİ FORMU

1. Yaşınız:

2. Cinsiyetiniz: Kadın Erkek

3. Eğitim durumunuz: _____

4. Ne kadar süredir ehliyet sahibisiniz? _____ Yıl

5. Ehliyet türü _____

6. Fiziksel engeliniz var mı? Evet_____   Hayır   Varsa belirtiniz? _____ _____

_____

7. Geçen yıl yaklaşık olarak toplam kaç km araç kullandınız? _____ Kilometre (km)

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

9. Lütfen son üç yıl içerisinde toplam kaç trafik cezası aldığınızı belirtiniz _____

Mülakat Soruları

1-Engelli sürücülerin ehliyet alma ve ehliyet kursu süreciyle ilgili neler söyleyebilirsiniz?

2-Ehliyet için sağlık raporu alma sürecini kısaca anlatır mısınız?

3-Sizce yaşadığınız şehirde trafikte aktif olarak araç kullanan kaç engelli sürücü bulunmaktadır?

4- Sizce engelli sürücüler araç kullanırken ne tür sorunlarla karşılaşırlar? Siz bu sorunların hangileriyle karşılaştınız?

5- Trafikte engelli sürücülerin diğer engelli sürücülere yönelik duygu, düşünce ve davranışları konusundaki görüşleriniz nelerdir?

6-Trafik ortamında engelli bir sürücüyle yaşadığınız veya şahit olduğunuz negatif bir durumu anlatabilir misiniz?

7-Trafik ortamında engelli bir sürücüyle yaşadığınız veya şahit olduğunuz pozitif bir durumu anlatabilir misiniz?

8-Trafikte engelsiz sürücülerin engelli sürücülere yönelik duygu, düşünce ve davranışları konusundaki görüşleriniz nelerdir?

9-Trafik ortamında engelsiz bir sürücüyle engelli bir sürücü arasında yaşandığına şahit olduğunuz negatif bir durum oldu mu? Olduysa bu durumu anlatabilir misiniz?

10- Trafik ortamında engelsiz bir sürücüyle engelli bir sürücü arasında yaşandığına şahit olduğunuz pozitif bir durumu oldu mu? Olduysa bu durumu anlatabilir misiniz?

11-Sizce engelli ve engelsiz sürücüler arasında sırasıyla trafikle ilgili bilgileri, kurallara uymaları ve araç kullanma becerileri konusunda farklar var mıdır? Varsa ne gibi farklardan bahsedebilirsiniz?

12-Sizce engelli ve engelsiz sürücüler arasında trafik ortamını, düzenini ve diğer yol kullanıcılarını koruyucu ve kolaycı olmak açısından farklar var mıdır? Varsa ne gibi farklardan bahsedebilirsiniz?

13-Sizce engelli sürücüler trafikte özel yasal haklara sahip olmalı mı? Evet, ise neden ve ne gibi haklara sahip olmalılar?

14-Sizce engelli sürücüler için daha rahat ve güvenli bir trafik ortamı nasıl oluşturulabilir? Bu konuda neler yapılmalıdır?

Engelli Sürücülere Yönelik Tutum Anketi Taslağı

Anket Boyutları:

Lütfen aşağıdaki tabloda sunulan her bir maddenin yine tabloda verilen boyutlardan hangisine ait olduğunu ilgili hücreye tik atarak belirtiniz. Değerlendirmelerinizi yaparken tabloda belirtilen boyutların şu içeriklerini dikkate alınız:

Trafik Ortamında Yeterlilik: Engelli sürücülerin araç kullanırken ve trafik ortamlarıyla baş ederken sahip olunması gereken teknik becerilere (araç kullanma ve yol hâkimiyeti ile ilgili beceriler) ne oranda sahip olduğuyla ilgilidir.

Sosyal Etkileşim ve Beceriler: Engelli sürücülerin trafik ortamında engelli olan veya olmayan diğer yol kullanıcıları ile ne şekilde etkileşim içinde olduğuyla, iletişime geçerken kullanmaları gereken sosyal becerileri ne ölçüde/şekilde kullandıklarıyla ilgilidir.

Engelli Sürücülere Yönelik Empati: Engelli sürücülerin trafik ortamında içinde bulunduğu duruma onun bakış açısından bakabilmeyle, duygu ve düşüncelerini anlayabilmeyle, davranış ve tepkilerinin altındaki niyeti anlama eğilimiyle ilgilidir.

Trafikte Sürücü Hakları: Engelli sürücülerin birer sürücü olarak ne tür haklara sahip olduğuna ve veya olması gerektiğine yönelik tutumla ilgilidir.

Tutumu oluşturan öğeler: Size sunulan tabloda yer alan maddeleri yukarıdaki boyutlardan birine yerleştirmenizin yanında, tutumu oluşturan öğelerden hangisine ait olduğunu düşündüğünüzü de belirtmeniz istenmektedir. Lütfen maddenin Bilişsel öğeye ait olduğunu düşünüyorsanız ilgili hücreye "**B**", Davranışsal öğeye ait olduğunu düşünüyorsanız "**Da**", Duygusal öğeye ait olduğunu düşünüyorsanız "**Du**" yazınız.

Anketten çıkarılması gerektiğini düşündüğünüz bir madde varsa lütfen o maddenin yanındaki ilgili kutucuğa tik atınız. Bu maddelerin neden çıkarılması gerektiğini

düşündüğünüzü anketin en sonundaki "Başka Görüş ve Önerileriniz" kısmına yazabilirseniz çok sevinirim.

	BOYUTLAR					
MADDELER	Trafik Ortamında Yeterlilik	Sosyal Etkileşim ve Beceriler	Engelli Sürücülere Yönelik Empati Eğilimi	Trafikte Sürücü Haklarına	Bilişsel (B), Davranışsal (Da), Duygusal (Du)	Bu madde anketten çıkarılmalı
1. Engelli sürücülerin kendilerine özel alanlarda araba kullanması gerekir.						
2. Engelli sürücüleri korumak devletin görevidir.						
3. Engelli sürücüler trafik becerileri açısından engelsiz sürücülerden farklı değildir.						
4. Engelli sürücüler trafik ortamlarında engelsiz sürücülere kıyasla daha kolay sinirlenmektedir.						
5. Engelli sürücüler trafikte karşılaştıkları sorunları çözme konusunda yetersizdir.						
6. Engelli bir sürücünün trafikte olduğunu fark ettiğimde hem kendim, hem o sürücü hem de diğer yol kullanıcılarının güvenliği için daha dikkatli davranırım.						
7. Engelli sürücüler trafikte kendilerini korumasız hissederler.						
8. Engelli bir sürücü olsaydım ne hissederdim diye düşünmüşümdür.						
9. Engelli sürücüleri görünce nasıl davranacağımı ve ne düşüneceğimi bilemediğimden trafikte onlara karşı davranışlarım konusunda kararsızlık yaşarım.						
10. Engelli sürücülerin trafik ortamlarında engelleriyle başa çıkma gücünü takdir ederim.						
11. Engelli bir sürücü görünce kendimi onun davranışlarını, duygu ve düşüncelerini anlamaya çalışırken bulurum.						
12. Engellilerin trafikte yaşadığı sorunlar tüm toplumun problemidir.						

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13. Türkiye'de trafik ortamlarında engelli sürücülerin hareket alanı ve imkânları kısıtlıdır.					
14. Engelli sürücülerle aynı ortamda araç kullanırken kendimi güvende hissetmiyorum.					
15. Trafikte araç kullanırken yakınlarımda engelli bir sürücü fark edersem daha temkinli olmam gerektiğini düşünürüm.					
16. Trafikte engelli sürücü plakalı bir araca yakın araç kullanmayı güvenli bulmuyorum.					
17. Engelli sürücülerin trafiğe çıkmaması bence daha iyi olurdu.					
18. Aracımı park ederken engelli sürücü plakası gördüğüm araçların yanına park etmeyi güvenli bulmuyorum.					
19. Engelli sürücülerle aynı ortamda araç kullanırken trafikte bir şekilde zarar göreceğimiş gibi geliyor.					
20. Genel trafik düzenlemeleri engelli sürücülere göre değil de engeli olmayanlara göre yapılmalıdır.					
21. Engelli bireylerin de sürücü belgesi alması doğru bir uygulamadır.					
22. Engelli sürücüler engelsiz sürücülere karşı duyarlı davranır.					
23. Engellerinden dolayı engelli sürücülerden araç kullanma yetkinliği konusunda belli bir noktaya kadar beklenti içinde olabiliriz.					
24. Trafik ortamlarında engelli ve engelsiz sürücülerle aynı sıcaklıkta iletişim kurulabilir.					
25. Engelli sürücüler trafik ortamlarında engelsiz sürücülerin baş edebileceği her türlü zor durumla baş edebiliriler.					
26. Engelli sürücülerin pek çok özelliği var olan engellerini trafik ortamlarında telafi edebilir.					
27. Trafik ortamlarında gerektiğinde kendimi engelli sürücülerin yerine koyar ve ona göre hareket ederim.					
28. Engelli bir sürücü trafik ortamının güvenli ulaşım amacına olumsuz etki eder.					
29. Engelli insanlardan araç kullanmasını beklemek onlardan yapabileceklerinden fazlasını istemek olur.					
30. Engelli bir sürücünün sürücülük becerileri konusunda kendini geliştirebileceğine inanmıyorum.					
31. Engelli sürücülerin bulunduğu trafik ortamında huzursuzluk yaşanması olasılığı sadece engelsiz sürücülerin bulunduğu ortamlara kıyasla daha yüksektir.					

32. Araç kullanmak için yasal bir hakları olmasaydı engelli sürücülerin trafiğe çıkmasını engellemek isterdim.						
33. Engelli sürücülerin trafik kazalarına neden olma olasılığı daha yüksektir.						
34. Engelli sürücüler engelsiz sürücülerden daha düşük araç sürme becerisine sahiptir.						
35. Trafik ortamlarında daha fazla sayıda engelli sürücünün araç kullanabilmesine yönelik düzenlemeler yapılmalıdır.						
36. Engelli sürücüler de profesyonel sürücü olarak (örn. Otobüs şoförü, taksi şoförü) çalışabilmelidir.						
37. Engelli sürücüler engelsiz sürücülere kıyasla diğer yol kullanıcılarıyla iletişimlerinde daha kompleksli davranırlar.						
38. Ülkemizde engelli sürücülerin de trafik ortamından engelsiz sürücüler kadar faydalanabilmesi yönünde düzenlemeler yapılması için gerekli tüm kaynaklar kullanılmalıdır.						
39. Trafik ortamlarında engelli sürücülerin bulunmasının bu ortamlardaki uyumu bozduğunu düşünüyorum.						
40. Engelli sürücüler araç kullanırken engelsiz sürücülere oranla daha fazla hata yaparlar.						
41. Engelli sürücüler engelsiz sürücülere kıyasla daha fazla trafik ihlali yaparlar.						
42. Trafik ortamlarında uyum içinde olmak için insanlara engelli hakları konusunda eğitim verilmelidir.						
43. Engelli sürücüler de engelsiz sürücüler kadar iyi araç kullanır.						
44. Engelli sürücüler trafik ortamlarında engelsiz sürücülere kıyasla daha fazla yardımcı, destekleyici ve sosyal trafik ortamını rahatlatıcı davranışta bulunurlar.						
45. Engelsiz sürücüler trafikteki performansları açısından engelli sürücülerle eş tutulmaktan hoşlanmaz.						
46. Engelli sürücüler trafik ortamlarında engelsiz sürücülerden daha az saldırgan davranış sergiler.						
47. Birçok engelli sürücü trafikte özel muamele beklemektedir.						
48. Engelli sürücüler engelsiz sürücülerle aynı sürüş performansına sahip olmayı beklememelidir.						
49. Engelli sürücüler trafikte daha çok diğer engelli sürücülerle etkileşim içinde olmak ister.						
50. Engelli bir sürücü olmanın trafik ortamlarında ne tür sorunlar yaratabileceğinin farkındayım.						

51. Engelli sürücü adayına uygulanan sürücü belgesi sınavı diğer adaylara uygulanandan daha zor olmalıdır.						
52. Engelli sürücüler trafikte öncelik sahibi olma konusunda çok fazla ilgi beklentisi içerisindedir.						
53. Engelli sürücüler trafik performansları konusunda çok fazla övgü beklentisi içerisindedir.						
54. Engelli sürücülerin diğer yol kullanıcılarına yönelik davranış şekilleri rahatsız edicidir.						
55. Engelli sürücülerin ehliyet alma sürecinde motor bilgisinden muaf tutulması doğru bir uygulamadır.						
56. Engelli sürücülerin trafik ortamlarında hata yapmasında ve riskli davranışlar sergilemesinde engelsiz sürücülerin onlara karşı olan negatif tavır ve davranışlarının etkisi vardır.						
57. Engelli sürücüler trafik ortamlarında engelsiz sürücülere göre daha saygılı davranırlar.						
58. Engelli sürücüler engelsiz sürücülere göre daha yardımseverlerdir.						
59. Engelli sürücüler her ne kadar engellerine göre düzenlenmiş araç kullansalar da, trafik ortamına engelsiz sürücüler kadar hakim olamazlar.						
60. Engelli sürücüler engelsiz sürücülere göre trafik kurallarına daha fazla uyarlar.						
61. Otoparklardaki engelli park alanları konum, kullanım ve ulaşım kolaylığı açısından engelli sürücülere uygun planlanmıştır.						
62. Engelli sürücüler için ayrılmış park yerlerinin sayısı yeterlidir.						
63. Sürücü kurslarında engelli sürücülerin direksiyon eğitimi için kullanılabilecek donanıma sahip araçlar bulunmaktadır.						
64. Ehliyet sınavları engelli sürücülerin engellerine uygun bir şekilde yapılmalıdır.						
65. Engelli sürücülerin arıza ve kaza gibi durumlarda yardım isteyebileceği özel hatlar olmalıdır.						

- Yukarıda belirtilen boyutlar dışında ankete eklenmesi gerektiğini düşündüğünüz bir boyut varsa lütfen adını/içeriğini belirtiniz:

  Lütfen bu boyuta eklemek istediğiniz madde(ler) varsa belirtiniz:

- Tabloda hâlihazırda sunulan boyutlar için eklemek istediğiniz ek madde(ler) varsa lütfen buraya boyut ismini ve eklemek istediğiniz maddeyi yazınız:

- Verilen boyutlardan birine yerleştirdiğiniz halde üzerinde değişiklik yapılması gerektiğini düşündüğünüz maddeler var mı? Varsa lütfen madde numarasını ve önerdiğiniz değişikliği belirtiniz:

- Başka Görüş ve Önerileriniz:

Yardım ve katkılarınız için çok teşekkür ederiz

Appendix E: Ethical Permission for the Main Study

Sayı: 28620816/341

29 Temmuz 2015

Gönderilen : Yrd.Doç.Dr. Bahar Öz
               Psikoloji Bölümü

Gönderen : Prof. Dr. Canan Sümer
            IAK Başkan Vekili

İlgi   : Etik Onayı

Danışmanlığını yapmış olduğunuz Psikoloji Bölümü öğrencisi Besime Anıl Bakır'ın "**Investigation and Comparison of Human Factors in Driving and Attitudes towards Disabled Drivers: A study with Disabled and Non-Disabled Drivers**" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

29/07/2015

Prof. Dr. Canan Sümer
IAK Başkan Vekili
ODTÜ 06800 ANKARA

Appendix F: Informed Consent Form for Participants of the Main Study

Bilgilendirilmiş Onam Formu

Sayın Katılımcı,

Orta Doğu Teknik Üniversitesi Fen-Edebiyat Fakültesi Psikoloji Bölümü Trafik ve Ulaşım Psikolojisi Yüksek Lisans Programı öğrencisi B.Anıl BAKIR'ın, Yrd. Doç. Dr. Bahar ÖZ danışmanlığında yürütülen yüksek lisans tez çalışması kapsamında trafikte engelli sürücülere yönelik tutum, engelli ve engelsiz sürücülerin sürücü davranışları ve becerilerini incelemeye yönelik bir araştırma yürütülmektedir.

Anket, genel olarak kişisel rahatsızlık verecek soruları içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz anketi yarıda bırakmakta serbestsiniz. Böyle bir durumda anket uygulayan kişiye, anketi tamamlamak istemediğinizi söylemeniz yeterli olacaktır. Anket uygulamasının sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz.

Çalışmanın içeriği veya sonuçları hakkında bilgi almak isterseniz lütfen bizimle iletişime geçiniz.

B.Anıl BAKIR
Ufuk Üniversitesi Fen-Edebiyat Fakültesi Üniversitesi
Psikoloji Bölümü Araştırma Görevlisi
e-mail: b.anil.kabal@gmail.com
ozbahar@metu.edu.tr

Yrd.Doç.Dr Bahar ÖZ
Orta   Doğu   Teknik
Psikoloji Bölümü
e-mail:

Katılımcı Beyanı:

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip çıkabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayımlarda kullanılmasını kabul ediyorum*. (Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

İsim Soyad   Tarih

İmza

Appendix G: Demographic Information Form

1-Yaşınız:
2- Cinsiyetiniz: (….) Kadın (….) Erkek
3- Eğitim durumunuz: İlköğretim (....) Lise (....) Yüksekokul (....) Üniversite (....) Lisans Üstü (....)   Diğer (Lütfen Belirtiniz) …………………………….
4- Ne kadar süredir ehliyet sahibisiniz? ___ …………….Yıl
5- Ehliyet türü …………………………
6- Fiziksel engeliniz var mı? Evet………   Hayır ………….   Varsa belirtiniz? …………………
7- **Son 1 yıl** içinde yaklaşık olarak toplam kaç km araç kullandınız? ……………… Kilometre (km)
8- Genel olarak, ne sıklıkta araç kullanırsınız? **a.** Hemen hemen her gün **b.** Haftada 3-4 gün **c.** Haftada 1-2 gün **d.** Ayda birkaç kez **e.** Çok nadir
9- **Son üç yılda** kaç kez araç kullanırken **aktif olarak** (sizin bir araca, bir yayaya veya herhangi bir nesneye çarptığınız durumlar) kaza yaptınız? (hafif kazalar dahil) ……………………………….... kez 10- **Son üç yılda** kaç kez araç kullanırken **pasif olarak** (bir aracın ya da bir yayanın size
çarptığı   durumlar)   kaza   geçirdiniz?   (hafif   kazalar   dahil) ……………………………………………………. Kez
11- Lütfen, **son üç yılda** aşağıdaki trafik cezalarını kaç kere aldığınızı belirtiniz.   Yanlış park etme………. Hatalı solama……….   Hız ihlali………. Diğer (Lütfen belirtiniz):..........

Aşağıda verilen her bir madde için sizden istenen bu tür şeylerin **SİZİN BAŞINIZA** NE SIKLIKLA geldiğini belirtmenizdir. Maddeleri nasıl araç kullandığınızı düşünerek cevaplandırınız.

Lütfen değerlendirmelerinizi sizin için en doğru olan seçeneği daire içine alarak belirtiniz.

1= Hiçbir zaman	2= Nadiren	3= Bazen	4= Oldukça Sık	5= Sık Sık	6= Her Zaman

1	Geri geri giderken önceden farketmediğiniz bir şeye çarpmak	1	2	3	4	5	6
2	A yönüne gitmek amacıyla yola çıkmışken kendinizi daha alışkın olduğunuz B yönüne doğru araç kullanırken bulmak	1	2	3	4	5	6
3	Yasal alkol sınırlarının üzerinde alkollü olduğunuzdan şüphelenseniz de araç kullanmak	1	2	3	4	5	6
4	Dönel kavşakta dönüş istikametinize uygun olmayan şeridi kullanmak	1	2	3	4	5	6
5	Anayoldan sola dönmek için kuyrukta beklerken, anayol trafiğine dikkat etmekten neredeyse öndeki araca çarpacak duruma gelmek	1	2	3	4	5	6
6	Anayoldan bir sokağa dönerken karşıdan karşıya geçen yayaları fark edememek	1	2	3	4	5	6
7	Başka bir sürücüye kızgınlığınızı belirtmek için korna çalmak	1	2	3	4	5	6
8	Bir aracı sollarken ya da şerit değiştirirken dikiz aynasından yolu control etmemek	1	2	3	4	5	6
9	Kaygan bir yolda ani fren veya patinaj yapmak	1	2	3	4	5	6
10	Kavşağa çok hızlı girip geçiş hakkı olan aracı durmak zorunda bırakmak	1	2	3	4	5	6
11	Şehir içi yollarda hız sınırını aşmak	1	2	3	4	5	6
12	Sinyali kullanmayı niyet ederken silecekleri çalıştırmak	1	2	3	4	5	6
13	Sağa dönerken yanınızdan geçen bir bisiklet ya da araca neredeyse çarpmak	1	2	3	4	5	6
14	'Yol ver' işaretini kaçırıp, geçiş hakkı olan araçlarla çarpışacak duruma gelmek	1	2	3	4	5	6
15	Trafik ışıklarında üçüncü vitesle kalkış yapmaya çalışmak	1	2	3	4	5	6
16	Sola dönüş sinyali veren bir aracın sinyalini fark etmeyip onu sollamayan çalışmak	1	2	3	4	5	6
17	Trafikte sinirlendiğiniz bir sürücüyü takip edip ona haddini bildirmeye çalışmak	1	2	3	4	5	6
18	Otoyolda ileride kapanacak bir şeritte son ana kadar ilerlemek	1	2	3	4	5	6
19	Aracınızı park alanında nereye bıraktığınızı unutmak	1	2	3	4	5	6
20	Solda yavaş giden bir aracın sağından geçmek	1	2	3	4	5	6
21	Trafik ışığında en hızlı hareket eden araç olmak için yandaki araçlarla yarışmak	1	2	3	4	5	6

22	Trafik işaretlerini yanlış anlamak ve kavşakta yanlış yöne dönmek	1	2	3	4	5	6
23	Acil bir durumda duramayacak kadar, öndeki aracı yakın takip etmek	1	2	3	4	5	6
24	Trafik ışıkları sizin yönünüze kırmızıya döndüğü halde kavşaktan geçmek	1	2	3	4	5	6
25	Bazı tip sürücülere kızgın olmak (illet olmak) ve bu kızgınlığı bir şekilde onlara göstermek	1	2	3	4	5	6
26	Seyahat etmekte olduğunuz yolu tam olarak hatırlamadığınızı fark etmek	1	2	3	4	5	6
27	Sollama yaparken karşıdan gelen aracın hızını olduğundan yavaş tahmin etmek	1	2	3	4	5	6
28	Otobanda hız limitlerini dikkate almamak	1	2	3	4	5	6
29	Karşıdan gelen araç sürücüsünün görüş mesafesini koruyabilmesi için uzunları mümkün olduğunca az kullanmak	1	2	3	4	5	6
30	Gereksiz yere gürültü yapmamak için kornayı kullanmaktan kaçınmak	1	2	3	4	5	6
31	Otobanda trafik akışını sağlayabilmek için en sol şeridi gereksiz yere kullanmaktan kaçınmak	1	2	3	4	5	6
32	Önünüzdeki aracın sürücüsünü, onu rahatsız etmeyecek bir mesafede takip etmek	1	2	3	4	5	6
33	Sollama yapan sürücüye kolaylık olması için hızınızı onun geçiş hızına göre ayarlamak	1	2	3	4	5	6
34	Arkamdan hızla gelen aracın yolunu kesmemek için sollamadan vazgeçip eski yerinize dönmek	1	2	3	4	5	6
35	Yayaların karşıdan karşıya geçebilmeleri için geçiş hakkı sizde dahi olsa durarak yol vermek	1	2	3	4	5	6
36	Aracınızı park ederken diğer yol kullanıcılarının (yayalar, sürücüler vb.) hareketlerini sınırlamamaya özen göstermek	1	2	3	4	5	6
37	Aracınızı kullanırken yol kenarında birikmiş suyu ve benzeri maddeleri yayaların üzerine sıçratmamaya dikkat etmek	1	2	3	4	5	6

Appendix J: Driver Skill Inventory (DSI)

Özellikle araç kullanmanın farklı yönlerinde olmak üzere sürücüler arasında pek çok farklılıklar vardır. Lütfen **<u>SİZİN</u>** güçlü ve zayıf yönlerinizi size göre doğru olan seçeneği işaretleyerek belirtiniz.

1=Çok zayıf	**2**= Zayıf	**3**=Ne zayıf ne güçlü	**4**= Güçlü	**5**= Çok güçlü

1	Seri araç kullanma	1	2	3	4	5
2	Sabırsızlanmadan yavaş bir aracın arkasından sürme	1	2	3	4	5
3	Hızlı karar alma	1	2	3	4	5
4	Yeterli takip mesafesi bırakma	1	2	3	4	5
5	Geriye kaçırmadan aracı yokuştan kaldırma	1	2	3	4	5
6	Sollama	1	2	3	4	5
7	Hız sınırlarına uyma	1	2	3	4	5
8	Gereksiz risklerden kaçınma	1	2	3	4	5
9	Trafik ışıklarına dikkatle uyma	1	2	3	4	5
10	Dar bir yere geri geri park edebilme	1	2	3	4	5

Appendix K: Attitudes Towards Disabled Drivers Scale (ADDS)

Aşağıda **ENGELLİ SÜRÜCÜLER** ile ilgili bazı ifadeler bulunmaktadır. Verilen ifadeye ne kadar katıldığınızı aşağıdaki derecelendirmeyi kullanarak cevaplayınız.

	1.Kesinlikle katılmıyorum	2.Katılmıyorum	3.Ne katılıyorum ne katılmıyorum	4.Katılıyorum	5.Kesinlikle katılıyorum
1.Engelli sürücüleri korumak devletin görevidir.	1	2	3	4	5
2.Engelli sürücüler trafik becerileri açısından engelsiz sürücülerden farklı değildir.	1	2	3	4	5
3.Engelli sürücüler trafik ortamlarında engelsiz sürücülere kıyasla daha kolay sinirlenmektedir.	1	2	3	4	5
4.Engelli sürücüler trafikte karşılaştıkları sorunları çözme konusunda yetersizdir.	1	2	3	4	5
5.Engelli sürücüler trafikte kendilerini korumasız hissederler.	1	2	3	4	5
6.Engellilerin trafikte yaşadığı sorunlar tüm toplumun problemidir.	1	2	3	4	5
7.Türkiye'de trafik ortamlarında engelli sürücülerin hareket alanı ve imkânları kısıtlıdır.	1	2	3	4	5
8.Trafikte araç kullanırken yakınlarımda engelli bir sürücü fark edersem daha temkinli olmam gerektiğini düşünürüm.	1	2	3	4	5
9.Trafikte engelli sürücü plakalı bir araca yakın araç kullanmayı güvenli bulmuyorum.	1	2	3	4	5
10.Aracımı park ederken engelli sürücü plakası gördüğüm araçların yanına park etmeyi güvenli bulmuyorum.	1	2	3	4	5
11.Genel trafik düzenlemeleri engelli sürücülere göre değil de engeli olmayanlara göre yapılmalıdır.	1	2	3	4	5
12.Engelli bireylerin de sürücü belgesi alması doğru bir uygulamadır.	1	2	3	4	5
13.Engelli sürücüler engelsiz sürücülere karşı duyarlı davranır.	1	2	3	4	5
14.Engellerinden dolayı engelli sürücülerden araç kullanma yetkinliği konusunda belli bir noktaya kadar beklenti içinde olabiliriz.	1	2	3	4	5
15.Trafik ortamlarında engelli ve engelsiz sürücülerle aynı sıcaklıkta iletişim kurulabilir.	1	2	3	4	5
16.Engelli sürücüler trafik ortamlarında engelsiz sürücülerin baş edebileceği her türlü zor durumla baş edebilirler.	1	2	3	4	5
17.Engelli bir sürücü trafik ortamının güvenli ulaşım amacına olumsuz etki eder.	1	2	3	4	5
18.Engelli insanlardan araç kullanmasını beklemek onlardan yapabileceklerinden fazlasını istemek olur.	1	2	3	4	5
19.Engelli bir sürücünün sürücülük becerileri konusunda kendini geliştirebileceğine inanmıyorum.	1	2	3	4	5
20.Araç kullanmak için yasal bir hakları olmasaydı engelli sürücülerin trafiğe çıkmasını engellemek isterdim.	1	2	3	4	5
21.Engelli sürücülerin trafik kazalarına neden olma olasılığı daha yüksektir.	1	2	3	4	5
22.Engelli sürücüler engelsiz sürücülerden daha düşük araç sürme becerisine sahiptir.	1	2	3	4	5
23.Trafik ortamlarında daha fazla sayıda engelli sürücünün araç kullanabilmesine yönelik düzenlemeler yapılmalıdır.	1	2	3	4	5
24.Engelli sürücüler de profesyonel sürücü olarak (örn. Otobüs şoförü, taksi şoförü) çalışabilmelidir.	1	2	3	4	5
25.Engelli sürücüler engelsiz sürücülere kıyasla diğer yol kullanıcılarıyla iletişimlerinde daha kompleksli davranırlar.	1	2	3	4	5
26.Ülkemizde engelli sürücülerin de trafik ortamından engelsiz sürücüler kadar faydalanabilmesi yönünde düzenlemeler yapılması için gerekli tüm kaynaklar kullanılmalıdır.	1	2	3	4	5
27.Trafik ortamlarında engelli sürücülerin bulunmasının bu ortamlardaki sosyal uyumu bozduğunu düşünüyorum.	1	2	3	4	5
28.Engelli sürücüler araç kullanırken engelsiz sürücülere oranla daha fazla hata yaparlar.	1	2	3	4	5
29.Engelli sürücüler engelsiz sürücülere kıyasla daha fazla trafik ihlali yaparlar.	1	2	3	4	5
30.Trafik ortamlarında uyum içinde olmak için insanlara engelli hakları konusunda eğitim verilmelidir.	1	2	3	4	5
31.Engelli sürücüler de engelsiz sürücüler kadar iyi araç kullanır.	1	2	3	4	5
32.Engelli sürücüler trafik ortamlarında engelsiz sürücülere kıyasla daha fazla yardımcı, destekleyici ve sosyal trafik ortamını rahatlatıcı davranışta bulunurlar.	1	2	3	4	5
33.Engelli sürücüler trafik ortamlarındaki kural ve düzenlemelere engelsiz sürücülere kıyasla daha fazla uyarlar.	1	2	3	4	5
34.Engelli sürücüler trafik ortamlarında engelsiz sürücülerden daha az saldırgan davranış sergiler.	1	2	3	4	5
35.Birçok engelli sürücü kendilerine trafik ortamında daha fazla hak ve ayrıcalık tanınması gerektiğini düşünür.	1	2	3	4	5

36.Engelli sürücüler engelsiz sürücülerle aynı sürüş performansına sahip olmayı beklememelidir.	1	2	3	4	5
37.Engelli sürücüler trafikte daha çok engelsiz sürücüler ile değil, diğer engelli sürücülerle etkileşim içinde olmak ister.	1	2	3	4	5
38.Engelli bir sürücü olsaydım trafik ortamlarındaki engelsiz sürücülere kıyasla daha fazla ilgi beklentisi içerisinde olurdum.	1	2	3	4	5
39.Engelli bir sürücü olsaydım trafik ortamlarındaki engelsiz sürücülere kıyasla daha fazla övgü beklentisi içerisinde olurdum.	1	2	3	4	5
40.Engelli sürücülerin diğer yol kullanıcılarına yönelik davranış şekilleri rahatsız edicidir.	1	2	3	4	5
41.Engellerinden dolayı engelli sürücülerin ehliyet alma sürecinde motor bilgisinden muaf tutulması doğru bir uygulamadır.	1	2	3	4	5
42.Engelli sürücüler trafik ortamlarında engelsiz sürücülere göre daha saygılı davranırlar.	1	2	3	4	5
43.Engelli sürücüler engelsiz sürücülere göre daha yardımseverlerdir.	1	2	3	4	5
44.Engelli sürücüler her ne kadar engellerine göre düzenlenmiş araç kullansalar da, trafik ortamına engelsiz sürücüler kadar hakim olamazlar.	1	2	3	4	5
45.Engelli sürücüler engelsiz sürücülere göre trafik kurallarına daha fazla uyarlar.	1	2	3	4	5
46.Otoparklardaki engelli park alanları konum, kullanım ve ulaşım kolaylığı açısından engelli sürücülere uygun planlanmıştır.	1	2	3	4	5
47.Engelli sürücüler için ayrılmış park yerlerinin sayısı yeterlidir.	1	2	3	4	5
48.Sürücü kurslarında engelli sürücülerin direksiyon eğitimi için kullanılabilecek donanıma sahip araçlar bulunmaktadır.	1	2	3	4	5
49.Ehliyet sınavları engelli sürücülerin engellerine uygun bir şekilde yapılmalıdır.	1	2	3	4	5
50.Engelli sürücülerin arıza ve kaza gibi durumlarda yardım isteyebileceği özel hatlar olmalıdır.	1	2	3	4	5

Appendix L: Turkish Summary

Trafik kazaları, dünyada meydana gelen ölüm ve kazaların başlıca sebeplerinden sayılmaktadır. Her yıl özellikle düşük ve orta gelirli ülkelerde yaklaşık 1.2 milyon insan trafik kazalarında hayatını kaybetmektedir (WHO 2015). Türkiye'de, Emniyet Genel Müdürlüğü verilerine bakıldığında, 2015 yılında 1.313.359 trafik kazası meydana geldiği ve bu kazalarda 304.421 kişi yaralanırken, 7.350 kişinin hayatını kaybettiği raporlanmıştır.

Trafik güvenliği dikkate alındığında, ülkenin çevresel faktörleri, trafik düzenlemeleri ve araç özellikleri temel ana faktörlerden sayılmaktadır. Trafikte meydana gelmesi muhtemel olaylar, bu faktörlerden ve bu faktörlerin, insan faktörü ile etkileşiminden oluşmaktadır (Özkan, 2006).

Literatürde, sürücülükte insan faktörleri, genç sürücüler-yaşlı sürücüler, erkek sürücüler-kadın sürücüler gibi farklı gruplarla çalışılmıştır. Trafik ortamlarında, engellilik de sürücülüğü etkileyen bir faktör olmasına rağmen, engelli sürücüler grubunu trafikte insan faktörleri açısından ve engelli sürücülüğe yönelik tutum açısından ele alan çalışmaların eksikliği dikkat çekmektedir.

Sürücülükte insan faktörleri yol kullanıcılarının araç ve çevre ile fiziksel, fizyolojik, bilişsel, kişisel ve sosyal etkileşimine dayanmaktadır. Sürücülerin araç kullanmadaki aktif rolüne rağmen araç ve çevreden izole edilmiş bir sürücü performansı beklenmemelidir (Oppenheim ve Shinar, 2011). Sürücülükte temel insan faktörleri, 2 kategoride ele alınmaktadır. Sürücü davranışları kişinin nasıl araç kullanacağı ile ilgili alışkanlıklarına, seçimine ve motivasyonuna dayanırken, sürücü becerileri, sürücünün motor becerilerine ve güvenlik becerilerine dayanarak trafikte sergileyebileceği en iyi performansı göstermesidir (Elander, West ve French, 1993).

Sürücü davranışları ve kazalar arasındaki ilişkiyi ele alan çalışmalara dayanarak; sürücü davranışlarını ölçmek amacıyla 'Sürücü Davranışları Ölçeği (SDÖ)'

geliştirilmiştir (Reason, Manstead, Stradling, Baxter ve Campbell, 1990). Reason ve ark. (1990) sürücülerin trafikte sergilediği sapkın davranışları iki kategoride ele almıştır bunlar ihlaller ve hatalardır. Daha sonraki çalışmalarda ihlaller saldırgan ihlaller ve saldırgan amaç içermeyen sıradan ihlaller olmak üzere iki gruba ayrılmıştır (Lawton, Parker, Manstead ve Stradling, 1997). SDÖ'nün literatürde kullanılan bütün versiyonları sapkın sürücü davranışlarını ele alırken pozitif sürücü davranışlarını incelemek amacıyla 'Pozitif Sürücü Davranışları Ölçeği' geliştirilmiştir (Özkan ve Lajunen, 2005). Bu ölçekte temel alınan pozitif sürücü davranışları, sürücülerin diğer yol kullanıcılarını ve trafik ortamlarını koruyucu ve kollayıcı olmak amacıyla sergilediği davranışlar olarak tanımlanmaktadır.

Trafikte sürücülük becerilerinin iki ana öğesi olan algısal motor beceriler ve güvenlik becerilerini ölçmek amacıyla Lajunen ve Summala (1995) 'Sürücü becerileri ölçeği (SDE)'ni geliştirmiştir. Algısal motor beceriler, sürücülüğün teknik kısımları ile ilgili iken güvenlik becerileri sürücünün trafikte güvenliğe yönelik önlemleri ve tutumu ile ilgilidir.

Literatürde, trafik ortamlarında sürücü davranışlarının ve sürücü becerilerinin, yaş (Rimmö ve Blomqvist, 2002; Williams, 2006), cinsiyet (Rimmö, 2002; Bener ve ark., 2013), deneyim (Mourant ve Rockwell, 1972; Roman, Poulter, Parker, Mckenna ve Rowe, 2015), kişilik faktörleri (Constantinou, Panayiotou, Konstantinou, Ladd ve Kapardis, 2011; Lucidi, Mallia, Lazuras ve Violani, 2014) ve kurum kültürü/milli kültür (Öz, Özkan ve Lajunen, 2013; Öz, Özkan ve Lajunen, 2014) gibi farklı faktörlerle ilişkisini inceleyen bir çok çalışma bulunmaktadır.

Yukarıda bahsedilen bütün faktörler engelsiz sürücüler grubunu göz önüne alarak çalışılmıştır. Trafik ortamlarında engellilik de önemli bir insan faktörü iken; literatürde engelliliği ele alan çalışmaların eksikliği dikkat çekmektedir. 2015 yılındaki veriler dikkate alındığında trafikte 45,942 H sınıfı ehliyet sahibi engelli sürücünün bulunduğu ve 119,758 engelli sürücü aracı olduğu vurgulanmıştır (Emniyet Genel Müdürlüğü-Trafik Araştırma Merkezi Müdürlüğü, 10 Mart, 2016). Bu sayılara bakıldığında engelli sürücülerin trafik ortamlarında azımsanmayacak sayıda olduğu ve temel faktörler

açısından incelenmesinin önemi dikkat çekmektedir. Bu sürücü grubunun insan faktörleri açısından incelenmesinin öneminin yanı sıra; engelli sürücülerin trafik ortamlarına ve diğer yol kullanıcılarına yönelik tutumunu ve aynı şekilde diğer yol kullanıcılarının engelli sürücülere yönelik tutumunu belirlemek trafik ortamlarını daha iyi analiz etmek açısından önemlidir.

Dünya Sağlık Örgütü (2001), engelliği engelli bireyin yaşamında etki yaratan ve birçok açıdan değerlendirilebilecek bir durum olarak tanımlamıştır. Engelliliği oluşturan sağlık problemleri ve fiziksel yaralanmalar engelli bireyin fiziksel, zihinsel ve duygusal açısından zorluklar yaşamasına neden olmaktadır. Çevresel faktörlerin yarattığı engellerle beraber engelli bireyin işlevsel yaşamasına negatif etkisi olan diğer faktörler de engellilik tanımı içinde değerlendirilmektedir (Altman, 2014).

Pratkanis, Turner ve Murphy (2014) tutumu yalnızca bilişsel süreçleri değil muhakemeyi, algıyı ve bunun sonucunda davranışları etkileyen bir süreç olarak tanımlamıştır. Bunun yanı sıra tutum ile davranış arasındaki ilişkiye dayanarak toplumun her kesiminde tutumların iyi gözlemlemesi ve şekillendirilmesi gerektiğini belirtmişlerdir. Chan, Lee, Yuen ve Chan (2002) bir önceki çalışma ile paralel olarak tutum ve tutumun öğeleri olan bilişsel, duygusal ve davranışsal faktörlerin bireyin düşünce yapısını, duygularını ve toplumda sergilediği davranışları etkilediğini vurgulamıştır. İlgili literatür incelendiğinde toplumda engelli bireylere yönelik tutumu belirlemek ve geliştirmek amacıyla; eğitim alanında (örn., Moore ve Nettelback, 2013; Wozencroft, Pate ve Griffiths, 2015), iş alanında (örn., Ang, Ramayah ve Vun, 2013; Boman, Kjellberg, Danermark ve Boman, 2015), kültür alanında (örn., Kassah, Kassah ve Agbota,2014; Altıparmak ve Sarı, 2012) ve sanat alanında (örn., Bang ve Kim, 2015) yapılmış çalışmalar dikkat çekicidir.

İlgili literatür incelendiğinde engelli bireylerin katıldığı bütün sosyal alanların ayrıntısıyla incelenmediği dikkat çekmektedir. Engelli bireylerin aktif olarak katıldığı sosyal alanlardan bir diğeri de trafik ortamlarıdır. Engelli bireyler trafik ortamlarının hem sürücü olarak katıldığı hem de diğer yol kullanıcılarıyla aktif iletişim içerisinde olduğu önemli bir yaşam alanıdır. Araç ve çevre faktörünün yanı sıra trafik

ortamlarının diğer öğesi olan insan faktörünü engelli sürücülerin davranış ve özelliklerini anlamak amacıyla incelemek de trafikte engelli sürücüleri anlamak ve gerekli düzenlemeleri planlamak açısından önemli rol oynayacaktır. Bu çalışmada engellilik bilişsel ve algısal problemlerden bağımsız olarak sadece ortopedik engeller kapsamında ele alınmıştır. Ampütasyon, çocuk felci (parapleji) ve tetrapleji gibi bireye araç kullanma esnasında fiziksel engel yaratan problemler ortopedik engeller olarak tanımlanmıştır (Prasad ve ark., 2006).

İlgili literatürde belirtildiği üzere sürücülükte insan faktörleri trafik güvenliği ile doğrudan ilişkilidir (Elander ve ark., 1993; Lajunen, Parker ve Summala, 2004). Birçok çalışmada farklı sürücü gruplarının insan faktörleri ile diğer ilgili faktörler arasındaki ilişki incelenirken; trafik ortamlarının bir diğer aktif katılımcısı olan engelli sürücüler ile ilgili detaylı çalışmaların eksikliği dikkat çekmektedir. Bu çalışmanın üç temel amacı bulunmaktadır. İlk olarak, engelli sürücüleri sürücülükte insan faktörleri açısından incelemek ve engelli sürücülüğü ayrıntılı olarak öğrenmek amaçlanmıştır. Bu bağlamda yalnızca engelli sürücülerin kendi sürücü davranışları ve sürücü becerileriyle ilgili kişisel beyanına bağlı kalınmamış; engelsiz sürücülerden de engelli sürücülerin sürücü davranışları ve sürücü becerileri hakkında bilgi alınmıştır. İkinci olarak, engelli sürücülerin ve engelsiz sürücülerin engelli sürücülüğe yönelik tutumlarını belirlemek amacıyla dünya literatüründe bir ilk olan 'Engelli Sürücülere Yönelik Tutum Ölçeği' (ESYTÖ) geliştirmek hedeflenmiştir. Son olarak, sürücülükte insan faktörleri ve engelli sürücülüğe yönelik tutumlar arasındaki ilişkiyi incelemek amaçlanmıştır.

Çalışmanın genel amaçları şunlardır;

- Trafikte engelli sürücülüğe yönelik tutumları belirlemek amacıyla bir tutum ölçeği geliştirmek
- Engelli ve engelsiz sürücülerin temel demografik bilgileri ile çalışmada kullanılan değişkenler arasındaki ilişkiyi test etmek
- Engelli ve engelsiz sürücüleri temel demografik değişkenler açısından karşılaştırarak incelemek

- Engelli ve engelsiz sürücüleri sürücü davranışları, sürücü becerileri ve engelli sürücülüğe yönelik tutumlar açısından karşılaştırarak incelemek
- Engelli sürücülerin kendi sürücü davranışları ve sürücü becerilerini değerlendirmesi ile engelli sürücülüğe yönelik tutumları arasındaki ilişkiyi test etmek
- Engelsiz sürücülerin engelli sürücülerin sürücü davranışları ve sürücü becerilerini değerlendirmesi ile engelli sürücülüğe yönelik tutumları arasındaki ilişkiyi test etmek

Bu amaçlar doğrultusunda bu çalışma iki ana bölümden oluşmaktadır. Çalışmanın ilk bölümünde engelli sürücülerin trafik ortamlarına ve diğer yol kullanıcılarına; diğer sürücü gruplarının da engelli sürücülüğe ilişkin tutumlarını belirlemek amacıyla detaylı mülakatlar düzenlemek ve bu mülakatlar sonucunda 'Engelli Sürücülere Yönelik Tutum Ölçeği' geliştirmek amaçlamıştır. Çalışmanın ikinci kısmında ise geliştirilen tutum ölçeği ile elde edilen veriler ve sürücülükte insan faktörleri açısından elde edilen veriler yukarıda bahsedilen amaçlar doğrultusunda değerlendirilmiştir.

ÇALIŞMA I: TRAFİKTE ENGELLİ SÜRÜCÜLERE YÖNELİK TUTUMLAR: MÜLAKATLAR VE 'TRAFİKTE ENGELLİ SÜRÜCÜLERE YÖNELİK TUTUM ÖLÇEĞİ' GELİŞTİRME

Trafik ortamları da engelli bireylerin aktif olarak katıldığı sosyal alanlardan biri olmasına rağmen engelli sürücülüğe yönelik tutumları belirleme amacıyla geliştirilmiş bir ölçek bulunmamaktadır. Bu çalışmada engelli ve engelsiz sürücüler ile yarı yapılandırılmış mülakatlar düzenlenerek hem engelli sürücülerin trafik ortamlarına ve diğer yol kullanıcılarına; hem de diğer yol kullanıcılarının engelli sürücülüğe yönelik tutumunu belirlemek amaçlanmıştır.

Çalışmaya toplam 12 engelli ve 16 engelsiz sürücü olmak üzere 28 aktif sürücü katılmıştır. Mülakatlardan elde edilen sonuçlara göre bütün katılımcılar haftada birkaç gün ile her gün arasında değişen araç kullanma alışkanlığına sahiptir. ODTÜ etik komitesinden gerekli izinler alındıktan sonra Engelsiz ODTÜ Birimi ziyaret edilerek

bu birime üye bütün engelli bireylerin mail aracılığı ile çalışmaya katılım duyurusu yapılmıştır. Gönüllü olarak çalışmaya katılmayı kabul eden engelli sürücüler ile iletişime geçilmiş ve mülakatlar düzenlenmiştir. Mersin ve Ankara'da devlet dairelerinde çalışan bazı engelli sürücüler ile bağlantı kurularak çalışmaya katılmayı kabul eden gönüllüler ofislerinde ziyaret edilmiştir. Engelli sürücülerle yapılan mülakatlar tamamlandıktan sonra engelsiz sürücüler Ankara, İstanbul ve Mersin'den seçilmiştir. Katılımcılar kişisel bilgi formunu doldurduktan sonra araştırmacının hazırladığı sorular mülakatlar içerisindeki katılımcılara sunulmuş ve cevaplar not edilmiştir. Mülakatlar sürecinde hazırlanmış bir mülakat formu olmasına rağmen mülakatlar bilgi eksikliğine sebebiyet vermemek amacıyla yarı yapılandırılmış şekilde düzenlenmiştir.

Mülakat formu literatürdeki ilgili tutum ölçekleri incelenerek hazırlanmıştır (Örn., Yuker, Block ve Young, 1970; Aycan, 2005 ve Koca-Atabey, 2010). Bu ölçeklerden engelli bireylerin genel sorunlarını yansıtan ve trafik ortamlarına uyarlanabilecek maddeler belirlenmiştir. Ayrıca engelli sürücülüğün doğasını anlamak amacı ile ve engelli sürücülerin muhtemel problemleri hakkında bilgi toplamak amacı ile bazı bilgilendirici sorular hazırlanmıştır. Mülakat formunun son hali 14 maddeden oluşmaktadır. Bu maddeler sürücü kursu süreci, ehliyet için sağlık raporu alma süreci, engelli sürücülerin trafikte yaşadığı problemler, engelli sürücülüğe yönelik genel tutum, engelli ve engelsiz sürücüler arasındaki bilgi, beceri, trafik kurallarına uyma, trafik ortamlarını koruma gibi konulardaki farklılıkları ele almıştır. Bunun yanı sıra engelli ve engelsiz sürücülerin trafikte yaşadığı negatif ve pozitif deneyimler hakkında da bilgi alınmıştır.

Mülakat bulguları nitel analiz yöntemi kullanılarak incelenmiştir. Soruların içerik analizi iki araştırmacı tarafından değerlendirilmiş ve ayrıştırıcı cevaplar belirlenmiştir. Bazı sorular içerik açısından benzerlik gösterdiği için beraber değerlendirilmiş, bazı sorular ise içeriğine göre alt kategorilere ayrılarak içerik analizi yapılmıştır. Bu içerik analizinden elde edilen sonuçlar ve engelli ve engelsiz sürücülerden toplanan bilgiler 'Engelli Sürücülere Yönelik Tutum Ölçeği'ni geliştirmek ve engelli sürücülüğü

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ayrıntılı bir şekilde anlamak açısından temel oluşturmuştur. Mülakat bulguları engelli sürücülerin diğer engelli sürücülere olan tutumunun pozitif olduğunu fakat bu sürücü grubunun engelsiz sürücülerin engelli sürücülüğe yönelik tutumunu daha negatif algıladığını göstermiştir. Bunun yanı sıra engelli sürücülerin ehliyet olma sürecinde ve sağlık raporu alma sürecinde daha fazla problem yaşadığı gözlemlenmiştir. Trafikle ilgili deneyimler sorulduğunda ise engelli sürücüler daha çok negatif yaşanmış olaylardan bahsederken engelsiz sürücüler kendi gruplarını engelli sürücülere yönelik duyarlı davranışlarından bahsetmiştir. Engelli ve engelsiz sürücüler arasındaki farklar sorulduğunda engelli sürücüler kendilerinin teknik eğitim sürecinin engelsiz sürücülerden farklı olmadığını belirtmiştir. Engelsiz sürücüler için ise engelli sürücülerin teknik eğitim süreçleri hakkında bilgi sahibi olmadığını belirtirken bazı engelsiz sürücüler engelli sürücülerin trafikte teknik bilgiye ihtiyaç duymayacağını belirtmiştir. Trafikte engelli sürücülerin yaşadığı negatif deneyimler, engelsiz sürücülerin sergilediği ihlal ve hata davranışlarının engelli sürücüleri de hataya sürüklemesinden kaynaklanmaktadır. Son olarak engelli park yerlerinin sayısının azlığı ve trafikte çevresel faktörlerin engelli sürücülere ek engeller ve zorluklar yaratması engelli sürücülerin sıklıkla belirttiği problemler arasındadır.

İçerik analizinin tamamlanmasının ardından ESYTÖ'yü geliştirmek amacıyla literatür taraması yapılmıştır. İlgili literatürde bulunan bütün tutum ölçekleri incelenmiş ve trafik ortamlarına uyarlanabilecek maddeler belirlenmiştir. Bu ölçekler '*Attitudes towards Disabled People Scale (ATDP;* Yuker ve ark., 1970)*', 'Attitudes towards Employment of Disabled People* (Aycan, 2005)*', 'Multidimensional Attitudes Scale Toward Persons with Disabilities (MAS,* Findler ve ark., 2007)*' ve 'Attitudes towards Disabled People Scale* (Koca-Atabey, 2010)*'dir.*

İçerik analizi sonuçları ve literatür taraması sonunda belirlenen maddeler birleştirilerek ESYTÖ'nün son hali 4 faktör ve 65 madde olarak belirlenmiştir. Faktör isimleri, trafik ortamlarında yeterlilik, sosyal etkileşim ve beceri, empati ve trafikte sürücü hakları olarak belirlenmiştir. Madde ve faktörleri içeren bir form hazırlanmış ve bu formda tutumun 3 öğesi olan davranışsal, bilişsel ve duygusal öğeler de başlık

olarak yerleştirilmiştir. Bu formun ilk sayfasında faktör boyutlarının açıklaması ve tutumun üç öğesinin tanımlaması yapılmıştır. Trafik ortamlarında uzman üç araştırmacı tarafından maddelerin hangi boyut altına yerleştirilebileceği, dil ve içerik uyumu ve tutumun hangi öğesini yansıttığı değerlendirmesi yapılmıştır. En az iki araştırmacı tarafından aynı boyuta ve tutum öğesine uygun bulunan maddeler ölçekte tutulmuştur. Uzman yorumları dikkate alınarak maddeler üzerinde dil ve içerik düzenlemeleri yapılmıştır. Ölçeğin son hali 50 madde ve 4 faktör olarak belirlenmiştir.

İlgili literatür incelendiğinde engelli bireyler ve engelli bireylerin problemlerini inceleyen çalışmalar, hem araştırmacılara hem de kural koyuculara engelli bireyleri tanıma ve onların sorunlarına çözüm bulma imkanı tanımıştır. Bu açıdan bakıldığında bu çalışma, engelli ve engelsiz sürücülerden engelli sürücülük hakkında bilgi toplayarak literatüre yeni bir katkı sağlamaktadır. Bunun yanı sıra mülakatlar sürecinde engelsiz sürücülerin beyanına dayanarak engelli sürücülüğe yönelik farkındalığın arttığı gözlemlenmiştir. Literatüre bir diğer katkı olarak bu çalışmada düzenlenen mülakat sonuçları yeni bir tutum ölçeği olan ESYTÖ'yü geliştirmek için temel oluşturmuştur. Engelli ve engelsiz sürücülerin engelli sürücülüğe bakış açısı hakkında bilgi toplanan bu çalışma ve geliştirilen tutum ölçeği gelecek çalışmalarda engelli sürücülüğü daha iyi tanımak açısından dünya literatürüne önemli katkılar sağlama potansiyeline sahiptir.

ÇALIŞMA 2 (ANA ÇALIŞMA): ENGELLİ SÜRÜCÜLERE YÖNELİK TUTUMLAR VE SÜRÜCÜLÜKTE İNSAN FAKTÖRLERİ: ENGELLİ VE ENGELSİZ SÜRÜCÜLER

Literatürde engelli sürücülüğü araç ve çevresel faktörler açısından inceleyen birçok çalışma (Monacelli ve ark., 2009; Prasad ve ark., 2006) bulunmasına rağmen sürücülükte insan faktörleri açısından engelli sürücüler ile yürütülmüş çalışmaların eksikliği dikkat çekmektedir. Bununla beraber, engelsiz sürücüleri, yaş (Rimmö ve Hakamies-Blomqvist, 2002; Winter ve Dodou, 2010), cinsiyet (Bener ve ark., 2013; Özkan ve Lajunen, 2006) ve deneyim (Mccartt ve ark., 2009; Waller ve ark., 2001) gibi bireysel faktörler açısından ele alan çalışmalar mevcut iken engelli sürücüleri

tanımak ve anlamak amacı ile yapılmış çalışmalar bulunmamaktadır. Bu çalışmada ilk olarak engelli ve engelsiz sürücülerin engelli sürücülüğe yönelik tutumlarını önceki çalışma sürecinde geliştirilen ETYSÖ kullanarak belirlemek amaçlanmıştır. Buna ek olarak engelli sürücülerin sürücü davranış ve sürücü becerileri hakkında bilgi toplamak ve engelli sürücüler ile engelsiz sürücülerin sürücülükte insan faktörleri açısından farklılıkları ve benzerliklerini incelemek hedeflenmiştir.

Bu çalışmaya 189 engelli 349 engelsiz sürücü olmak üzere toplam 538 aktif sürücü katılmıştır. Katılımcılar, Ankara, Mersin, İstanbul, İzmir, Kahramanmaraş ve Gaziantep olmak üzere Türkiye'nin çeşitli illerinden seçilmiştir. Engelli sürücüler, vücutlarında ortopedik engeli bulunan bireylerdir. Ortopedik engelli olmalarına rağmen sadece 176'sı H sınıfı ehliyet sahibidir. Bunun sebebi Türkiye'deki yasal düzenlemelerin belirlediği sağlık raporu alma sürecine dayanmaktadır. Engelli sürücülerin 159'u (%84.1) erkek katılımcılardan, 30'u (%15.9) ise kadın katılımcılardan oluşmaktadır. Engelli sürücülerin yaş aralığı 20 ile 70 arasında değişiklik göstermektedir. Engelsiz sürücülerin ise 221'i (%63.3) erkek katılımcılardan oluşurken, 128'i (%36.7) kadın katılımcılardan oluşmaktadır. Engelsiz sürücüler grubunun yaş aralığı 18 ile 75 arasında değişmektedir.

ODTÜ Etik Komitesinden gerekli izinler alındıktan sonra engelli sürücülere ulaşmak amacıyla engelli bireylerin üye olduğu sosyal medya blogları, dernekler ve tekerlekli basketbol takımları ile iletişime geçilmiştir. İlk olarak engelli bireylerin birbiri ile iletişim kurmak amacı ile kullandıkları sosyal medya bloglarında çalışma hakkında bilgi verilmiş ve gönüllü katılımcıların ulaşabilmesi açısından anketlerin online versiyonlarını içeren 'Qualtrics' veri toplama sisteminin linki paylaşılmıştır. Daha sonra Türkiye'nin çeşitli illerinde bulunan dernekler ve tekerlekli sandalye basketbol takımları çalışma hakkında bilgilendirilmiş ve gönüllü engelli sürücüler anketleri elden veya 'Qualtrics' veri toplama sistemi üzerinden doldurmuştur. Çalışmanın ikinci aşamasında engelsiz sürücüler ile iletişime geçilmiştir. Bu sürücü grubuna ulaşmak için yine sosyal medya blogları, kişisel iletişim yolu ile ulaşılan sürücüler ve ODTÜ ve Ufuk Üniversitesi'nden çalışmaya gönüllü katılım sağlamak isteyen sürücüler ile

iletişime geçilmiştir. Elden anket yolu ile toplanan verilerin yanı sıra ODTÜ ağında kullanılan 'SONA' katılımcı yönetim yazılımı ve 'Qualtrics' anket platformu online anket sağlamak amacı ile kullanılmıştır. Katılımcılara, ilk olarak bilgilendirilmiş onam formu verilmiştir. Daha sonra katılımcıların yaşı, cinsiyeti, eğitimi, sürücülük tecrübesi, sürücü belgesi, engellilik durumu, son bir yıl içerisinde yapılan kilometre, araç kullanma sıklığı, son üç yılda karışılan aktif kaza, son üç yılda karışılan pasif kaza ve son üç yılda alınan trafik cezası hakkında bilgi almak amacıyla kişisel bilgi formu verilmiştir. Daha sonra katılımcıların kendi sürücü davranışları ile ilgili bilgi almak amacı ile pozitif sürücü davranışlarını da kapsayan ve 37 maddeden oluşan 'Sürücü Davranışları Anketi (SDA)-Kendi' diğer sürücü grubunun sürücü davranışları hakkında bilgi almak içinse yine pozitif sürücü davranışlarını da kapsayan ve 37 maddeden oluşan 'Sürücü Davranışları Anketi (SDA)-Diğer' kullanılmıştır. Aynı şekilde katılımcıların kendi sürücü becerileri ile ilgili bilgi almak amacı ile 10 maddeden oluşan 'Sürücü Becerileri Envanteri (SBE)-Kendi' diğer sürücü grubunun sürücü becerileri hakkında bilgi almak içinse 'Sürücü Becerileri Envanteri (SBE)-Diğer' kullanılmıştır. Son olarak bu çalışma kapsamında geliştirilen ve trafikte engelli sürücülüğe yönelik tutumu belirlemek amacı ile kullanılan EYTSÖ her iki sürücü grubuna da verilmiştir.

Analizlere ilk önce çalışma 1 kapsamında geliştirilen EYTSÖ'nün faktör analizi yapılarak başlanmıştır. 50 maddelik EYTSÖ '*Principal Axis Factoring (PAF)*' yöntemi kullanılarak faktör analizi yapılmıştır. Analiz sonucunda 11 madde hiçbir faktöre yüklenmediği için, birden fazla faktöre aynı anda yüklendiği için veya ilgili faktörün içeriği ile uyum sağlamadığı için ölçekten çıkarılmıştır. 4 faktörlü yapı en uygun model olarak bulunmuştur. Fakat çalışma 1'de belirlenen faktör isimleri düzenlenmiş maddelerin ve faktör analizi sonucunda çıkan faktör yapısının içeriğini tam yansıtmadığı için yeniden düzenlenmiştir. Yeni faktör isimleri, 'Genel Trafik Ortamlarına Uyum (UYUM)', 'Trafikte Engelli Sürücü Hakları (HAKLAR)', 'Trafikte Sosyal Yeterlilik (S-YETERLİLİK)' ve 'Trafikte Teknik Yeterlilik (T-YETERLİLİK)' olarak belirlenmiştir.

Daha sonra engelli ve engelsiz sürücüleri temel demografik değişkenler olan yaş ve son bir yılda kat edilen mesafe açısından karşılaştırmak amacı ile bağımsız gruplar t-test analizi yapılmıştır. Analiz sonuçlarına göre engelli sürücülerin yaşı engelsiz sürücülerden daha yüksek bulunmuştur. Son bir yılda kat edilen mesafe açısından analiz sonuçlarına göre beklenenin aksine engelli sürücüler, engelsiz sürücülerden daha fazla kilometre rapor etmiştir.

Engelli ve engelsiz sürücüleri cinsiyet, son üç yılda karışılan kaza sayısı ve son üç yılda alınan trafik cezası açısından karşılaştırmak amacı ile Pearson Ki-Kare Testi uygulanmıştır. Cinsiyet açısından iki grupta bulunan erkek sürücülerin oranları neredeyse eşit bulunmuştur. Engelli ve engelsiz sürücülerin kendi örneklemlerinde kadın sürücülere oranla daha fazla erkek sürücü bulunmasının sebebi olarak trafikte erkek sürücülerin varlığının daha fazla olması gösterilebilir. Bu fazlalığın sebebi Bener ve ark., 2013 tarafından erkek sürücülerin profesyonel sürücü olarak daha fazla işe alınması ve erkek sürücülerin daha fazla araç sahibi olması olarak açıklanmıştır. Diğer Ki-Kare testlerinde engelli ve engelsiz sürücüler arasında son üç yılda kazaya karışma ve son üç yılda alınan trafik cezası açısından fark olmadığı görülmüştür.

Engelli ve engelsiz sürücüleri temel çalışma değişkenleri açısından karşılaştırmak amacı ile tekrarlanan ölçü faktörü içeren karma modelli ANCOVA analizleri yapılmıştır. İlk olarak engelli ve engelsiz sürücüleri kendi sürücü davranışları ve diğer grubu değerlendirdikleri sürücü davranışları açısından karşılaştırmak amacı ile 2 (sürücü grubu) X 2 (değerlendirme tipi: kendi veya diğer) X 5 (SDA faktörleri: saldırgan ihlal, sıradan ihlal, hata, dikkatsizlikler/ihmaller ve pozitif sürücü davranışları) tekrarlanan ölçü faktörü içeren karma modelli ANCOVA analizi yapılmıştır. Yaş, cinsiyet ve son bir yılda kat edilen yol kontrol değişkeni olarak analize dâhil edilmiştir. Bu analizde yalnızca engelli ve engelsiz sürücüler kendi ve diğer sürücü davranışlarını değerlendirme açısından karşılaştırılmamış, aynı zamanda bu analiz SDA faktörlerinin kendi içerisinde karşılaştırmasının yapılmasına olanak sağlamıştır. Dünya literatüründe ilk defa SDA, belli bir sürücü grubundan diğer sürücü grubunun sürücü davranışları hakkında bilgi almak amacıyla kullanılmıştır.

Çalışmanın önemli bulguları dikkate alındığında engelli ve engelsiz sürücüler diğer grubun sürücü davranışlarını değerlendirdiğinde (SDA-Diğer) engelli sürücüler engelsiz sürücüler için diğer grubun engelli sürücülere yönelik değerlendirmesinden daha fazla saldırgan ihlal, sıradan ihlal ve hata raporlamıştır. Bunun aksine engelsiz sürücüler ise engelli sürücülerin engelsiz sürücülere yönelik pozitif sürücü davranışı değerlendirmesine kıyasla diğer sürücü grubu için daha fazla pozitif sürücü davranışı raporlamıştır. Çalışma 1 kısmının içerdiği mülakat sürecinde gözlemlendiği üzere engelli sürücüler, engelsiz sürücüleri değerlendirirken genellikle erkek sürücüleri değerlendirdiği için daha fazla sapkın sürücü davranışı raporladıkları düşünülmektedir. Engelsiz sürücüler ise mülakat sürecinde genellikle engelli sürücüler grubu hakkında bilgi sahibi olmadığını beyan ederken; bu sürücü grubunun pozitif özelliklerini yüceltmeyi tercih etmiştir. Bu bağlamda mülakat sonuçları ve analiz sonuçları tutarlı olarak değerlendirilebilir. Bu iki sürücü grubu kendi sürücü davranışlarını değerlendirdiğinde (SDA-Kendi), istatistiksel olarak tek anlamlı sonuç engelsiz sürücülerin, engelli sürücülere oranla kendileri için daha fazla pozitif sürücü davranışı beyan etmesidir. Yine engelli ve engelsiz sürücülerin kendileri için yaptıkları sürücü davranışı değerlendirmeleri (SDA-Kendi) ve diğer sürücü grubu için yaptıkları değerlendirmeler (SDA-Diğer) karşılaştırıldığında engelli sürücülerin engelsiz sürücüler için yaptığı saldırgan ihlal, sıradan ihlal, hata, dikkatsizlikler/ihmaller değerlendirmelerinin aynı faktörlerde kendileri için yaptıkları değerlendirmelerden daha fazla olduğu görülmüştür. Bunun aksine engelli sürücüler engelsiz sürücü değerlendirmelerine kıyasla kendileri için daha fazla pozitif sürücü davranışı beyan etmiştir. Engelli sürücülerin kendilerine oranla engelsiz sürücüler için daha fazla sapkın davranış beyan etmesi mülakat sürecinde karşılaşılan sonuçları desteklemekte ve o sonuçlar tarafından desteklenmektedir.

Diğer ANCOVA analizinde ise engelli ve engelsiz sürücüleri kendi sürücü becerileri ve diğer grubu değerlendirdikleri sürücü becerileri açısından karşılaştırmak amacı ile 2 (sürücü grubu) X 2 (değerlendirme tipi: kendi veya diğer) X 2 (SBE faktörleri: algısal motor beceriler ve güvenlik becerileri) tekrarlanan ölçü faktörü içeren karma modelli ANCOVA analizi yapılmıştır. Yaş, cinsiyet ve son bir yılda kat edilen yol kontrol

değişkeni olarak analize dâhil edilmiştir. Dünya literatüründe ilk defa SDA, belli bir sürücü grubundan diğer sürücü grubunun sürücü davranışları hakkında bilgi almak amacıyla kullanılmıştır. Engelli ve engelsiz sürücüler kendi sürücü becerilerini değerlendirdiğinde bu iki sürücü grubu arasında algısal motor becerileri ve güvenlik becerileri açısından anlamlı bir fark bulunmamıştır. Bu iki sürücü grubu diğer grubun sürücü becerilerini değerlendirdiğinde ise (SBE-Diğer) engelli sürücüler, engelsiz sürücüler için daha güçlü algısal motor beceriler beyan ederken; engelsiz sürücüler, engelli sürücüler için daha güçlü güvenlik becerileri rapor etmiştir. Bu iki grubun kendi sürücü becerilerini değerlendirmesi (SBE-Kendi) ve diğer sürücü grubunun sürücü becerilerini değerlendirmesi (SBE-Diğer) karşılaştırıldığında bulunan tek istatistiksel anlamlı sonuç engelsiz sürücülerin kendi algısal motor becerilerini değerlendirmesinin diğer grubu değerlendirmesinden daha yüksek olduğudur.

Engelli ve engelsiz sürücüleri, engelli sürücülere yönelik tutum açısından karşılaştırmak amacı ile tek yönlü ANOVA analizi yapılmıştır. Bulgulara göre engelli sürücülerin kendi sürücü gruplarının genel trafik ortamlarına uyum, trafikteki sosyal yeterlilik ve teknik yeterlilik faktörlerine olan tutumu engelsiz sürücülerin bu faktörlere olan tutumundan daha pozitiftir.

Grup karşılaştırmaları yapıldıktan sonra engelli sürücülerin kendi sürücü davranışları ve sürücü becerilerini değerlendirmeleri ile engelli sürücülüğe yönelik tutumları arasındaki ilişkiyi incelemek amacıyla iki farklı seri hiyerarşik regresyon analizi yapılmıştır. Bu analizlerde yaş, cinsiyet ve son yılda kat edilen kilometre değişkenleri kontrol edilmiştir. İlk olarak ESYTÖ faktörleri ve engelli sürücülerin SDA-Kendi skorları arasındaki ilişki incelenmiştir. Bulgurlara göre ESYTÖ'nün UYUM faktörü ve SDA-kendi ölçeğinin saldırgan ihlal, sıradan ihlal, hata ve dikkatsizlikler/ihmaller faktörleri arasında negatif bir ilişki bulunmuştur. Bunun aksine UYUM ve SDA-kendi ölçeğinin pozitif sürücü davranışları faktörü arasında pozitif bir ilişki saptanmıştır. Bu sonuçlar engelli sürücülerin kendilerini trafik ortamlarına adapte olmuş görmedikleri sürece daha fazla sapkın davranış sergileyeceğini göstermektedir. Bir başka dikkat çekici bulgu olarak ESYTÖ'nün T-YETERLİLİK faktörü ile saldırgan ihlaller

arasında pozitif yönlü bir ilişki bulunmuştur. Diğer hiyerarşik regresyon analizi sonuçları incelendiğinde ESYTÖ'nin S-YETERLİLİK faktörü ile hem algısal-motor beceriler arasında hem de güvenlik becerileri arasında pozitif yönde anlamlı bir ilişki bulunmuştur.

Engelli sürücülerin kendi sürücü davranışları ve sürücü becerilerini değerlendirmeleri ile engelli sürücülüğe yönelik tutumları arasındaki ilişkiyi incelendikten sonra engelsiz sürücülerin engelli sürücülerin sürücü davranışlarını ve sürücü becerilerini değerlendirmeleri ile engelli sürücülüğe yönelik tutumları arasındaki ilişki incelenmiştir. Bu amaç doğrultusunda hiyerarşik regresyon analizleri yapılmıştır. Bu analizlerde yaş, cinsiyet ve son yılda kat edilen kilometre değişkenleri kontrol edilmiştir. İlk olarak ESYTÖ faktörleri ve engelsiz sürücülerin SDA-Diğer skorları arasındaki ilişki incelenmiştir. Bulgulara göre ESYTÖ'nün UYUM ve S-YETERLİLİK faktörleri ile saldırgan ihlal, sıradan ihlal, hata ve dikkatsizlikler/ihmaller faktörleri arasında negatif yönlü bir ilişki bulunmuştur. Bunun aksine UYUM, HAKLAR, S-YETERLİLİK faktörleri ile SDA-Diğer'in pozitif sürücü davranışları arasında pozitif yönlü bir ilişki vardır. İkinci hiyerarşik regresyon analizi olarak ESYTÖ faktörleri ve engelli sürücülerin SBE-Diğer skorları arasındaki ilişki incelenmiştir. Sonuçlara göre UYUM ve S-YETERLİLİK faktörleri hem algısal-motor beceriler ile hem de güvenlik becerileri ile pozitif yönde ilişkilidir.

GENEL TARTIŞMA

Dünya literatüründe engelli sürücüler insan faktörleri açısından daha önce hiç çalışılmadığı için bu çalışmada ilk olarak ölçüm aracı geliştirilmesi hedeflenmiştir. Bu ölçek geliştirildikten sonra ana çalışmada kullanılarak engelli sürücülüğe yönelik bilgi hem engelli sürücülerden hem de engelsiz sürücülerden elde edilmiştir. SDA ve SBE ölçeklerinin kullanımına yeni bir yaklaşım olarak sadece sürücülerin kendi sürücü davranışlarını ve sürücü becerileri değerlendirmeleri istenmemiş, aynı zamanda diğer sürücü grubunun sürücü davranışları ve sürücü becerileri ile ilgili değerlendirmeler yapılmıştır. Çalışma 1 ve ana çalışma sonuçları bağlanarak literatürde ilk defa nitel ve nicel analiz sonuçları birleştirilerek engelli sürücülerin insan faktörleri ele alınmıştır.

Son olarak bu çalışmaya katılan engelsiz sürücülerin beyanı dikkate alındığında trafik ortamlarında engelli sürücülük ile ilgili bir farkındalık yaratılmıştır.

Bu çalışmanın veri toplama sürecinde bazı sınırlılıklar vardır. Özellikle engelli sürücülerin tekerlekli sandalye basketbol takımlarından seçilmesi bu grubun genellikle erkek ve yaşlı katılımcılardan oluşmasına neden olmuştur. Buna ek olarak örneklemin doğasından kaynaklanan sınırlılıkların başında engelli sürücülerin Türkiye'de bulunan büyük şehirlerden ve engelsiz sürücülerin çoğunlukla ODTÜ'den seçilmesi örneklemin engellilik konusunda daha bilinçli katılımcılardan oluşmasına sebep olmuştur. Bunun yanı sıra engelli sürücüler ve engelsiz sürücüler SDA-Diğer ve SBE-Diğer ölçekleri ile diğer grubu değerlendirirken genellikle trafikte daha önce sorun yaşadıkları sürücüleri düşündüklerini beyan etmiştir. Çalışmanın son sınırlılığı olarak sürücülerin kendi sürücü davranışlarını ve sürücü becerileri raporlarken deneyimlerinden, karakteristik özelliklerinden ve algılarından etkilendiğini göz ardı etmemek gerekir.

Bu çalışma trafik ortamlarında engelli sürücülerin varlığının tanımasını ve engelli sürücülerin insan faktörleri hakkında bilgi sahibi olunması konusunda önemli bir role sahiptir. Gelecek çalışmalar bu bilgiler ışığında trafik ortamlarında yeni düzenlemelerin ve gelişmelerin gerçekleşmesinde yol gösterici olacaktır. Son olarak yeni geliştirilen ESYTÖ'nün gelecek çalışmalarda kullanılması ile engelli sürücülüğe yönelik tutumlar hakkında daha kapsamlı bilgi sahibi olunabilecektir.

Appendix M: TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	☐
Sosyal Bilimler Enstitüsü	■
Uygulamalı Matematik Enstitüsü	☐
Enformatik Enstitüsü	☐
Deniz Bilimleri Enstitüsü	☐

YAZARIN

Soyadı : Bakır
Adı   : Besime Anıl
Bölümü : Trafik ve Ulaşım Psikolojisi

TEZİN ADI: Investigation and Comparison of Human Factors in Driving and Attitudes towards Disabled Drivers: A Study with Disabled and Non-disabled Drivers

TEZİN TÜRÜ :   Yüksek Lisans   ■   Doktora   ☐

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir.   ☐

2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir.   ☐

3. Tezimden bir (1) yıl süreyle fotokopi alınamaz.   ■

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: