

AN INVESTIGATION OF DRIVER BEHAVIORS: THEIR RELATIONSHIP  
WITH INTERPERSONAL PROBLEMS AND REPRESENTATIONS ON THE  
INTERPERSONAL CIRCUMPLEX

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**I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.**

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## **ABSTRACT**

### **AN INVESTIGATION OF DRIVER BEHAVIORS: THEIR RELATIONSHIP WITH INTERPERSONAL PROBLEMS AND REPRESENTATIONS ON THE INTERPERSONAL CIRCUMPLEX**

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The aim of the current study was to investigate the relationships between driver behaviors and interpersonal behaviors and detecting the positions of driver behaviors on interpersonal circumplex (IPC). Although there were many studies that explore the associations of driver behaviors with many different individual factors, driver behaviors are not studied directly with interpersonal problems. A total of 357 drivers (109 females, 246 males) participated in this study and they were given The Driver Behavior Questionnaire with the Positive Driver Behaviors Scale and Inventory of Interpersonal Problems for measuring the variables of the study. Bivariate Correlations and Hierarchical Regression Analyses were conducted to examine the relationship between study variables. Also, ipsatize data method was used for detecting the positions of drivers in the IPC. Results showed that, the characteristics of the relationships between driver behaviors and interpersonal

problems are in accordance with the representations of the driver behaviors on the IPC. Evidencing the interpersonal problems and aberrant / positive driver behaviors relationship was a theoretical contribution to the literature investigating personality and interpersonal relationships at traffic context. The results, the limitations and the critical remarks of the study were evaluated and discussed in detail.

**Keywords:** driver behaviors, interpersonal problems, interpersonal circumplex

## ÖZ

### SÜRÜCÜ DAVRANIŞLARININ İNCELENMESİ: KİŞİLERARASI PROBLEMLER İLE İLİŞKİLERİ VE KİŞİLERARASI DÖNGÜSEL MODEL ÜZERİNDEKİ TEMSİLLERİ

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Bu çalışmanın amacı, sürücü davranışları ile kişiler arası davranışlar arasındaki ilişkiyi araştırmak ve kişiler arası döngüsel model (KDM) üzerinde sürücü davranışlarının konumlarını saptamaktır. Sürücü davranışlarının pek çok farklı faktörle ilişkisini araştıran birçok çalışma olmasına rağmen, sürücü davranışları doğrudan kişiler arası problemlerle incelenmemiştir. Çalışmaya toplam 357 sürücü (109 kadın, 246 erkek) katılmıştır ve araştırmanın değişkenlerini ölçmek için Sürücü Davranışları Ölçeği ile birlikte Pozitif Sürücü Davranışları Ölçeği ve Kişiler Arası Problemler Envanteri katılımcılara verildi. Çalışma değişkenleri arasındaki ilişkiyi incelemek amacıyla İki Değişkenli Korelasyon ve Hiyerarşik Regresyon Analizi yapılmıştır. Ayrıca, KDM’de sürücü davranışlarının konumlarını saptamak için ipsatize veri yöntemi kullanılmıştır. Sonuçlar, sürücü davranışları ve kişiler arası problemler arasındaki ilişkilerin özelliklerinin, KDM üzerindeki sürücü davranışlarının temsilleri ile uyumlu olduğunu göstermiştir. Kişiler arası

problemlerin ve sapkın / pozitif sürücü davranışları arasındaki ilişkinin açıklanması, trafik bağlamında kişilik ve kişiler arası ilişkileri araştıran literatüre kuramsal katkı sağlamaktır. Çalışmanın sonuçları, sınırlılıkları ve katkıları ayrıntılı olarak değerlendirilecek ve tartışılacaktır.

**Anahtar Kelimeler:** sürücü davranışları, kişiler arası problemler, kişiler arası döngüsel model

*To the wonderful people in my life...*

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## **CHAPTER 1**

### **INTRODUCTION**

Road traffic accidents are one of the leading causes of death and injuries in the world. According to the World Health Organization (WHO) reports 1.25 million of people die in road traffic accidents yearly and between 20 to 50 million people get injured (2015). Even those numbers were nearly unchanged since 2007 (WHO, 2015), road traffic accident is still a major issue both globally and nationally. According to General Directorate of Security Affairs of Turkey (GDSA) data, since the beginning of 2017 until the end of May total 155.680 traffic accidents happened, 1.170 people had died in those accidents and 104.620 people had been injured (2017). When a fault happens in roads the results are inevitable and bitter, even the fault is very minor.

So, traffic is a huge part of human life and health. Even it seems a hazardous context for humans; traffic is also a social context. Humans are fairly social beings and they have the most complex and diverse interpersonal relationships. Although humans are required to cooperate with each other in order to maintain their lives, a very important part of the distress that they experience is resulted from the problems in their interpersonal relationships (Çabuk, 2015). Since they are interacting actively with other people in their lives, they are actively interacting with others on the road too; and their problems that they experience when they interact with other people are reflected on their behaviors in traffic.

#### *1.1. Human Factors in Driving*

Humans take part in traffic as drivers, pedestrians and passengers. Thus, human factors in driving can be examined under two dimensions: driver behaviors and skills. According to Elander, West and French (1993), driver behaviors could be identified as the ways drivers choose to (habitually) drive, for instance, the choice of

driving speed, habitual level of general attentiveness, and gap acceptance. In a simple way it meant what drivers usually “do” in traffic environment. On the other hand, driver skills’ definition was composed of information processing and perceptual motor and safety skills, that enhances with driving experience such as practice and training (Elander et al., 1993). In other words it meant what drivers “can do” in traffic environment. The perceptual motor skills were identified by the composition of information processing and motor skills, and safety skills are identified by the composition of motivational and permanent personality characteristics and attitudes toward safety (Lajunen, & Summala, 1995).

However, when the research was investigated it could be seen that most of the road traffic accidents were caused by drivers’ behaviors (GDSA, 2017). Therefore, the significant role and effect of human behaviors on traffic environments was undeniable. Accordingly, in this study the focus was on driver behaviors rather than driver skills; so, in the following parts driver behaviors were explained in detail.

### *1.2. Driver Behaviors: Errors and Violations*

In the literature human factors were studied through different models. Several models have been developed to clearly explain human behaviors, Reason and his colleagues’ model (1990) could be a milestone in driver behavior research and studies.

Based on Reason’s model the driver behaviors could be differentiated into two main types of aberrant behaviors at traffic settings: “violations” and “errors” (1990). In the study, errors were defined as “the failure of planned actions to achieve their intended consequences” and violations were defined as “deliberate deviations from those practices believed necessary to maintain the safe operation of a potentially hazardous system” (Reason et al., 1990). Therefore, even both violations and errors might have a potential danger and lead to crashes; violations were deliberate actions compared to errors. In addition, there were different types of errors which are failures of attention and memory: slips and lapses. According to Reason’s explanation for slips, even there was an intention the actions that were caused by this intention do not go as planned; for lapses, because of memory and/or attention failure

the driver misses an action; and for errors, even the action went as planned, it did not end up with the desired outcome (1990). Violations, on the other hand, were deliberate actions in traffic environment. So, in order to label a behavior in traffic as violation it should include an intention. However, there should be a clear distinction between errors and violations according to Reason and his colleagues (1990). As indicated in the study they both can be and sometimes they are there within the same action sequence (Reason et al., 1990). Yet, a driver can make an error without a violation and commit a violation without an error. The question that was raised by this unclear distinction can be solved by the answers of intentionality, both with regard to the actions and their consequences (Reason et al., 1990).

All those differentiations between the categories that mentioned above created a base for the development of the Manchester Driver Behavior Questionnaire (the DBQ; Reason et al., 1990). With the DBQ's self-report measurement style it was generally used for measuring driver behaviors in traffic context and its focus was on understanding and differentiating aberrant behaviors of drivers. Moreover, in the DBQ it was indicated that driver errors, violations, and slips and lapses were three factor structures of driver behaviors. However, at first in the study errors and violations were introduced as two main factors of the DBQ's factor structure (Reason et al., 1990). Driver errors and violations attracted attentions because they were the most potential contributors to the road traffic accidents. So, violations and errors could be characterized as the two critique aberrant behaviors. Moreover, Reason and his friends introduced "slips and lapses" as the third factor of the DBQ because errors had different underlying mechanisms (1990). And finally, Lawton, Parker, Manstead, & Stradling (1997) added new items to the DBQ's violation subscale and divided the violations factor into two: ordinary violations and aggressive violations. This new addition was needed because there should be a distinction based on drivers' reason to violate. According to this distinction, ordinary violations are committing a violation without any aggressive intention and aggressive violations include obvious aggressive actions (Lawton et al., 1997).

As speaking of violations, there was another concept about violations: interpersonal violations. Mesken, Lajunen and Summala (2002) indicated the concept

of ‘interpersonal violations’. ‘Interpersonal’ type of violation is closely related to ‘aggressive’ violations; however, there was a difference caused by different motives under them (Mesken, et al., 2002). Interpersonal violations seemed to be resulted from not respecting to other road users’ rights and having a potential for causing physical or psychological harm to others (Mesken, et al., 2002). More men than women drivers and younger drivers than older drivers reported to commit interpersonal violations in the study (Mesken, et al., 2002). Moreover, it was possible to say that in interpersonal violations there was more driving anger involved than in speeding violations (Mesken, et al., 2002). Furthermore, the more drivers reported interpersonal violations; the more they got engaged in passive accidents; also, those drivers reported that they have involved in an accident but they put the blame on the other driver (Mesken, et al., 2002). Thus, drivers who admitted more errors were seem to take the responsibility of the accident but those who admit interpersonal violations were seem to blame others (Mesken, et al., 2002). And lastly, the research results indicated that, interpersonal violations predicted getting traffic fine such as speeding fines or parking fines (Mesken, et al., 2002). In the literature there were many different studies that investigate the factor structure of DBQ however, the original factor structure presented by Reason et al. (1990) the errors and violations distinction appeared to be the most stable one. Even there were different factor structures shown (two to six) and/or different item numbers (24 to 114), the errors and violations were found unchanged factors of DBQ by a three-year follow-up research done in Finland (Özkan, Lajunen, & Summala, 2006). In Turkey, the DBQ is used by its four factor structure as errors, slips & lapses, ordinary violations and aggressive violations (Lajunen & Özkan, 2004) and the DBQ was adapted to Turkish by Lajunen, Sümer, and Özkan (2003).

#### *1.2.1. Positive Driver Behaviors*

There were many ways to differentiate violations and errors from each other but they both have a similarity in common: they both were labeled as aberrant therefore negative behaviors (Özkan & Lajunen, 2005). Even focusing on negative behaviors was well justified in terms of traffic safety interventions, there were some other behaviors than aberrant behaviors in everyday driving (Özkan & Lajunen,

2005). These behaviors may or may not depend on rules and regulations and consider safety. The most important motivation in those behaviors was being careful about the traffic environment or other road users and to help and be polite with or without safety concerns (Özkan & Lajunen, 2005). Those kinds of behaviors could be named as “Positive Driver Behaviors”. It could be thought that those ‘positive’ behaviors could be done by not showing a violation or an error if the action was good enough for reaching the wanted outcome. However, those ‘positive’ behaviors could include errors or violations sometimes because these mentioned requirements were not fulfilled (Özkan & Lajunen, 2005). In order to give an example; a driver may cross the barrier line in order to avoid a puddle that might splash water on pedestrians. In worst scenario this action may lead to an accident even if it was a ‘positive’ and small action with a good intent. Because such behaviors were fully included in everyday traffic context and the drivers’ intentions are not to violate the rules but ease the driving, a reliable scale for measuring “‘positive’” driver behaviors was developed by Özkan and Lajunen (2005).

### *1.3.Factors Related to Driver Behavior*

In the literature, there were many studies evidencing the relationship between driver behaviors and some individual factors like age (e.g. Constantinou et al., 2011; Özkan & Lajunen, 2006; Elvik, 2010; Rhodes & Pivik, 2011), sex (Rhodes & Pivik, 2011; Constantinou et al., 2011; Lonczak, Neighbors & Donovan, 2007), some personality characteristics (Schwebel et al., 2006; Rimmö & Aberg, 1999; Dahlen et al., 2005) and some psychological pathologies (Reimer et al., 2005; Olstedal & Rundmo, 2006). In the following part of this study, critical variables in relation to driving behaviors within the content of this study were presented.

#### *1.3.1. Age*

Age was a strong predictor of safe or risky driving. In the literature, different studies reported that being young was the riskiest factor for road traffic accidents among other age groups and an excessive percentage of fatalities and injuries in road traffic accidents around the world were constituted by young, novice drivers (e.g. Constantinou et al., 2011; Özkan & Lajunen, 2006; Elvik, 2010). For example,

Rhodes and Pivik (2011) stated that the drivers aged between 16 to 20 years old engaged in more hazardous driver behaviors related to accidents on the road as compared to the drivers aged between 25 to 45 years old. Also, Reason et al. (1990) supported this argument by stating that when considering the young drivers, risky and aggressive driving might be the most influential human factor that places them at risk (as stated in Constantinou et al., 2011). However, another research showed that age was positively correlated with reported lapses, which means that there was a decline in cognitive capacities related to age (Westerman & Haigney, 2000). Also, people reported the usage of seat-belt and observing the speed limit all the time increased with age (Shinar, Schechtman & Compton, 2001). In other words, young drivers carried the risk of accidents by driving dangerously but old drivers carried the same risk by losing their cognitive abilities.

### *1.3.2. Sex*

Sex was also related to driving behaviors, such as violations, errors, and positive driving behaviors. For example, male drivers were generally more likely to enjoy risky behaviors and consider them less risky than female drivers (Rhodes & Pivik, 2011). Also another study showed that men had higher scores on ordinary and aggressive violations, however, men and women had no difference on self-reported mistakes scores (Constantinou et al., 2011). Moreover, men stated having more accidents and traffic offences than women and admitting more intentional violations on the DBQ (Constantinou et al., 2011). In accordance with the previous study, male drivers were reported involving in more accidents, getting more traffic tickets and more violations than female drivers (González-Iglesias, Gómez-Fraguela, & Luengo-Martín, 2012). Additionally, Lonczak, Neighbors & Donovan's (2007) study agreed the majority of research indicating that men tend to engage in traffic violations and experience injuries or fatalities on traffic more than women. And lastly, women generally acted in accordance with the obligation to obey the traffic laws, while men were reported to obey more selectively such laws (Lonczak, Neighbors & Donovan, 2007).

### *1.3.3. Exposure*

Özkan & Lajunen (2006) defined exposure as “the degree to which a driver exposes himself to traffic and to the probability of being involved in an accident”. There were many different studies about exposure to traffic. One study stated that, novice drivers’ violation and crash rates dramatically decreased after one year and following years (Chapman, Masten, & Browning, 2014). Also, as drivers’ age increased their crash risk decreased according to their driving experience that they acquired in their practices (Roman et al., 2015). However, there were other studies that indicated the positive correlation between exposure and traffic accidents (Özkan et al., 2006) and other studies that reported accident involvement increased with exposure (Poulter et al., 2008; Rodríguez et al., 2003). Moreover, it was indicated that frequency of dangerous violations was also associated to exposure (Reason et al., 1990). In addition, engaging in violation and getting traffic fines were positively correlated with exposure (Lourens, Vissers, & Jessurun, 1999). Lastly, exposure was explained and studied as annual mileage in this study.

### *1.3.4. Personality Related Factors*

Research showed that, driving behavior may be indirectly related to personality. Olteidal and Rundmo (2006) indicated that risky driving was influenced by personality and this situation affected the behavior’s attitudinal factors. For example, there was a relationship between personality and risky driving behavior, which was sensation-seeking, conscientious, and angry/hostile behavior patterns were found to be positively related risky driving (Schwebel, Severson, Ball & Rizzo, 2006). On another research it was found that violations were related to high sensation seeking (Rimmö & Aberg, 1999). Moreover, while thrill-seeking was associated with speeding, disinhibition personality trait was in association with carelessness offences (Rimmö & Aberg, 1999). So in addition, when violations were in a relationship with sensation-seeking variables, errors were in a relationship with disinhibition variable (Rimmö & Aberg, 1999). Moreover, Olteidal & Rundmo’s study (2006) indicated that the association between anxiety and driving behavior had moderate effect which meant that if a driver had an average or controllable level of anxiety, their driver

behavior would not be affected in any important way. But if the level was very high or very low, then anxiety might still be related to risky driving (Olteidal & Rundmo, 2006). In addition, driving anger trait was associated with driving behavior regardless of gender and age (Dahlen & White, 2006). Also, some aberrant driver behaviors such as risky driving, aggressive driving, and minor losses of vehicular control were predicted by driving anger (Dahlen & White, 2006). So, individual differences in the tendency to experience anger while driving were strong predictors of driving behavior and accident-related outcomes (Dahlen & White, 2006). In another study it was found that impulsiveness and boredom proneness predicted crash-related situations, aggressive driving and driver anger expression (Dahlen, Martin, Ragan & Kuhlman, 2005). Violations, risky driving and anger expression were successfully predicted by impulsiveness; close calls are successfully predicted by external boredom proneness; and constructive/adaptive anger expression was successfully predicted by internal boredom proneness (Dahlen et al., 2005). According to the study of Reimer et al. (2005), Attention Deficit Hyperactivity Disorder (ADHD) was found to be related to increased number of hazardous driving situations and accident risk. Moreover, in the same study it was found that having ADHD was in a positive and significant relationship with errors, lapses and violations (Reimer et al., 2005).

It was evidenced that driving behavior was affected by different individual related variables. As emphasized before, humans are social creatures and their all behaviors are influenced by their social relationships in addition to the individual related variables. In those interpersonal relationships people have various attitudes, beliefs, problems and behaviors. So, in the following sections interpersonal behaviors and its special structural method for examination and interpretation were explained in detail.

#### *1.4. Interpersonal Behavior*

The interpersonal behavior could be defined as “to obtain categories of increasing generality that permit description of behaviors according to their natural relationships” (Pincus & Ansell, 2003). Thus, in order to understand interpersonal

behavior clearly, explanation of ‘interpersonal situation’ should be clarified. It could be indicated as “the expression of personality (and hence the investigation of its nature) focuses on phenomena involving more than one person—that is to say, *some form of relating is occurring* (Benjamin, 1984; Kiesler, 1996; Mullahy, 1952 as cited in Pincus & Ansell, 2003). Moreover, according to Sullivan an ‘anxiety gradient’ which was related to interpersonal situations created a base for interpersonal learning of social behaviors (Pincus & Ansell, 2003). Also, the range of all interpersonal situations went from rewarding (highly secure) through different levels of anxiety and finishes in a set of situations related with such severe anxiety that they were separated from experience (Pincus & Ansell, 2003). According to Sullivan there were three different possible outcomes for interpersonal situations: security, negotiation and frustration (Pincus & Ansell, 2003). The primary ideas of an interpersonal theory should be including a description of the meaning of ‘interpersonal’ and a systematic definition of interpersonal behavior (Pincus & Ansell, 2003). And specifically, according to the writers this definition brought a view of the people’s reciprocal behavior patterns, for example, resolving, negotiating or disintegrating their interpersonal situations (Pincus & Ansell, 2003).

As Foa (1961) indicated, it was claimed that an interpersonal behavior was an attempt to build an emotional relationship of a person towards themselves and towards the others, at the same time build a social association of the self and the other concerning a larger reference group. According to Horowitz et al. (2006), interpersonal behaviors were motivated behaviors. For example, when a person started an interaction with another person, it was assumed that this behavior was goal-directed. However, it was not always necessary for the person to be conscious about that goal and that goal’s importance may vary from trivial to vital (Horowitz et al., 2006). At the same time, if the motive of an interpersonal behavior was not clear enough, the result of the behavior was ambiguous (Horowitz et al., 2006). Moreover, people’s expectations about others’ motives influenced the interpersonal interaction (Horowitz et al., 2006). Interpersonal behaviors were not only influenced by motives or goals, but also affect. Forgas (2002) indicated in the study that ‘figuring out how people’s interpersonal strategies were influenced by affect’ was one of the most

important points in psychology. People's abilities for planning effectively and using complex interpersonal strategies were essential; also, the big part of affect in these processes was still not understood enough (Forgas, 2002). There was enough evidence to take it seriously that affect had a huge and complex influence on the content and the process of people's methods of planning and executing their strategic interpersonal behaviors (Forgas, 2002). Furthermore, people's constructive interpretations of social situations and their next interpersonal behaviors were undeniably influenced by affect (Forgas, 2002). Besides motive and affect, the interpersonal behaviors were influenced by expectancies between people. According to Jones (1986), for social adaptation interpersonal expectancies were necessary. People's previous experiences with others were reflected by their expectancies and people got prepared for the most possible occasions of their future by their expectancies (Jones, 1986). So, by doing all of these, expectancies helped people to establish interpersonal behaviors of themselves.

As speaking of interpersonal behaviors, there are different types of them and they are examined under special constructions. Circumplex model was one of the methods that examine those behaviors and information about the interpersonal circumplex was given in following sections in detail.

### *1.5. Interpersonal Circumplex*

Cataloging individuals' interpersonal behaviors opened the way for an empirically produced circular structure (Pincus & Ansell, 2003). Sullivan's theory about interpersonal relations mentions the facts of security and self-esteem which were the most important motivations under interpersonal interactions. So, Leary (1957) evaluated Sullivan's theory and developed a circle of interpersonal behavior (as cited in Akyunus, 2012). That circular space was named as 'circumplex' and that space was consisted of two dimensions. Leary described those two dimensions according to Sullivan's security and self-esteem concepts and created the coordinates of affiliation and dominance, respectively (as cited in Akyunus, 2012). According to Horowitz et al. (2006), these dimensions could be exemplified as 'connection between people' and 'one person's influence over the other', respectively. According

to this model, affiliation and dominance represented the basic coordinates on a circumplex; thus, interpersonal behavior could be explained as a combination of these coordinates (Alden et al., 1990; Horowitz et al., 2003; as cited in Akyunus & Gençöz, 2016). The dimension of affiliation on the horizontal axis varied between the hostility behaviors and friendly behaviors. At the same time, the dimension of dominance on the vertical axis varied between dominance and submission (Alden et al., 1990; Horowitz et al., 2003; as cited in Akyunus & Gençöz, 2016). In addition to the four poles (e.g. dominant, hostile, submissive and friendly) of these two axes (dominance and affiliation), when four more poles of the mentioned four poles' combinations are added, the interpersonal circumplex became separated into eight interpersonal behavior/problem areas (i.e., octants) (Alden et al., 1990; Horowitz et al., 2003; as cited in Akyunus & Gençöz, 2016). The combinations of those points were named 'Hostile-Dominant, Hostile-Submissive', Friendly-Submissive and Friendly-Dominant' respectively. The interpersonal circumplex (IPC) can be seen in Figure 1.

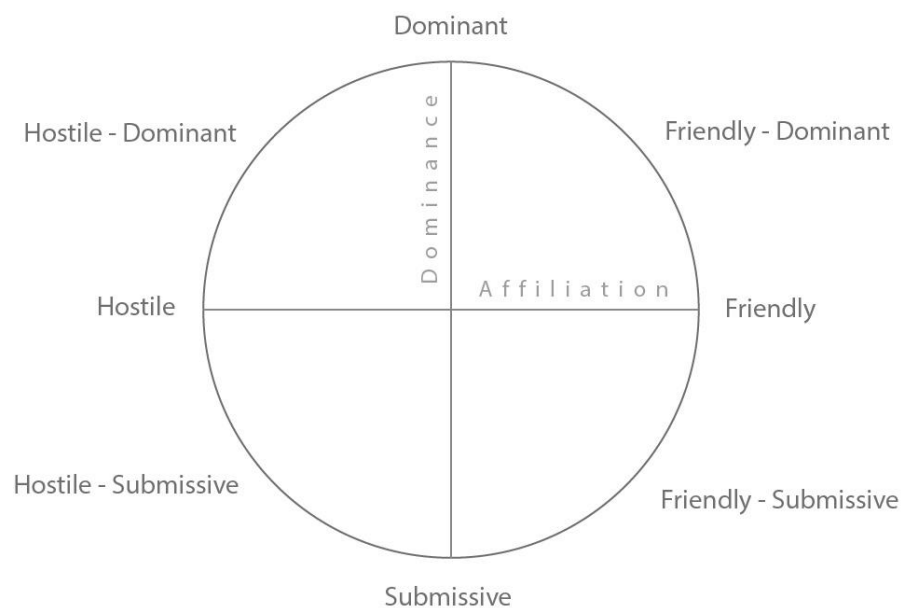


Figure 1. *Interpersonal Circumplex Model.*

Individual differences in a range of interpersonal domains could be represented geometrically by the IPC model. So, blends of the circumplex's two main dimensions could define all features of individual differences among these

domains (Pincus & Ansell, 2003). Around a 360° perimeter of the circle, those mentioned blends of affiliation and dominance could be located. On the circumplex the octants which were neighbor to each other (e.g. Friendly and friendly-dominant) are conceptually and statistically similar, octants which were at 90° (e.g. Dominant and Friendly) are conceptually and statistically independent, and octants which were 180° apart (e.g. Hostile and Friendly) are conceptual and statistical opposites (Pincus & Ansell, 2003). In sum, that circular model had no beginning or end and it was a continuum (Carson, 1969, 1996; Gurtman & Pincus, 2000; as cited in Pincus & Ansell, 2003). Even the IPC demonstrated a model that a person can be possibly located in more than one interpersonal situation, the model was monadic; which meant that the IPC model components do not include interaction among each other (Pincus & Ansell, 2003). Studies in the context of interpersonal circumplex models provided interpersonal diagnosis and conceptual mapping in psychotherapies, unlike other interpersonal inventory studies (Akyunus & Gençöz, 2016). In this way, clinicians can position the patient's interpersonal behavior pattern on the circumplex model and determine the area of the patient's prominent interpersonal dissonance (Akyunus & Gençöz, 2016).

In order to measure various types of difficulties in interpersonal functionality that individuals experience, the inventory named as “The Inventory of Interpersonal Problems (IIP)” was developed (Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988). Detecting various interpersonal problems’ severity and frequency, spotting the general interpersonal problems, sorting out interpersonal problems which were related to stress and psychotherapeutical processes constitutes IIP-C’s clinical use areas (Akyunus & Gençöz, 2016). With respect to the eight divisions of IPC, the IIP includes eight subscales. However, in the inventory the names of the octants were changed in the IIP subscales. The subscale corresponding to the ‘Dominant’ octant was named ‘Domineering-Controlling’; other subscale corresponding to the ‘Hostile’ octant was named ‘Cold-Distant’, other subscale corresponding to the ‘Submissive’ octant was named ‘Nonassertive’ and other subscale corresponding to the ‘Friendly’ octant was named ‘Self-Sacrificing’. Furthermore, considering the combinations of those octants one subscale corresponding to the ‘Hostile-Dominant’ octant was

named 'Vindictive-Self-centered', the subscale corresponding to the 'Hostile-Submissive' octant was named 'Socially Inhibited', the subscale corresponding to the 'Friendly-Submissive' octant was named 'Overly Accommodating' and lastly the subscale corresponding to the 'Friendly-Dominant' octant was named 'Intrusive-Needy'. According to Akyunus (2012), the octants of the IPC can be explained as in following: 'Domineering-Controlling Subscale' was described as the having difficulty in giving up the control, person's level of being controlling or manipulative, intolerance for losing control, not being able to see others' viewpoints and propensity to having arguments with others. 'Vindictive-Self Centered Subscale' was described as having hostile dominance problems, anger and irritability expressions and experiences, suspecting and not trusting others, disregarding and not supporting other people's needs and welfare, and being irresponsible. 'Cold-Distant Subscale' was described as minimum level of feelings of affection and bonding with others, having hard times in continuing long-term commitments, and not having sympathy, nurturance, warmth and generosity to others. 'Socially Inhibited Subscale' was described as feeling anxious, timid and embarrassed with other people around, inability to starting social interactions, joining in groups, socializing and showing feelings. 'Nonassertive Subscale' was described as having seriously low levels of self-confidence and self-esteem, inability to take initiative and be center of attention, avoiding from socially challenging situations and from making wishes because of fearing from disapproval and negative evaluation. 'Overly Accommodating Subscale' was described as not being offensive about pleasing others and gain their approval, inability to say 'no' to others, lack of feeling and expressing anger, being easy to convince and deceive, avoiding from assertiveness because of fearing inability to maintain relationships. 'Self-Sacrificing Subscale' was described as having overly enthusiastic levels of serving and giving to others, being overly generous, caring, trusting and permissive for others, and inability to keeping boundaries in relationships with others, being too protective of others, and difficulty to put their own needs before others'. 'Intrusive-Needy Subscale' was described as being in a need for engagement with others, inability to spend their time alone, self-disclosing inappropriately and having poor interpersonal boundaries. This inventory was studied before with different variables such as: with personality disorders (Alden

& Capreol, 1993; Stern, Kim, Trull, Scarpa, & Pilkonis, 2000; Lejuez et al., 2003) and in clinical therapeutic use (Muran, Segal, Samstag, & Crawford, 1994; Borkovec, Newman, Pincus, & Lytle, 2002; Hansen & Lambert, 1996). However, the Inventory of Interpersonal Problems was never studied with driver behaviors and in the current study this was achieved.

### *1.6. The Relationship between Driver Behaviors and Interpersonal Problems*

In the literature there were many studies evidencing the relationship between driver behaviors and different individual related characteristics. Although these studies showed that in the literature, driver behaviors had been studied in many problematic situations, but they had not been studied directly with interpersonal relationships. When drivers can be negatively or positively affected by traffic-related stimuli, they also transfer their emotions, stress, or anxiety from daily life to traffic environment. Driving behaviors can be affected by not only driving situations but also unresolved “nondriving” problems. The traffic environment is an environment that involves a lot of interpersonal interaction. Drivers are not alone in traffic so; even if there is no verbal interaction as in many other interactive life settings, the expressions and attitudes are reflected in the behaviors on the roads, and interaction in traffic environment is established between people through behaviors. Of course, this interaction is not always positive or pleasant. The problems that people (drivers) have in interpersonal relationships are reflected in the way they express themselves through their behavior.

### *1.7. Aim of the Study*

The present study had two main purposes: The first one was to examine the relationship between driver behaviors and interpersonal problems; and the second one was representing different driver behaviors on the Interpersonal Circumplex space. By this way, those two concepts would be studied in relation to each other, for the first time in the literature.

## CHAPTER 2

### METHOD

#### *2.1. Participants*

The sample of the study was consisted of 357 Turkish adults who had valid driver's licenses and drive in traffic regularly. The participants were from different cities in Turkey, mainly from Ankara and Balıkesir. The females represented 30.5% (N = 109) and males represented 69.3% (N = 246) of the sample. The ages of the participants ranged from 18 to 70 ( $M_{\text{age}} = 36.46$ ,  $SD = 13.38$ ). Considering the education levels of the participants; two participants (0.6% of the sample) were graduated from primary school, six participants (1.7% of the sample) were graduated from middle school, 38 participants (10.6% of the sample) were graduated from high school, 47 participants (13.2% of the sample) were graduated from junior college, 210 participants (58.8% of the sample) were graduated from university and 52 participants (14.6% of the sample) were post-graduates. All participants obtained driving licenses at least a year and the range of this duration was between 1 and 47 ( $M = 14.64$ ,  $SD = 11.02$ ). Moreover, the range of the annual mileage was between 0 and 560000 ( $M = 15194.50$ ,  $SD = 35608.68$ ) and total mileage was between 0 and 7000000 ( $M = 213746.14$ ,  $SD = 569538.43$ ). The demographics of the participants were given in Table 1 and Table 2.

Table 1. *Descriptive statistics of participants in the study.*

	N	Minimum	Maximum	Mean	Std. Deviation
Age	355	18	70	36.46	13.38
Duration of having a valid driver's license (in years)	355	1	47	14.64	11.02
Total distance in km	340	0	7000000	21374 6.14	569538.43
Annual distance in km	349	0	560000	15194 .50	35608.68
Number of active accidents	352	0	5	.80	1.08
Number of passive accidents	352	0	5	.51	.98

Table 2. *Frequency Table of Types of Tickets.*

Type of Ticket	N (valid)	Frequency
Erroneous Parking	355	136
Erroneous Overtaking	355	87
Over-Speeding	355	164
Red Light Violation	355	99
Other	355	96
No Ticket	355	181

*Note: Frequency means that the number of people received tickets.*

## 2.2. Procedure

Before data collection started the ethical approval was obtained from Middle East Technical University Human Subjects Ethics Committee. The participants were invited to the study via e-mails and social media announcements, using the snowball sampling method. The materials were uploaded to the online survey software (Qualtrics) and also paper copies of the material were printed. Some participants completed the study online and to some participants, for whom online system was not available paper-pencil version of it was distributed. When the procedure began,

participants were given an informed consent form and they were expected to give their consent to participate the study voluntarily (See Appendix B). The participants were informed about anonymity and confidentiality. After that, they completed the demographic questions which included age, gender, education, annual mileage, number of traffic tickets and accidents (See Appendix C). No personal information was asked. When these steps completed, the questionnaires started and all participants were expected to answer all of the questions.

### *2.3. Instruments*

#### *2.3.1 Demographic Information Form*

Before the questionnaires were administered to the participants a demographic information form was given in order to collect the relevant data. In this form there were no questions about personal information. The participants were asked about their age, gender, education level, duration of having a valid driver's license (in years), total and annual mileage in kilometers, and number of traffic tickets and accidents.

#### *2.3.2. Inventory of Interpersonal Problems- Circumplex (IIP-C)*

The "Inventory of Interpersonal Problems (IIP) was developed in order to explain people's challenging experiences in their interpersonal relationships (Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988). In its original version, the IIP was a 127 items scale which was developed with the contribution of psychotherapy seeking people's interpersonal complaints. Horowitz, Alden, Wiggins and Pincus (2003) constructed the short version of this inventory (IIP-32) and the scale's psychometric structure is preserved.

IIP-32 is a 5-point Likert type scale in which participants evaluated their attitudes (1= Not at all, 5= Almost). It also is a 32 item self-report measure including eight subscales and all subscales have four items separately. The subscales were named as Domineering-Controlling, Cold-Distant, Nonassertive, Self-Sacrificing, Vindictive-Self-centered, Socially Inhibited, Overly Accommodating, Intrusive-Needy. The overall internal consistency reliability score of the IIP in the current

study was .87. Moreover, the reliability scores of the subscales were given as: domineering-controlling .65, vindictive-self-centered .70, cold-distant .70, socially inhibited .80, nonassertive .63, overly accommodating .56, self-sacrificing .74 and intrusive-needy .08. Each subscale was illustrated in the following Figure 2 by items from the IIP.

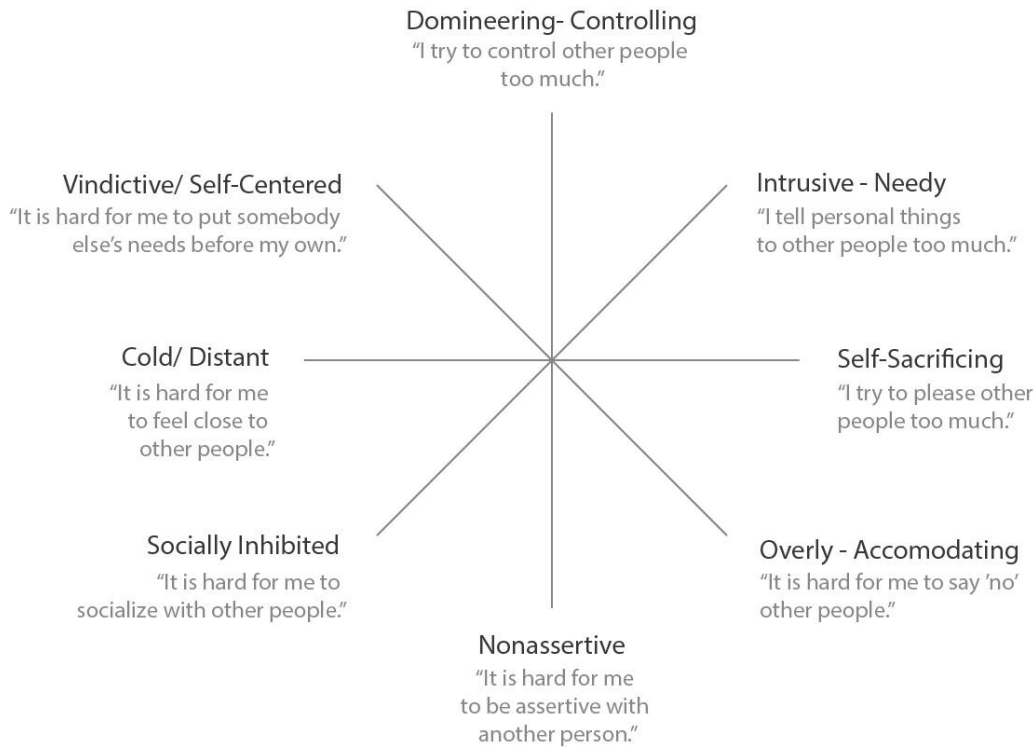


Figure 2. *Illustrative items of each subscales of IIP-C.*

### 2.3.3. Driver Behavior Questionnaire (DBQ)

The Manchester Driver Behavior Questionnaire (DBQ) was developed in order to identify and measure aberrant driver behaviors on traffic by Reason and colleagues in 1990. Lawton et al. (1997) extended the scale with the distinction of aggressive and ordinary violations and it was adapted to Turkish by Lajunen and Özkan (2004). So, DBQ has four subscales as errors, slips and lapses, ordinary violations and aggressive violations. In 2005, Özkan and Lajunen conducted a research and added "Positive Driver Behaviors Scale" to DBQ.

DBQ is a 6-point Likert type scale which participants rate their behavior frequencies (1=Never, 6=Always). It also is a 37 item self-report measure including five subscales. There are eight items in slips and lapses subscale, eight items in errors subscale, nine items in ordinary violations subscale, three items in aggressive violations subscale and nine items in positive driver behaviors subscale. The DBQ was given to participant in order to measure the aberrant driver behaviors and the Positive Driver Behaviors scale was given with it in order to measure positive behaviors. The DBQ's overall internal consistency reliability score was .76 in the current study. And the reliability scores of subscales of DBQ for slips and lapses was .57, for errors was .47, for aggressive violations was .65, and for ordinary violations .76. Moreover, for positive driver behavior scale the reliability score was .80. The subscales of the DBQ and Positive Driver Behaviors scale were illustrated in the following Table 3.

Table 3. *The Examples of Driver Behavior Questionnaire Items and Positive Driver Behavior Items*

The type of behavior	Example
Slips	In a queue of vehicles turning left on to a main road, pay such close attention to the traffic approaching from the right that you nearly hit the car in front.
Lapses	Attempt to drive away from traffic lights in third gear.
Errors	Overtake a single line of stationary or slow-moving vehicles, only to discover that they were queueing to get through a one-lane gap or roadwork lights.
Aggressive Violations	Give chase with the intention of giving him or her a piece of your mind.
Ordinary Violations	Staying in a motorway lane that you know will be closed ahead until the last minute before forcing your way into the other lane.
Positive Driver Behaviors	Following the driver of the vehicle ahead, at a distance that will not disturb him or her.

## CHAPTER 3

### RESULT

#### *3.1. Analysis Method*

In this study, all the computations were made by IBM SPSS Statistics V.20 program. The scores of subscales and constructs of the instruments were computed by averaging the scores of the items that belonged to each factor. Also, the reliability scores of all instruments and their subscales were computed. In the first step, descriptive statistical values of the variables used in the study were computed. After that, the bivariate correlation analyses were conducted to see the basic relationships between the variables. And then, hierarchical regression analyses were done in order to investigate the relationships between the DBQ, positive driver behaviors scale and IIP and their subscales. In the following sections those processes were presented in detail.

In order to observe the representations of driver behaviors on the interpersonal circumplex model, similar statistical procedures were performed in accordance with the previous studies with the DBQ, positive driver behaviors scale and IIP (Locke, 2010; Akyunus & Gençöz, 2016). This section described the analytic procedure of ipsatize data and finding the positions of driver behaviors on IPC space and how to do it. And the procedure was given step by step:

- Translating raw data to ipsatized data: In order to obtain the bipolar dimensions of affiliation and dominance of the interpersonal circumplex, raw data was translated into ipsatized data (Locke, 2010). For finding the ipsatized data, firstly, the raw scale scores for each octant of the IIP were computed. The raw score meant the mean scores of every subscale of IIP for every participant. And then, subtracting overall mean of the scale from each scale score gave us the ipsatized data (Locke, 2010).

- Detecting the participants' positions on affiliation and dominance dimensions: In order to accomplish that Locke's (2010) formulation was used to obtain the agentic, unagentic, communal and uncommunal dispositions.
- The formulation:

Agentic Vector=  $(0.414)(PA + (0.707)(BC + NO))$

Unagentic Vector=  $(0.414)(HI + (0.707)(FG + JK))$

Communal Vector=  $(0.414)(LM + (0.707)(JK + NO))$

Uncommunal Vector=  $(0.414)(DE + (0.707)(BC + FG))$

- Finding X and Y coordinate values: By subtracting unagentic vector score from agentic vector score, Y (vertical) coordinate value can be obtained. By subtracting uncommunal vector score from communal vector score X (horizontal) coordinate value can be obtained. These X and Y coordinates defined a vector sum in the IPC space.
- Plotting the positions: And lastly, in order to plot the positions of driver behaviors on IPC space a correlation should be computed. The scores that can be obtained after correlating DBQ's subscale scores with X and Y coordinate values of IIP, gave the coordinate values of driver behaviors on IPC space (Locke, 2010; Akyunus & Gençöz, 2016).

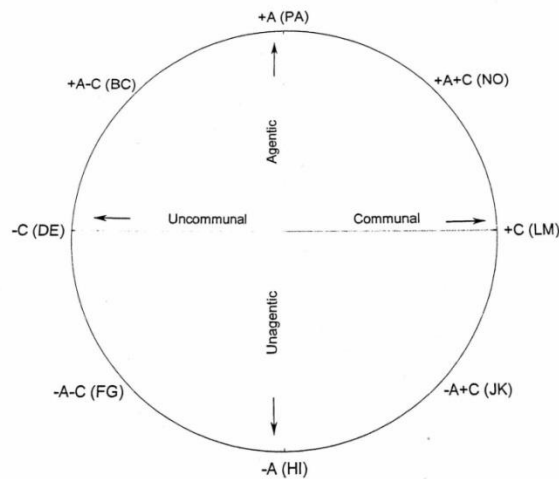


Figure 3. *The interpersonal circumplex illustration for the analytic procedure of ipsatized data*

### 3.2. Descriptive Statistics

The study's variables, which were DBQ's four subscales, positive driver behavior scale and IIP's eight subscales, were evaluated in Table 4 and descriptive statistics values were reported.

Table 4. *Descriptive Statistics of Variables*

Variables	N	Mean	SD	Min	Max	Range
Lapses	357	1.61	.41	1.00	3.13	2.13
Errors	357	1.58	.44	1.00	3.50	2.50
Aggressive Violations	357	2.05	.79	1.00	5.67	4.67
Ordinary Violations	357	1.81	.60	1.00	4.56	3.56
Positive Behavior	357	4.58	1.00	1.11	6.00	4.89
Dominant	357	1.95	.71	1.00	4.75	3.75
Hostile-Dominant	357	1.99	.74	1.00	4.25	3.25
Hostile	357	2.01	.77	1.00	4.25	3.25
Hostile-Submissive	357	1.99	.82	1.00	5.00	4.00
Submissive	357	2.33	.78	1.00	4.50	3.50
Friendly-Submissive	357	2.37	.73	1.00	5.00	4.00
Friendly	357	2.72	.85	1.00	5.00	4.00
Friendly-Dominant	357	2.39	.74	1.00	5.00	4.00

When the table was evaluated it can be seen that participants rated positive driver behaviors ( $M=4.58$ ,  $SD= 1.00$ ) higher than any other driver behavior categories. Moreover, concerning the aberrant driver behaviors, participants rated themselves highest in aggressive violations category ( $M= 2.05$ ,  $SD= .79$ ). Furthermore, when IIP values were examined it can be said that all subscales were rated similarly by participants according to the mean scores of IIP. However, the friendly octant of the IIP was rated highest ( $M= 2.72$ ,  $SD= .85$ ) compared to other seven octants and the dominance octant was rated lowest ( $M= 1.95$ ,  $SD= .71$ ).

### *3.3. The Relationship between Driver Behaviors and Interpersonal Problems*

#### *3.3.1. Bivariate Correlation Analyses*

A bivariate correlation analysis was conducted in order to see the relationship between demographic variables and DBQ subscales. The correlation results are given in Table 5. Some of the significant relationships are indicated in the following.

When the relationship between some demographic variables and DBQ variables were examined it can be seen that there was a negative relationship between age and lapses ( $r = -.25, p < .01$ ), aggressive violations ( $r = -.18, p < .01$ ), and ordinary violations ( $r = -.31, p < .01$ ). This meant, as age increased, frequency of engaging in lapses, aggressive violations and ordinary violations decreased. Moreover, as a participant's duration of having a driver license got longer, their number of having active accidents ( $r = -.22, p < .01$ ), lapses ( $r = -.24, p < .01$ ), and aggressive violations ( $r = -.15, p < .01$ ) got lower. And finally, there was a positive relationship between the number of active accidents and lapses ( $r = .23, p < .01$ ), aggressive violations ( $r = .14, p < .01$ ) and ordinary violations ( $r = .16, p < .01$ ). Also, there was a positive relationship between passive accidents and aggressive violations ( $r = .14, p < .01$ ) and ordinary violations ( $r = .16, p < .01$ ). These all meant that, as a driver's frequency of engaging in an active or passive accident increased, that driver's frequency of engaging in aggressive and ordinary violations increased as well.

Table 5. Correlations of demographic variables and DBQ

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	1										
2. License	.938**	1									
3. Ann. Km.	.062	.090	1								
4. Tot. Km.	.300**	.348**	.611**	1							
5. Act. Accd.	-.222**	-.226**	-.047	-.089	1						
6. Psv. Accd.	-.121*	-.096	.117*	-.002	.271**	1					
7. Lapses	-.257**	-.245**	-.119*	-.070	.230**	.096	1				
8. Errors	-.013	-.026	-.030	.022	.099	.044	.408**	1			
9. Agg. Vio.	-.186**	-.152**	-.070	.020	.145**	.134*	.204**	.285**	1		
10. Ord. Vio.	-.313**	-.243	-.047	-.093	.168**	.183**	.364**	.341**	.470**	1	
11. Pos. Beh.	-.052	-.038	.033	.022	-.032	.043	.023	-.040	-.059	.058	1

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

Note: Ann. Km. = Annual mileage, Tot. Km. = Total Mileage, Act. Accd. = Active Accidents, Psv. Accd. = Passive Accidents, Agg. Vio. = Aggressive Violations, Ord. Vio. = Ordinary Violations, Pos. Beh. = Positive Driver Behaviors

In addition, another bivariate correlation analysis was conducted in order to see the relationship between DBQ subscales and IIP subscales. The correlation results were given in Table 6. Some of the significant relationships were indicated in the following section.

When the table was examined it can be seen that there was a positive relationship between DBQ subscales excluded positive driver behaviors; such as, there was a positive correlation between lapses and errors ( $r = .40, p < .01$ ), aggressive violations ( $r = .20, p < .01$ ) and ordinary violations ( $r = .36, p < .01$ ). Moreover, errors had positive relationship with aggressive violations ( $r = .28, p < .01$ ) and ordinary violations ( $r = .34, p < .01$ ). And finally, aggressive violations were found to be positively related with ordinary violations ( $r = .47, p < .01$ ).

Concerning the relationships between the IIP subscales, the correlation analysis showed that being dominant on IPC is positively related to being hostile-dominant ( $r = .34, p < .01$ ), being hostile ( $r = .35, p < .01$ ), being hostile-submissive ( $r = .28, p < .01$ ), being submissive ( $r = .26, p < .01$ ), being friendly-submissive ( $r = .17, p < .01$ ), being friendly ( $r = .20, p < .01$ ), and being friendly-dominant ( $r = .41, p < .01$ ). Moreover, hostile-dominant subscale of IIP had a positive relationship with being hostile ( $r = .60, p < .01$ ), being hostile-submissive ( $r = .38, p < .01$ ), being submissive ( $r = .29, p < .01$ ), and being friendly-submissive ( $r = .21, p < .01$ ). Furthermore, there was a positive relationship between being hostile on IPC and being hostile-submissive ( $r = .57, p < .01$ ), being submissive ( $r = .47, p < .01$ ), and being friendly-submissive ( $r = .29, p < .01$ ). Also, being hostile-submissive on IPC was positively related to being submissive ( $r = .59, p < .01$ ), being friendly-submissive ( $r = .43, p < .01$ ), and being friendly ( $r = .13, p < .01$ ). Moreover, a positive correlation was found between being submissive and being friendly-submissive ( $r = .67, p < .01$ ), being friendly ( $r = .35, p < .01$ ), and friendly-dominant ( $r = .33, p < .01$ ). There was also a positive relationship between being friendly-submissive and being friendly ( $r = .59, p < .01$ ) and being friendly-dominant ( $r = .34, p < .01$ ). And finally, being friendly on IPC had positive correlation with being friendly-dominant ( $r = .45, p < .01$ ).

Lastly, after examining the correlations between DBQ subscales and IIP subscales, the findings were given as following (See Table 5). The ‘lapses’ subscale

of DBQ was positively correlated with all of the subscales of IIP; such as, with being dominant ( $r = .24, p < .01$ ), being hostile-dominant ( $r = .16, p < .01$ ), being hostile ( $r = .22, p < .01$ ), being hostile-submissive ( $r = .14, p < .01$ ), being submissive ( $r = .25, p < .01$ ), being friendly-submissive ( $r = .19, p < .01$ ), being friendly ( $r = .11, p < .01$ ), and being friendly-dominant ( $r = .23, p < .01$ ). Also, 'errors' subscale of DBQ had a positive relationship with being dominant ( $r = .23, p < .01$ ), being hostile-dominant ( $r = .14, p < .01$ ), being hostile ( $r = .21, p < .01$ ), being hostile-submissive ( $r = .12, p < .01$ ), being submissive ( $r = .22, p < .01$ ), being friendly-submissive ( $r = .12, p < .01$ ), and being friendly-dominant ( $r = .10, p < .01$ ). Furthermore, there was a positive relationship between 'aggressive violations' subscale of the DBQ and being hostile ( $r = .11, p < .05$ ) and being hostile-submissive ( $r = .15, p < .01$ ). In addition, positive relationships were found between 'ordinary violations' subscale of the DBQ and being dominant ( $r = .34, p < .01$ ), being hostile-dominant ( $r = .14, p < .01$ ), being hostile ( $r = .18, p < .01$ ), being hostile-submissive ( $r = .21, p < .01$ ), being submissive ( $r = .16, p < .01$ ), being friendly-submissive ( $r = .12, p < .05$ ), and being friendly-dominant ( $r = .13, p < .05$ ). And finally positive driver behaviors were negatively correlated with some IIP subscales; such as; with being dominant ( $r = -.12, p < .05$ ), with being hostile-dominant ( $r = -.17, p < .01$ ), and being hostile ( $r = -.15, p < .01$ ).

Table 6. The Correlations of subscales of DBQ and IIP

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Lapses	1												
2. Errors	.408**	1											
3. Agg. Vio.	.204**	.285**	1										
4. Ord. Vio.	.364**	.341**	.470**	1									
5. Pos. beh.	.023	-.040	-.059	.058	1								
6. Dominant	.246**	.231**	.262**	.347**	-.122*	1							
7. Host-Dom	.166**	.142**	.070	.145**	-.176**	.344**	1						
8. Hostile	.227**	.212**	.118*	.187**	-.151**	.358**	.609**	1					
9. Host-Sub	.141**	.124**	.150**	.213**	-.077	.286**	.384**	.572**	1				
10. Submsv	.259**	.227**	.087	.164**	-.068	.262**	.298**	.479**	.594**	1			
11. Frnd-Sub	.195**	.130**	.052	.129*	-.033	.171**	.213**	.291**	.438**	.677**	1		
12. Friendly	.117**	.036	.051	.059	.080	.206**	-.086	.031	.137**	.357**	.590**	1	
13. Frnd-Dom	.236**	.106**	.098	.133*	-.028	.415**	.100	.036	.074	.330**	.348**	.458**	1

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

Note: Agg. Vio. = Aggressive Violations, Ord. Vio. = Ordinary Violations, Pos. Beh. = Positive Driver Behaviors, Host-Dom = Hostile-Dominant, Host-Sub = Hostile-Submissive, Submsv = Submissive, Frnd-Sub = Friendly-Submissive, Frnd-Dom = Friendly-Dominant

### 3.3.2. Hierarchical Regression Analyses

In the following section, the hierarchical regression analyses were used to test the relationships between driver behaviors and interpersonal problems. In order to see the accurate results, the relationships of significantly correlated variables were put into the analyses.

The first analysis was conducted in order to see the association between slips & lapses and interpersonal problems. In the analysis, slips & lapses were identified as the dependent variable (DV) and interpersonal problems were identified as the independent variables (IV). In order to control the statistical effects of age, sex, and exposure, these variables were entered in the first step of the analysis. Later, the interpersonal problems were entered at the second step as the IVs. The results of the analysis are showed in the Table 7. The results presented that controlled variables contributed significantly to regression model and accounted for 8% of variation in slips & lapses ( $F(3, 345) = 9.87, p < .05, R^2 = .08$ ). Introducing the interpersonal problems explained an additional 10% of variation in slips & lapses ( $F_{change}(8, 337) = 5.12, p < .05, R^2 = .17$ ). The only interpersonal problem that related to slips & lapses was being hostile; being hostile was found to be positively related to slips & lapses.

Table 7. *Hierarchical Regression of Slips and Lapses on the IIP Components*

Variables	$\beta$	$P$	$R^2$	$R^2_{change}$
Step 1		.000	.079	.079
Age	-.231	.000		
Sex	-.060	.271		
Annual Mileage	-.097	.065		
Step 2		.000	.179	.100
Age	-.164	.002		
Sex	-.062	.257		
Annual Mileage	-.062	.225		
Dominant	.101	.101		
Host-Dom	.006	.930		
Hostile	.146	.049		
Host-Sub	-.083	.232		
Submsv	.123	.123		
Frnd-Sub	.061	.451		
Friendly	-.027	.700		
Frnd-Dom	.118	.065		

*Note: N = 349, Host-Dom = Hostile-Dominant, Host-Sub = Hostile-Submissive,*

*Submsv = Submissive, Frnd-Sub = Friendly-Submissive, Frnd-Dom = Friendly-Dominant*

*Dependent Variable = Slips & Lapses*

The second analysis was conducted in order to see the association between errors and interpersonal problems. In the analysis, errors were identified as the DV and interpersonal problems were identified as the IV. In order to control the statistical effects of age, sex, and exposure, these variables were entered in the first step of the analysis. Later, the interpersonal problems were entered at the second step as the IVs. The results of the analysis are showed in the Table 8. The results presented that controlled variables contributed significantly to regression model and accounted for 1% of variation in errors ( $F(3, 345) = .77, p < .05, R^2 = .01$ ). Introducing the interpersonal problems explained an additional 10% of variation in errors ( $F_{change}(7, 338) = 5.58, p < .05, R^2 = .11$ ). The interpersonal problems that related to errors were being dominant ( $\beta = .18, p < .05$ ) and being submissive ( $\beta = .21, p = .05$ ).

Table 8. *Hierarchical Regression of Errors on the IIP Components*

Variables	$\beta$	$P$	$R^2$	$R^2_{change}$
Step 1		.509	.007	.007
Age	-.031	.582		
Sex	.080	.159		
Annual Mileage	-.039	.473		
Step 2		.000	.110	.103
Age	.029	.601		
Sex	.079	.158		
Annual Mileage	-.011	.832		
Dominant	.182	.004		
Host-Dom	-.028	.670		
Hostile	.149	.052		
Host-Sub	-.125	.083		
Submsv	.218	.009		
Frnd-Sub	-.011	.876		
Frnd-Dom	-.011	.862		

Note:  $N = 349$ , *Host-Dom* = *Hostile-Dominant*, *Host-Sub* = *Hostile-Submissive*,

*Submsv* = *Submissive*, *Frnd-Sub* = *Friendly-Submissive*, *Frnd-Dom* = *Friendly-Dominant*

*Dependent Variable* = *Errors*

The third analysis was conducted in order to see the association between aggressive violations and interpersonal problems. In the analysis, aggressive violations were identified as the DV and interpersonal problems were identified as the IV. In order to control the statistical effects of age, sex, and exposure, these variables were entered in the first step of the analysis. Later, the interpersonal problems were entered at the second step as the IVs. The results of the analysis are showed in the Table 9. The results presented that controlled variables contributed significantly to regression model and accounted for 3% of variation in aggressive violations ( $F(3, 345) = 4.53, p < .05, R^2 = .03$ ). Introducing the interpersonal problems explained an additional 7% of variation in aggressive violations ( $F_{change}(3, 342) = 8.46, p < .05, R^2 = .10$ ). The only interpersonal problem that related to

aggressive violations was being dominant; being dominant was found to be positively related to aggressive violations.

Table 9. *Hierarchical Regression of Aggressive Violations on the IIP Components*

Variables	$\beta$	$P$	$R^2$	$R^2_{change}$
Step 1		.004	.038	.038
Age	-.178	.001		
Sex	-.012	.835		
Annual Mileage	-.057	.284		
Step 2		.000	.104	.067
Age	-.120	.031		
Sex	-.040	.456		
Annual Mileage	-.047	.362		
Dominant	.233	.000		
Hostile	-.017	.793		
Host-Sub	.090	.152		

*Note: N = 349, Host-Sub = Hostile-Submissive, Dependent Variable = Aggressive Violations*

The fourth analysis was conducted in order to see the association between ordinary violations and interpersonal problems. In the analysis, ordinary violations were identified as the DV and interpersonal problems were identified as the IV. In order to control the statistical effects of age, sex, and exposure, these variables were entered in the first step of the analysis. Later, the interpersonal problems were entered at the second step as the IVs. The results of the analysis are showed in the Table 10. The results presented that controlled variables contributed significantly to regression model and accounted for 14% of variation in ordinary violations ( $F(3, 345) = 18.85, p < .05, R^2 = .14$ ). Introducing the interpersonal problems explained an additional 10% of variation in ordinary violations ( $F_{change}(7, 338) = 6.58, p < .05, R^2 = .24$ ). The only interpersonal problem that related to ordinary violations was being dominant; being dominant was found to be positively related to ordinary violations.

Table 10. *Hierarchical Regression of Ordinary Violations on the IIP Components*

Variables	$\beta$	$P$	$R^2$	$R^2_{change}$
Step 1		.000	.141	.141
Age	-.376	.000		
Sex	.209	.000		
Annual Mileage	-.052	.299		
Step 2		.000	.244	.103
Age	-.311	.000		
Sex	.182	.000		
Annual Mileage	-.036	.455		
Dominant	.281	.000		
Host-Dom	-.044	.472		
Hostile	.017	.814		
Host-Sub	.106	.108		
Submsv	.022	.769		
Frnd-Sub	.038	.563		
Frnd-Dom	-.041	.485		

*Note: N = 349, Host-Dom = Hostile-Dominant, Host-Sub = Hostile-Submissive,*

*Submsv = Submissive, Frnd-Sub = Friendly-Submissive, Frnd-Dom = Friendly-Dominant*

*Dependent Variable = Ordinary Violations*

The fifth analysis was conducted in order to see the association between positive driver behaviors and interpersonal problems. In the analysis, positive driver behaviors were identified as the DV and interpersonal problems were identified as the IV. In order to control the statistical effects of age, sex, and exposure, these variables were entered in the first step of the analysis. Later, the interpersonal problems were entered at the second step as the IVs. The results of the analysis are showed in the Table 11. The results presented that controlled variables contributed significantly to regression model and accounted for 3% of variation in positive driver behaviors ( $F(3, 345) = .35, p < .05, R^2 = .01$ ). Introducing the interpersonal problems

explained an additional 1% of variation in positive driver behaviors ( $F_{change}(3, 342) = 4.20, p < .05, R^2 = .04$ ). The only interpersonal problem that related to positive driver behaviors was being hostile-dominant; being hostile-dominant was found to be negatively related to positive driver behaviors.

Table 11. *Hierarchical Regression of Positive Driver Behaviors on the IIP Components*

Variables	$\beta$	$P$	$R^2$	$R^2_{change}$
Step 1		.782	.003	.003
Age	-.043	.445		
Sex	-.005	.929		
Annual Mileage	.037	.498		
Step 2		.006	.039	.035
Age	-.080	.162		
Sex	.030	.605		
Annual Mileage	.024	.656		
Dominant	-.058	.318		
Host-Dom	-.151	.029		
Hostile	-.022	.748		

*Note: N = 349, Host-Dom = Hostile-Dominant, Dependent Variable = Positive Driver Behaviors*

### 3.4. *The Representations of Driver Behaviors on Interpersonal Circumplex*

All the computations were made by using the ipsatized data of variables and X and Y coordinates of driver behaviors were obtained. After determining the placements of variables on Interpersonal Circumplex (IPC) space the representations were given in Figure 3.

According to the placement on the IPC space, Aggressive Violations and Ordinary Violations were represented on the ‘low affiliation-high dominance’ quadrant of the circumplex. Thus, the drivers who showed aggressive and/or ordinary violations on traffic context had the characteristics of dominant, hostile-dominant

and hostile octants of the IPC. Moreover, Errors were represented on the 'low affiliation-low dominance' quadrant but close to the 'low affiliation' vector of the circumplex. Thus, error prone drivers had the characteristics of hostile, hostile-submissive and submissive octants of the IPC. Besides, Slips & Lapses were placed very close to 'low affiliation' vector and the center of the circumplex. It almost fell nearly the same distances from all of the octants. Thus, this position had no remarkable characteristics of any of the quadrants of the IPC. And finally, Positive Driver Behaviors were represented on the 'high affiliation-low dominance' quadrant of the circumplex. Thus, the drivers who showed positive driver behaviors on traffic context have the characteristics of submissive, friendly-submissive and friendly octants of the IPC.



Figure 4. *The representations of driver behaviors on interpersonal circumplex model*

## **CHAPTER 4**

### **DISCUSSION**

#### *4.1. General Discussion*

The main aims of this study were to examine the relationship between the driver behaviors on traffic and interpersonal behaviors and see the representations of driver behaviors on the IPC for the first time in the literature. There were many studies that investigated driver behaviors with different individual concepts (Oltedal & Rundmo, 2006; Rimmö & Aberg, 1999; Dahlen & White, 2006; Reimer et al., 2005) however none of these studies attempted to investigate the driver behaviors' relationship with interpersonal behaviors. Moreover, there were different studies that investigated the interpersonal behavior in different contexts (Pincus & Ansell, 2003; Foa, 1961; Horowitz et al., 2006; Forgas, 2002) however there was not such study that tried to see the relationship between IPC and driver behaviors. In this study IPC was used with driver behaviors because the traffic context is an interpersonal context itself and best ways to understand interpersonal behaviors and problems are IPC models. When drivers are in traffic they may be in their vehicles but they are not isolated completely. They still interact with other road users such as other drivers, passengers or pedestrians. Since they are interacting actively with other people on the road; their problems that they experience when they interact with other people are reflected on their behaviors in traffic (which are driver behaviors). Thus, combining these two perspectives would provide new theoretical and practical contributions; so, this relationship could not be ignored to research.

In the following sections, general findings about the study variables and their relationship were discussed separately and in detail. Moreover, critical remarks, implications of the study and suggestions for future researches were presented.

#### *4.2. Evaluation of the Findings*

Before examining the representations of driver behaviors on circumplex model, in order to get more detailed view about the variables was discussed according to data analyses separately.

##### *4.2.1. Evaluation of Descriptive Statistics*

According to the results of the DBQ subscales, the drivers tended to engage in positive driver behaviors on the road than aberrant driver behaviors. Thus, it can be said that drivers tend to evaluate themselves as careful about the traffic environment or other road users and to help and be polite with or without safety concerns (Özkan & Lajunen, 2005). Moreover, they admitted that they carry a good intent in their actions and they intend not to violate the rules but ease the driving. So they all meant that they preferred to show more high affiliation behaviors than low. And that was in accordance with their evaluation on IIP subscales. According to the results of IIP subscales drivers tended to admit that they belong to high affiliation quadrants of the circumplex than others. They reported themselves as on the ‘friendly’ octant of the circumplex mostly and ‘friendly-dominant’ and ‘friendly-submissive’ after. So, it can be interpreted that participants evaluated themselves as people who have the qualities of having overly enthusiastic levels of serving and giving to others, overly generous, caring, trusting and permissive for others, difficulty to put their own needs before others’, a need for engagement with others, a need for pleasing others and gain their approval, inability to say ‘no’ to others, and lack of feeling and expressing anger; also, engaging in positive driver behaviors on the road.

However, among aberrant behaviors drivers admitted that they engage in aggressive violations than any other behaviors. Since aggressive violations included negative intentions, this result was contrary to them because they reported themselves as high affiliation people. Moreover, since drivers rated themselves higher in showing aggressive violations on the road, it was expected that there should have been more people that rated themselves as being on the high dominance and low affiliation quadrants which have the characteristics of not being able to see

others' viewpoints and propensity to having arguments with others, anger and irritability expressions and experiences, disregarding and not supporting other people's needs and welfare, and being irresponsible.

#### *4.2.2. Evaluation of the Bivariate Correlation Analyses*

The Bivariate Correlation Analyses were done to examine the relationship between study variables. The driver behaviors and age relationships have been evidenced many times by some previous studies (Constantinou et al., 2011; Özkan & Lajunen, 2006; Elvik, 2010; Rhodes and Pivik, 2011; Westerman & Haigney, 2000). And in the current study age had negative relationships with active accidents, slips and lapses, and aggressive and ordinary violations. This conclusion supported the literature. Thus, it can be interpreted that as the drivers' ages increased, their tendency to engage in active accidents, slips and lapses and aggressive and ordinary violations decreased. Furthermore, when active accidents variable was evaluated there is a positive relationship with passive accidents, slips and lapses and aggressive and ordinary violations. That was, as the drivers' frequency of active accidents increased their tendency to engage in passive accidents, slips and lapses and aggressive and ordinary violations increased too.

The results also showed that the driver behaviors and the interpersonal problems octants were related to each other. Concerning the relationship between driver behaviors and interpersonal problems, there was a positive relationship between slips and lapses and all the eight octants of IPC. That meant as the frequency of slips and lapses increased, the degree of having interpersonal problems increased as well. Moreover, there was also a positive relationship between errors and all the octants of IPC except for 'friendly' octant. So it meant that the frequency of errors increased, the degree of having interpersonal problems except for 'being friendly' increased as well. Furthermore, there was also a positive relationship between aggressive violations and 'dominant', 'hostile' and 'hostile-submissive' octants of IPC. That meant, as drivers more carried the problems of being 'dominant', 'hostile' and 'hostile-dominant' their frequency of engaging in aggressive violations increased. In addition, there was also a positive relationship

between ordinary violations and all the octants of IPC except for 'friendly' octant, again. So, it can be said that the frequency of ordinary violations increased, the degree of having interpersonal problems except for 'being friendly' increased as well. And lastly, there were negative relationships between positive driver behaviors and 'dominant', 'hostile-dominant' and 'hostile' octants of IPC. That meant, as drivers more carried the problems of being 'dominant', 'hostile' and 'hostile-dominant' their frequency of engaging in positive driver behaviors decreased.

#### *4.2.3. Evaluation of Hierarchical Regression Analysis*

In the current study, different hierarchical regression analyses were conducted to test the relationships between the driver behaviors and interpersonal problems. In the analyses the effects of age, sex, and annual mileage were controlled.

The results revealed that being dominant on the IPC was positively related to the errors, aggressive violations, and ordinary violations. So that meant that, having dominance problems in interpersonal relationships led drivers to commit errors, aggressive violations and ordinary violations on the road. Moreover, it was also indicated that being hostile on IPC was positively related to committing to slips and lapses. Thus, having hostile traits meaning hostility problems in interpersonal relationships led drivers to engage in slips and lapses on the road. Furthermore, according to the results being submissive on the IPC was positively related to engaging in errors. That meant, being submissive in interpersonal relationships as a problem caused drivers to commit errors in traffic context. And lastly, it was indicated that being hostile-dominant on the IPC was negatively related to engaging in positive driver behaviors. So this can be said that, having hostile dominance problems, anger and irritability expressions and experiences, the less a person has the qualities of suspecting and not trusting others, disregarding and not supporting other people's needs and welfare, and being irresponsible; the more that person shows positive driver behaviors on the road. Actually, some of these results were expected. For example, it was known that violations are deliberate deviations from safety which have a potential to be hazardous and they were intentional deviations (Reason et al., 1990). Also, being dominant included being controlling or manipulative,

inability to consider other's perspective and tendency to argue with others (Akyunus, 2012). So, a person who was willing to do any kinds of violations was expected to be disrespectful to safety rules and inconsiderate to other road users and it was not unexpected that having dominance problems on IPC resulted in committing violations in traffic environment. In addition, it was also expected that being hostile-dominant on the IPC was negatively predicted positive driver behaviors. It was known that being hostile-dominant includes experience and expression of anger and irritability and disregard for other's needs and welfare. Also positive driver behaviors included being careful about the traffic environment or other road users and to help and be polite with or without safety concerns (Özkan & Lajunen, 2005). Moreover, the study presented that angry/hostile behavior patterns were found to be predicting risky driving (Schwebel, et al., 2006). So, it was expected to say that the drivers that show positive driver behaviors on roads do not have the characteristics of being hostile-dominant on IPC. However, it was also known that slips and lapses are failures of attention and memory (Reason et al., 1990), so they were cognitive processes. Thus it was unexpected to see that having hostility problems on IPC have a positive relationship with slips and lapses. Because, slips and lapses were caused by cognitive processes they were not supposed to be affected by interpersonal problems.

#### *4.2.4. Evaluation of the Representations of Driver Behaviors on Interpersonal Circumplex*

Interpersonal circumplex offers a balance of comprehensiveness and simplicity; and it helps to build a multidimensional understanding of the interpersonal world (Locke, 2010). In order to evaluate the circumplex clearly, it was important to understand how this model works. The IPC was described graphically by two orthogonal axes: vertical (dominance) and horizontal (affiliation). So, each point within the IPC can be defined as a 'weighted mixture of dominance and affiliation' (Locke, 2010). This model was used for assessing interpersonal dispositions and for each interpersonal disposition there is a particular location in the IPC space (Locke, 2010). Thus, moving around the circle meant finding a reflection of a blend of the two axial dimensions. Moreover, those points within the IPC space

were at some distance from the center and that distance was named as vector. Vector lengths represented how much intensity and consistency was included in particular interpersonal disposition (Locke, 2010). And as the vector got longer, the behavior expressions of that particular segment of the IPC got more exclusive and intense (Locke, 2010). Also, the longer the vector got in a region in IPC space; there was a clearer peak in that region and the clearer drop in the opposite region (Locke, 2010). In the light of that information, representations of driver behaviors in IPC model were evaluated in this section.

According to results it can be seen that aggressive violations and ordinary violations fell on the 'low affiliation-high dominance' quadrant of the IPC. Thus, it can be said that the drivers who showed aggressive and/or ordinary violations on traffic context had the characteristics of dominant, hostile-dominant and hostile octants of the IPC. Those characteristics can be summarized as; intolerance for losing control, not being able to see others' viewpoints, tendency to having arguments with others, expressions and experiences of anger and irritability, not trusting others, disregarding other people's needs, being irresponsible, minimum level of affection and bonding, not having sympathy, nurturance, warmth and generosity to others. So, having those kinds of problems in interpersonal relationships caused drivers to commit in aggressive and/or ordinary violations. There were different studies that supported the statement that there was a positive relationship between hostility and dangerous driving (Gidron, Gaygısız & Lajunen, 2014; Kovacsova, Roskova & Lajunen, 2014; Patil, Shope, Raghunathan & Bingham, 2006). That meant the location of aggressive and ordinary violations in the results were supported by the literature in an indirect way. However, there were not any studies that evaluated the relationship of violations dominance problems in the literature; so, this finding was an important contribution.

In addition, according to the results errors fell on the 'low affiliation-low dominance' quadrant but close to the 'low affiliation' axis of the circumplex. Low affiliation-low dominance quadrant had the characteristics of minimum level of affection and bonding, not having sympathy, nurturance, warmth and generosity to others, feeling anxious, timid and embarrassed with other people around, inability to

starting social interactions, low levels of self-confidence and self-esteem, inability to take initiative, and avoiding from socially challenging situations. But in the position of errors on the circumplex it was emphasized that the error making drivers were minimal feelings of affection for and connection with others, difficulty in maintaining long-term commitments, lack of sympathy, nurturance, warmth, generosity relative to other people (Akyunus, 2012). Also, being on this axis meant being cold/distant traits in interpersonal relationships. On the other hand, according to Reason and his colleagues (1990) even both violations and errors both might had a potential danger and lead to crashes; errors were not deliberate actions compared to violations. That means, errors in driving were involuntary actions and they do not include intentions disregarding the rules or other road users. Still they might include dangerous behaviors and some risks and they might threaten the traffic safety. Because of these characteristics of errors these ‘involuntary’ actions might got affected from having ‘hostility’ problems in interpersonal relationships. And as mentioned before, hostility successfully predicted hazardous driving behaviors (Gidron et al., 2014; Kovacsova et al., 2014; Patil et al., 2006).

Furthermore, the results showed that positive driver behaviors fall on the ‘high affiliation-low dominance’ quadrant of the IPC. Thus, it can be said that the drivers who showed positive driver behaviors on traffic context had the characteristics of submissive, friendly-submissive and friendly octants of the IPC. Those characteristics can be summarized as; having seriously low levels of self-confidence and self-esteem, inability to take initiative, avoiding from socially challenging situations, inability to say ‘no’ to others, lack of feeling and expressing anger, being easy to convince and deceive, being too eager to serve, too ready to give, too generous, too caring, too trusting, too permissive, and difficulty to maintain boundaries in relationships (Akyunus, 2012). So, having those kinds of problems in interpersonal relationships caused drivers to commit in positive driver behaviors. At the same time, positive driver behaviors had the characteristics of being not dependent on certain rules and regulations but caring, helping and being polite for the traffic environment and other road users (Özkan & Lajunen, 2005). So, there was an intention behind those behaviors and those intentions are proactive and helpful.

Moreover, being a polite driver included avoiding the behaviors that may be annoying for other road users and it was expressed in less-demanding driving situations (Özkan & Lajunen, 2005). Furthermore, the socialization process of driving helped drivers to acquire the unofficial driving behaviors; so, positive driver behaviors were ‘good manners of driving’ and they were acquired from experiences in traffic (Özkan & Lajunen, 2005). And lastly according to Özkan and Lajunen (2005), positive driver behaviors and hostile aggression were negatively related; hence, those kinds of behaviors may mean to be ‘good’ for traffic environment and the positive driver behaviors may prevent the places in which interpersonal contacts are frequent from the effects of ‘bad’ behaviors on the roads. So, even those positive driver behaviors carried good intentions behind them according to the place of them on IPC they were affected by having high affiliation problems. Lack of self-confidence, self-esteem, anger expression, assertiveness, taking initiative and being too easy to convince, being too eager to serve and to give are problematic issues in interpersonal relationships and those problems led drivers to convince them to be polite in traffic. Those kinds of drivers may want to create a good impression on other road users, maintain ‘friendly’ relationships with them and they may fear rejection and conflicts because of the interpersonal problems they have.

Lastly, as the thought provoking but not surprising result of the representations slips and lapses fell on a point that very close to the center of the IPC. It can be said that this position had no remarkable characteristics of any of the quadrants. It almost fell nearly same distances from all of the octants. So, as Locke (2010) mentioned that vector lengths represented how much intensity and consistency was included in particular interpersonal disposition. Moreover, moving around the circle meant finding a reflection of a blend of the two axial dimensions which all of them represented different problems in interpersonal relationships (Locke, 2010). In the light of these information it can be said that the position of slips and lapses on IPC did not represent any of the problems. In accordance, it was known that slips and lapses were failures of attention and memory (Reason et al., 1990). So they were caused by cognitive processes of the brain and they had no good or bad intentions. In that case, it is predictable to see that they were not affected by

interpersonal problems. So, they were not represented on the circumplex adequately. In order to see this association more clearly, slips and lapses can be studied with some other variables too and investigated if there is another relational effect of slips and lapses and interpersonal relationships. The content and the structure of the slips and lapses may be examined more deeply in a different study and to explain that link more evidently.

#### *4.3. Critical Remarks*

There are some limitations of the study to mention. First of all, method of data collection was self-report method. This method may contain social desirability bias because participants may have given socially desirable answers. Moreover, the cross-sectional nature of this study may be problematic because it causes difficulty to draw cause and effect relationships, and also there was not the possibility of observing the changes on the sample in a period of time either.

#### *4.4. Implications of the Study and Future Directions*

The aim of this study was to examine and plot the representations of driver behaviors on the IPC space and integrate those two concepts, for the first time. Also, to our knowledge this study is the first one to investigate, the relationship between driver behaviors and IPC structures. Although in the literature there are different studies that indicate the associations of driver behaviors and interpersonal problematic relationships through investigating different individual factors. But this study establishes the direct connection between those two variables. Because it was known that everyday driving is affected not only by technical driving situations but also non-technical non-driving situations. Also, traffic environment is not isolated from social context environment. Drivers connect through their behaviors in traffic and obviously their behaviors affected from their interpersonal relationships. That's why it was important to present the path between interpersonal interactions and driver behaviors. From a theoretical framework, this study is important because of those contributions emphasized above to the literature. From practical point of view, the results showed that in preparing intervention programs for the overly violating or error prone drivers, their interpersonal problem types could be considered. Moreover,

it is valuable for drivers that to learn having problems in interpersonal relationships affects driving behaviors, so they can learn how to manage their actions on the road. Such work might make safe driving interventions more effective.

Because the study the first one in its own area; the future studies which are willing to investigate the interpersonal problems at traffic settings can take this study as a reference study and make some additional investigations based on its findings. After evidencing the proposed relationship in the present study, the future studies might focus on some other investigations including the not-examined variables of this study. For instance, comparison of different age and sex groups or exposure differences in driver behaviors could be investigated. Similarly, cross-cultural comparisons of driver behaviors and interpersonal problems can be made through differences in interpersonal interactions and their relation to the human factors in driving.

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## APPENDICES

### APPENDIX A

#### ETHICAL PERMISSION

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ  
APPLIED ETHICS RESEARCH CENTER



ORTA DOĞU TEKNİK ÜNİVERSİTESİ  
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05 NISAN 2017

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Yrd. Doç. Dr. Bahar ÖZ;


Danışmanlığını yaptığınız yüksek lisans öğrencisi Özge ÖZER'in "*Sürücü Davranışlarının Kişilerarası Problemler ile ilişkisi*" başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek gerekli onay 2017-SOS-046 protokol numarası ile 05.04.2017 – 30.04.2018 tarihleri arasında geçerli olmak üzere verilmiştir.


Bilgilerinize saygılarımla sunarım.


  
Prof. Dr. Ş. Halil TURAN


Başkan V


  
Prof. Dr. Ayhan SOL  
Üye

  
Prof. Dr. Ayhan Gürbüz DEMİR  
Üye

  
Doç. Dr. Maşar KONDAKÇI  
Üye

  
Doç. Dr. Zana ÇITAK  
Üye

  
Yrd. Doç. Dr. Pinar KAYGAN  
Üye

  
Yrd. Doç. Dr. Emre SELÇUK  
Üye

## APPENDIX B

### INFORMED CONSENT FORM/ GÖNÜLLÜ KATILIM FORMU

#### Gönüllü Katılım Formu

Bu çalışma Orta Doğu Teknik Üniversitesi öğretim üyelerinden Yrd. Doç. Dr. Bahar Öz danışmanlığında Trafik ve Ulaşım Psikolojisi yüksek lisans öğrencisi Özge Özer tarafından yürütülmektedir. Bu çalışma, sürücü davranışlarının kişiler arası problemler ile ilişkisini test etmek amacıyla yapılmaktadır. Çalışmada fiziksel veya psikolojik rahatsızlık verebilecek unsurlar bulunmamaktadır. Herhangi bir rahatsızlık duyduğunuz takdirde çalışmayı istediğiniz zaman bırakabilirsiniz.

Elde edilen bilgiler sadece bilimsel araştırma ve yayınlarda kullanılacaktır. Çalışma kapsamında hiçbir kişisel veri toplanmayacak ve kullanılmayacaktır. Çalışma hakkında daha fazla bilgi edinmek için aşağıda iletişim bilgileri verilen araştırmacılar ile iletişime geçebilirsiniz. Bu araştırmaya katıldığınız ve verdiğiniz destek için çok teşekkür ederiz.

Psk. Özge Özer (Tel: 0 555 618 6839), E-posta: ozge.ozer@metu.edu.tr)

Yrd. Doç. Dr. Bahar Öz ( Tel: 0 312 210 2094, E-posta: ozbahar@metu.edu.tr)

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Çalışmaya katılmayı kabul ediyorum.

Ad Soyad/Rumuz:

Tarih:

İmza:

**APPENDIX C**  
**DEMOPGRAPHIC INFORMATION FORM**  
**Demografik Bilgi Formu**

- 1- Yaş: \_\_\_\_\_
- 2- Cinsiyet:\_\_\_Erkek\_\_\_ Kadın
- 3- Eğitim Düzeyi:  
\_\_\_\_\_ Okur –Yazar \_\_\_\_\_ İlkokul \_\_\_\_\_ Ortaokul \_\_\_\_\_ Lise  
\_\_\_\_\_ Yüksekokul \_\_\_\_\_ Üniversite \_\_\_\_\_ Yüksek Lisans/Doktora
- 4- Kaç yıldır ehliyet sahibisiniz? \_\_\_\_\_ yıl
- 5- Son 1 yılda yaklaşık olarak toplam kaç kilometre araç kullandınız? \_\_\_\_\_ km
- 6- Bütün hayatınız boyunca yaklaşık olarak toplam kaç kilometre araç kullandınız? \_\_\_\_\_ km
- 7- 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
- 8- Son üç yılda kaç kez araç kullanırken pasif olarak (bir aracın ya da bir yayanın size çarptığı durumlar) kaza geçirdiniz? (hafif kazalar dahil) \_\_\_\_\_ kez
- 9- Son üç yıl içerisinde, aşağıda belirtilen trafik cezalarını kaç kere aldığınızı belirtiniz.
- a) Yanlış park etme
- b) Hatalı sollama
- c) Aşırı hız
- d) Kırmızı ışıktaki geçme
- e) Diğer (eksik ekipman, kırık far vb.)
- f) Hiç ceza almadım

## APPENDIX D

### DRIVER BEHAVIOR QUESTIONNAIRE (DBQ)

#### Sürücü Davranışları Ölçeği

Aşağıda verilen durumların her birini ne sıklıkta yaparsınız ?							
<p>Aşağıda verilen her bir madde için sizden istenen bu tür şeylerin sizin başınıza NE SIKLIKLA geldiğini belirtmenizdir. Değerlendirmelerinizi geçtiğimiz yıl boyunca kendinizin araç kullanma davranışlarından ne hatırlıyorsanız onları temel alarak yapınız. Lütfen değerlendirmelerinizi size göre doğru olan seçeneği karalayarak belirtiniz. Her bir soru için cevap seçenekleri:</p> <p><b>1= Hiç bir zaman 2= Nadiren 3= Bazen 4= Oldukça sık 5= Sık sık 6= Neredeyse her zaman</b></p>							
		1	2	3	4	5	6
1	Geri geri giderken önceden fark etmediğiniz bir şeye çarpmak						
2	Karşıdan gelen araç sürücüsünün görüş mesafesini koruyabilmesi için uzunları mümkün olduğunca az kullanmak						
3	A yönüne gitmek amacıyla yola çıkmışken kendinizi daha alışkın olduğunuz B yönüne doğru araç kullanırken bulmak						
4	Yasal alkol sınırlarının üzerinde alkollü olduğunuzdan şüphelenseniz de araç kullanmak						
5	Dönel kavşakta dönüş istikametinize uygun olmayan şeridi kullanmak						

6	Anayoldan sola dönmek için kuyrukta beklerken, anayol trafiğine dikkat etmekten neredeyse öndeki araca çarpacak duruma gelmek						
7	Anayoldan bir sokağa dönerken karşıdan karşıya geçen yayaları fark edememek						
8	Başka bir sürücüye kızgınlığınızı belirtmek için korna çalmak						
9	Bir aracı sollarken ya da şerit değiştirirken dikiz aynasından yolu kontrol etmemek						
10	Kaygan bir yolda ani fren veya patinaj yapmak						
11	Gereksiz yere gürültü yapmamak için kornayı kullanmaktan kaçınmak						
12	Otobanda trafik akışını engellemek için en sol şeridi gereksiz yere kullanmaktan kaçınmak						
13	Kavşağa çok hızlı girip geçiş hakkı olan aracı durmak zorunda bırakmak						
14	Şehir içi yollarda hız sınırını aşmak						
15	Sinyali kullanmayı niyet ederken silecekleri çalıştırmak						
16	Sağa dönerken yanınızdan geçen bir bisiklet ya da araca neredeyse çarpmak						
17	Önünüzdeki aracın sürücüsünü, onu rahatsız etmeyecek bir mesafede takip etmek						
18	“Yol ver” işaretini kaçırp, geçiş hakkı olan araçlarla çarpışacak duruma gelmek						

19	Trafik ışıklarında üçüncü vitesle kalkış yapmaya çalışmak						
20	Sola dönüş sinyali veren bir aracın sinyalini fark etmeyip onu sollamaya çalışmak						
21	Trafikte sinirlendiğiniz bir sürücüyü takip edip ona haddini bildirmeye çalışmak						
22	Otoyolda ileride kapanacak bir şeritte son ana kadar ilerlemek						
23	Aracınızı park alanında nereye bıraktığınızı unutmak						
24	Sollama yapan sürücüye kolaylık olması için hızınızı onun geçiş hızına göre ayarlamak						
25	Solda yavaş giden bir aracın sağından geçmek						
26	Arkadan hızla gelen aracın yolunu kesmemek için sollamadan vazgeçip eski yerinize dönmek						
27	Trafik ışığında en hızlı hareket eden araç olmak için yandaki araçlarla yarışmak						
28	Trafik işaretlerini yanlış anlamak ve kavşakta yanlış yöne dönmek						
29	Acil bir durumda duramayacak kadar, öndeki aracı yakın takip etmek						
30	Aracınızı park ederken diğer yol kullanıcılarının (yaya, sürücüler, vb) hareketlerini sınırlamamaya özen göstermek						
31	Trafik ışıkları sizin yönünüze kırmızıya döndüğü halde kavşaktan geçmek						

32	Bazı tip sürücülere kızgın olmak (illet olmak) ve bu kızgınlığı bir şekilde onlara göstermek						
33	Aracınızı kullanırken yol kenarında birikmiş suyu ve benzeri maddeleri yayaların üzerine sıçratmamaya dikkat etmek						
34	Yayaların karşıdan karşıya geçebilmeleri için geçiş hakkı bende dahi olsa durarak yol veririm						
35	Seyahat etmekte olduğunuz yolu tam olarak hatırlamadığınızı fark etmek						
36	Sollama yaparken karşıdan gelen aracın hızını olduğundan daha yavaş tahmin etmek						
37	Otobanda hız limitlerini dikkate almamak						

## APPENDIX E

### INVENTORY OF INTERPERSONAL PROBLEMS - CIRCUMPLEX (IIP-C)

#### Kişilerarası Problemler Ölçeği – Döngüsel Model

İnsanlar başkalarıyla ilişkilerinde aşağıda belirtilen problemleri yaşadıklarını ifade etmektedirler. Lütfen aşağıdaki ifadeleri okuyun ve her maddeyi hayatınızdaki **HERHANGİ BİR ÖNEMLİ KİŞİYLE** (aile bireyleri, dostlar, iş arkadaşları gibi) **İLİŞKİNİZDE** sizin için problem olup olmadığına göre değerlendirin. Problemin **SİZİN İÇİN NE KADAR RAHATSIZ EDİCİ OLDUĞUNU** numaralandırılmış daireleri yuvarlak içine alarak belirtiniz.

Aşağıdaki ifadeler başkalarıyla ilişkilerinizde yapmakta ZORLANDIĞINIZ şeylerdir.	Hiç değil	Biraz	Orta derecede	Oldukça	Fazlasıyla
Benim için,					
1. Başkalarına “hayır” demek zordur.	1	2	3	4	5
2. Gruplara katılmak zordur.	1	2	3	4	5
3. Bir şeyleri kendime saklamak zordur.	1	2	3	4	5
4. Birine beni rahatsız etmemesini söylemek zordur.	1	2	3	4	5
5. Kendimi yeni insanlara tanıtmak zordur.	1	2	3	4	5
6. İnsanları ortaya çıkan problemlerle yüzleştirmek zordur.	1	2	3	4	5
7. Başkalarına kendimi rahatlıkla ifade etmek zordur.	1	2	3	4	5
8. Başkalarına kızgınlığımı belli etmek zordur.	1	2	3	4	5

9. Başkalarıyla sosyalleşmek zordur.	1	2	3	4	5
10. İnsanlara sıcaklık/ şefkat göstermek zordur.	1	2	3	4	5
11. İnsanlarla anlaşmak/ geçinmek zordur.	1	2	3	4	5
12. Başkalarıyla ilişkimde, gerektiğinde kararlı durabilmek zordur.	1	2	3	4	5
13. Başka birisi için sevgi/ aşk hissetmek zordur.	1	2	3	4	5
14. Başka birinin hayatındaki amaçları için destekleyici olmak zordur.	1	2	3	4	5
15. Başkalarına yakın hissetmek zordur.	1	2	3	4	5
16. Başkalarının problemlerini gerçekten umursamak zordur.	1	2	3	4	5
17. Başkalarının ihtiyaçlarını kendi ihtiyaçlarımdan öne koymak zordur.	1	2	3	4	5
18. Başka birinin mutluluğundan memnun olmak zordur.	1	2	3	4	5
19. Başkalarından benimle sosyal amaçla bir araya gelmesini istemek zordur.	1	2	3	4	5
20. Başkalarının duygularını incitmekten endişe etmek sizin kendimi rahatlıkla ifade etmek zordur.	1	2	3	4	5

Aşağıdaki ifadeler ÇOK FAZLA yaptığınız şeylerdir.	Hiç değil	Biraz	Orta derecede	Oldukça	Fazlasıyla
21. İnsanlara fazlasıyla açılıyorum/ içimi dökerim.	1	2	3	4	5
22. Başkalarına karşı fazlasıyla agresifim / saldırganım.	1	2	3	4	5
23. Başkalarını memnun etmek için fazlasıyla uğraşırım.	1	2	3	4	5

24. Fark edilmeyi fazlasıyla isterim.	1	2	3	4	5
25. Başkalarını kontrol etmek için fazlasıyla uğraşırım.	1	2	3	4	5
26. Sıklıkla (fazlasıyla) başkalarının ihtiyaçlarını kendi ihtiyaçlarımın önüne koyarım.	1	2	3	4	5
27. Başkalarına karşı fazlasıyla cömertim.	1	2	3	4	5
28. Kendi istediğimi elde edebilmek için başkalarını fazlasıyla yönlendiririm.	1	2	3	4	5
29. Başkalarına kişisel bilgilerimi fazla anlatırım.	1	2	3	4	5
30. Başkalarıyla fazlasıyla tartışırım.	1	2	3	4	5
31. Sıklıkla (fazlasıyla) başkalarının benden faydalanmasına izin veririm.	1	2	3	4	5
32. Başkalarının ızdırabından / mağduriyetinden fazlasıyla etkilenirim.	1	2	3	4	5

## APPENDIX F

### TÜRKÇE ÖZET / TURKISH SUMMARY

#### SÜRÜCÜ DAVRANIŞLARININ İNCELENMESİ: KİŞİLERARASI PROBLEMLER İLE İLİŞKİLERİ VE KİŞİLERARASI DÖNGÜSEL MODEL ÜZERİNDEKİ TEMSİLLERİ

##### GİRİŞ

Trafik kazaları dünyadaki en büyük ölüm ve yaralanma nedenlerinden biridir. Dünya Sağlık Örgütü'nün (WHO) raporuna göre, trafik kazalarında yıllık 1,25 milyon insan ölmekte ve 20 ila 50 milyon arasında insan yaralanmaktadır (2015). Trafik insan hayatının ve sağlığın büyük bir parçasıdır. İnsanlar için tehlikeli bir ortam olsa bile aynı zamanda trafik sosyal bir ortamdır. İnsanlar da oldukça sosyal varlıklardır ve en karmaşık ve farklı kişiler arası ilişkilere sahiptirler. İnsanların yaşamlarını sürdürmeleri için birbirleriyle işbirliği yapmaları gerekmekte birlikte, karşılaştıkları sıkıntının önemli bir kısmı kişiler arası ilişkilerdeki sorunlarından kaynaklanmaktadır (Çabuk, 2015). Hayatlarındaki diğer insanlarla aktif olarak etkileşime girdikleri kadar yolda başkalarıyla da aktif etkileşime girmektedirler ve diğer insanlarla etkileşime girerken karşılaştıkları problemler trafikteki davranışlarına yansır.

##### Sürücülükte İnsan Faktörü

İnsanlar trafikte sürücüler, yayalar ve yolcular olarak yer alırlar. Böylece, sürücülükteki insan faktörleri iki boyutta incelenebilir: sürücü davranışları ve becerileri. Elander, West and French'e (1993) göre, sürücü davranışları, sürücülerin (alışkanlık olarak) araç sürmeyi seçme yolları olarak tanımlanabilir. Başka bir deyişle, sürücülerin trafik ortamında genellikle neler "yaptıkları" anlamına gelir. Öte yandan, sürücü becerilerinin tanımlanması, bilgi işleme ve algısal motor ve güvenlik becerilerinden oluşur ve sürücülük deneyimi ile artar (Elander ve ark., 1993). Başka bir deyişle, trafik ortamında sürücülerin neler "yapabildikleri" anlamına gelir. Bununla birlikte, yapılan araştırmalar incelendiğinde trafik kazalarının çoğunun sürücülerin davranışlarından kaynaklandığı görülmektedir (EGM, 2017). Dolayısıyla,

insan davranışlarının trafik ortamlarındaki önemli rolü ve etkisi yadsınamazdır. Bu çalışmada, odak sürücü becerileri yerine sürücü davranışları üzerinedir bu nedenle aşağıdaki bölümlerde sürücü davranışları ayrıntılı olarak açıklanacaktır.

#### Sürücü Davranışları: Hatalar ve İhlaller

Literatürde insan faktörleri farklı modellerle incelenmektedir. Reason ve meslektaşlarının modeli (1990), sürücü davranışları araştırmaları ve çalışmalarında kilometre taşı olabilir. Reason'un (1990) modeline göre, sürücü davranışları trafik ortamlarında "ihlaller" ve "hatalar" olmak üzere iki ana tür sapkın (kuraldan sapan) davranışa ayrılabilir. Hatalar "planlanan eylemlerin amaçlanan sonuçlarının başarısızlığa uğraması" olarak tanımlanmaktadır ve ihlaller "potansiyel olarak tehlikeli bir sistemin güvenli bir şekilde yürütülmesi için gerekli olduğuna inanılan uygulamalardan kasıtlı sapmalar" olarak tanımlanmaktadır (Reason ve ark., 1990). Buna ek olarak, farklı hata türleri vardır: ihmaller ve dikkatsizlikler. Diğer taraftan, ihlaller trafik ortamında yapılan kasıtlı eylemlerdir. Hatalar ve ihlaller bazen aynı eylem dizisi içinde bulunabilirler (Reason ve ark., 1990). Bununla birlikte, bir sürücü bir ihlal olmaksızın bir hata yapabilir ve bir hata yapmadan bir ihlali gerçekleştirebilir. Bu belirsiz ayrımla gündeme getirilen soru, davranışta kasıt olup olmamasına göre cevaplanabilir (Reason ve ark., 1990). Yukarıda bahsedilen kategoriler arasındaki tüm bu farklılaşma, Manchester Sürücü Davranışı Ölçeğinin geliştirilmesi için bir temel oluşturmuştur (SDÖ; Reason ve ark., 1990). SDÖ genellikle trafik ortamında sürücü davranışlarını ölçmek için kullanılır ve odak noktası sürücülerin sapkın davranışlarını anlamak ve ayırmaktır. Üstelik SDÖ'de sürücü hataları, ihlaller ve dikkatsizlikler ve ihmaller sürücü davranışlarının üç faktörlü yapısıdır. Lawton, Parker, Manstead ve Stradling (1997), SDÖ'nün ihlal alt ölçeğine yeni maddeler eklemiştir ve ihlal faktörünü ikiye bölmüştür: sıradan ihlaller ve saldırgan ihlaller. Bu ayrıma göre, sıradan ihlaller saldırgan bir niyet taşımaksızın bir ihlali taşımaktadır ve agresif ihlaller bariz agresif eylemleri içerir (Lawton ve ark., 1997). İhlallerle ilgili başka bir kavram daha bulunmaktadır: kişiler arası ihlaller. "Kişiler arası" ihlaller "saldırgan" ihlallerle yakından ilişkili olsa bile aralarındaki farklılıklar altındaki farklı motivasyonlardan kaynaklanmaktadır (Mesken, Lajunen & Summala, 2002). Kişiler arası ihlaller, sürücülerin diğer yol

kullanıcılarının haklarına saygı göstermemesi ve başkalarına fiziksel veya psikolojik zarar verme potansiyeline sahip olması sonucu ortaya çıkmaktadır (Mesken, Lajunen & Summala, 2002). Literatürde, SDÖ'nün faktör yapısını araştıran birçok farklı araştırma bulunmaktadır ama Reason ve ark. (1990) tarafından sunulan orijinal faktör yapısı yani hatalar ve ihlaller arasındaki ayırım en istikrarlı olan olarak gözükmektedir. Türkiye'de SDÖ, hatalar, ihmaller ve dikkatsizlikler, sıradan ihlaller ve saldırgan ihlaller olarak dört faktör yapısıyla kullanılmaktadır (Lajunen & Özkan, 2004) ve SDÖ Lajunen, Sümer ve Özkan tarafından 2003 yılında Türkçe'ye uyarlanmıştır.

#### Pozitif Sürücü Davranışları

Trafikte olumsuz davranışlara odaklanmak, trafik güvenliği müdahaleleri açısından iyi gerekçelendirilmiş olsa bile, gündelik sürücülükte sapkın davranışlardan başka davranışlar da vardır (Özkan & Lajunen, 2005). Bu davranışlar kurallara ve yönetmeliklere bağlı olmayabilir veya güvenliği göz önüne almayabilir. Bu davranışların en önemli motivasyonu, trafik ortamı için veya diğer yol kullanıcıları için dikkatli olmak, güvenlik endişeleri olmadan da yardım etmek ve kibar olmaktır (Özkan & Lajunen, 2005). Bu tür davranışlar "Pozitif Sürücü Davranışları" olarak adlandırılmaktadır.

#### Sürücü Davranışlarıyla İlgili Faktörler

Literatürde, sürücü davranışları ile bazı kişisel faktörler arasında ilişkili çalışmalar bulunmaktadır; örneğin yaş (örn. Constantinou ve ark., Özkan ve Lajunen, 2006; Elvik, 2010; Rhodes & Pivik, 2011), cinsiyet (Rhodes & Pivik, 2011) (Schwebel ve ark., 2006; Rimmö & Aberg, 1999; Dahlen ve ark., 2005) ve bazı psikolojik patolojiler (Reimer ve diğerleri, 2005; Olteidal & Rundmo, 2006). Çalışmanın ilerleyen bölümünde, bu çalışmanın içeriği dahilindeki sürücülük davranışlarıyla ilgili kritik değişkenler sunulmuştur. Yaş, cinsiyet ve maruz kalma en ağırlıklı demografik değişkenler olduğu için bu çalışmanın kapsamına dâhil edilmiştir. Bahsedilen değişkenler sürekli olarak trafikte insan faktörleri ile ilişkili olarak bulunmuştur.

## Kişilikle İlgili Faktörler

Araştırmalar sürücülük davranışının dolaylı olarak kişilikle ilişkili olabileceğini göstermektedir. Örneğin kişilik (heyecan arama, vicdanlı, öfkeli / düşmanca davranış) ve riskli sürücülük davranışları arasında pozitif yönde bir ilişki bulunmaktadır (Schwebel, Severson, Ball & Rizzo, 2006). Ayrıca, Olteidal & Rundmo'nun (2006) çalışması kaygı ve sürücülük davranışları arasındaki ilişkinin ortalama bir etkiye sahip olduğunu göstermektedir; ancak kaygı seviyesi çok yüksek veya çok düşükse kaygı hala riskli sürücülükle ilişkili olabilmektedir (Olteidal & Rundmo, 2006). Buna ek olarak, sürücü öfkesi cinsiyet ve yaş farkı olmaksızın sürücülük davranışıyla ilişkilidir (Dahlen & White, 2006). Başka bir çalışmada dürtüselliğin ve can sıkılmasına yatkınlığın kaza ile ilgili durumları, agresif sürücülüğü ve sürücülükte öfke ifadesini yordadığı bulunmuştur (Dahlen, Martin, Ragan ve Kuhlman, 2005). Sürücülük davranışının farklı bireysel değişkenlerden etkilendiği kanıtlanmıştır. Daha önce vurgulandığı gibi, insanlar sosyal yaratıklardır ve tüm davranışları, bireysel değişkenlere ek olarak sosyal ilişkilerinden etkilenir. Kişiler arası ilişkilerde insanlar çeşitli tutum, inanç, sorun ve davranışlara sahiptir. Bu nedenle, aşağıdaki bölümlerde kişiler arası davranışlar ve inceleme ve yorumlama için özel yöntemleri ayrıntılı olarak açıklanmıştır.

## Kişiler Arası Davranış

Foa'nın (1961) belirttiği gibi, kişiler arası davranışın, bir kişinin kendine ve diğerlerine karşı duygusal bir ilişki kurma girişimi olduğu gibi aynı zamanda kendiyile ve daha büyük bir referans grupta bir bağ kurma girişiminde bulunmasıdır. Horowitz ve ark.na göre (2006), kişiler arası davranışlar motivasyonlu davranışlardır. Örneğin, bir kişi başka biriyle etkileşime başladığında, bu davranışın hedefe yönelik olduğu varsayılır. Bununla birlikte, kişinin bu amaç hakkında bilinçli olması her zaman gerekli değildir ve bu hedefin önemi önemsizden hayatiye kadar farklılık gösterebilmektedir (Horowitz ve ark., 2006). Etkilenimin insanların stratejik kişiler arası davranışlarını planlama ve yürütme yöntemleri ve içeriği üzerinde büyük ve karmaşık bir etkisi vardır (Forgas, 2002). Dahası, insanların toplumsal durumlara dair yapıcı çıkarımları ve bir sonraki kişiler arası davranışları yadsınamaz bir şekilde

etkilenimden etkilenmektedir (Forgas, 2002). Davranış ve etkilenim dışında, kişiler arası davranışlar insanlar arasındaki beklentilerden etkilenir. Jones'a (1986) göre sosyal uyum için kişiler arası beklentiler gereklidir. Kişiler arası davranışların farklı türleri vardır ve özel yapılar altında incelenirler. Döngüsel model bu davranışları inceleyen yöntemlerden biridir.

### Kişiler Arası Döngüsel Model

Bireylerin kişiler arası davranışlarının sınıflandırılması ampirik olarak üretilen bir dairesel modele yol açmaktadır (Pincus & Ansell, 2003). Bu dairesel alana "circumplex (döngüsel model)" adı verilir ve bu alan iki boyuttan oluşur. Horowitz ve ark.na göre (2006), bu boyutlar sırasıyla 'insanlar arasındaki bağlantı' ve 'bir kişinin diğerine olan etkisi' olarak örneklenebilir. Bu modele göre, yakınlık ve baskınlık bir döngüsellikteki temel koordinatları temsil eder; dolayısıyla, kişiler arası davranış, bu koordinatların bir kombinasyonu olarak açıklanabilir (Alden ve ark., 1990; Horowitz ve ark., 2003; Akyunus & Gençöz, 2016'da belirtildiği gibi). Yatay ekseninde yakınlık boyutu, düşmanlık davranışları ve dostane davranışlar arasında değişmektedir. Aynı zamanda dikey ekseninde baskınlık boyutu hakimiyet ve teslim olma arasında değişmektedir (Alden ve diğerleri, 1990; Horowitz ve diğerleri, 2003; Akyunus & Gençöz, 2016'da belirtildiği gibi). Bir dizi kişiler arası alanlardaki bireysel farklılıklar Kişiler Arası Döngüsel (KAD) model ile geometrik olarak gösterilebilir. Dolayısıyla, döngünün iki ana boyutunun harmanları, bu alanlar arasındaki bireysel farklılıkların tüm özelliklerini tanımlayabilir (Pincus & Ansell, 2003). Döngünün 360° çevresinde, sözü edilen yakınlık ve baskınlık karışımları bulunabilir. Döngüdeki birbirine komşu olan oktantlar kavramsal ve istatistiksel olarak benzerdir, 90°'deki oktantlar kavramsal ve istatistiksel olarak bağımsızdır ve 180°'deki oktantlar kavramsal ve istatistiksel karşıtlardır (Pincus & Ansell, 2003). Döngüsel modelin başı ya da sonu yoktur ve bir sürekliliktir (Carson, 1969, 1996; Gurtman & Pincus, 2000; Pincus & Ansell, 2003). KAD model bileşenleri birbirleri arasında herhangi bir etkileşim içermez (Pincus & Ansell, 2003). Bireylerin yaşadığı kişiler arası işlevsellikteki çeşitli zorlukları ölçmek için "Kişilerarası Problemler Envanteri (KPE)" adlı envanter geliştirilmiştir (Horowitz, Rosenberg, Baer, Ureno ve Villasenor, 1988). KAD modelinin sekiz boyutuyla bağlantılı olarak, KPE sekiz alt

ölçek içerir. Bununla birlikte, envanterde KPE alt ölçeklerinde oktantların isimleri değiştirilmiştir.

### Sürücü Davranışları ve Kişiler Arası Problemler Arasındaki İlişki

Literatürde, sürücü davranışları birçok problemlili durumla incelenmiştir, ancak kişiler arası ilişkilerle doğrudan çalışılmamıştır. Sürücüler, trafikle ilgili uyaranlardan olumsuz veya olumlu olarak etkilenebildikleri gibi, duygularını, streslerini veya günlük yaşantılarındaki kaygılarını trafik ortamına aktarmaktadırlar. Trafik ortamı, kişiler arası etkileşimi içeren bir ortamdır. Sürücüler trafikte yalnız değildir; birçok diğer etkileşimli hayat ortamında olduğu gibi sözlü bir etkileşim olmasa bile, ifadeler ve tutumlar yollardaki davranışlara yansır ve trafik ortamındaki etkileşimler davranışlar yoluyla insanlar arasında aktarılır. Tabii ki, bu etkileşim her zaman olumlu veya hoş değildir. Kişilerin kişiler arası ilişkilerde sahip oldukları sorunlar, davranışları aracılığıyla kendilerini ifade etme biçimine yansır.

### Amaç

Bu çalışmanın iki ana amacı vardır: birincisi, sürücü davranışları ve kişiler arası sorunlar arasındaki ilişkiyi incelemektir; ikincisi, kişiler arası döngüsel model üzerinde farklı sürücü davranışlarının temsillerini incelemektir. Böylece bu iki kavram literatürde ilk kez birbirleriyle ilişkili olarak incelenecektir.

## YÖNTEM

### Katılımcılar

Araştırmanın örneklemini, geçerli ehliyete sahip 357 (109 kadın, 246 erkek) Türk vatandaşı, yetişkin ve düzenli olarak trafikte araç kullanan kişilerden oluşmaktadır. Katılımcılar Türkiye'deki farklı şehirlerdendir. Katılımcıların yaşları 18 ile 70 arasında değişmektedir.

### Prosedür

Veri toplama başlamadan önce, ODTÜ İnsan Araştırmaları Etik Kurulu'ndan etik onay alınmıştır. Katılımcılar çalışmaya e-posta ve sosyal medya duyuruları

yoluyla davet edilmiştir. Bazı katılımcılar çalışmayı çevrimiçi tamamlamıştır ve çevrimiçi sistem mevcut olmayan bazı katılımcılara çalışma basılı olarak dağıtılmıştır. Çalışma başladığında, katılımcılara bilgilendirilmiş bir onay formu verilmiştir. Katılımcılara anonimlik ve gizlilik hakkında bilgi verilmiştir ve demografik soruları tamamlamışlardır. Hiçbir kişisel bilgi sorulmamıştır. Bu adımlar tamamlandığında anketler başlatılmıştır ve tüm katılımcıların tüm soruları cevaplaması beklenmiştir.

## Materyaller

### Demografik Bilgi Formu

Katılımcılara yaşları, cinsiyetleri, eğitim düzeyleri, geçerli bir ehliyet sahibi olma süreleri (yıl olarak), toplam ve yıllık kilometre sayıları ve trafik cezası ile kaza sayıları sorulmuştur.

### Kişilerarası Problemler Envanteri – Döngüsel Model (KPE-D)

KPE-D, katılımcıların tutumlarını değerlendirdikleri 5 puanlı Likert tipi bir ölçektir (1 = Hiç değil, 5 = Fazlasıyla). Aynı zamanda, sekiz alt ölçek içeren 32 maddelik bir öz bildirim ölçeğidir ve tüm alt ölçeklerin ayrı olarak dört ögesi vardır. Kişilerin kişiler arası ilişkilerindeki zorlayıcı deneyimleri açıklamak için geliştirilmiştir (Horowitz, Rosenberg, Baer, Ureno ve & V Villasenor, 1988).

### Sürücü Davranışları Ölçeği (SDÖ)

SDÖ katılımcıların davranış sıklıklarını derecelendiren bir 6 puanlı Likert tipi ölçektir (1 = Hiçbir zaman, 6 = Her zaman). Ayrıca, beş alt ölçeği de içeren 37 maddelik öz bildirim ölçeğidir. Katılımcıların olumsuz sürücü davranışlarını ölçmek için SDÖ verilmiştir ve pozitif davranışları ölçmek için Pozitif Sürücü Davranışları Ölçeği kullanılmıştır.

## BULGULAR

### Analiz Yöntemi

Bu çalışmada, tüm hesaplamalar IBM SPSS Statistics V.20 programı ile yapılmıştır. İlk aşamada, çalışmada kullanılan değişkenlerin tanımlayıcı istatistiksel değerleri hesaplanmıştır. Bundan sonra, değişkenler arasındaki temel ilişkileri görmek için iki değişkenli korelasyon analizleri yapılmıştır. Daha sonra, SDÖ, pozitif sürücü davranışları ölçeği ve KPE ile alt ölçekleri arasındaki ilişkileri araştırmak amacıyla hiyerarşik regresyon analizleri yapılmıştır. Sürücü davranışlarının kişiler arası döngüsel model üzerinde temsil edilmesini gözlemlemek için, SDÖ, pozitif sürücü davranışları ölçeği ve KPE ile önceki çalışmalara göre benzer istatistiksel prosedürler uygulanmıştır (Locke, 2010; Akyunus & Gençöz, 2016).

### Tanımlayıcı İstatistiksel Değerler

Sonuçlar değerlendirildiğinde, katılımcıların pozitif sürücü davranışlarını diğer sürücü davranış kategorilerinden daha yüksek olarak değerlendirdikleri görülmektedir. Dahası, sapkın sürücü davranışları ile ilgili olarak, katılımcılar kendilerini agresif ihlaller kategorisinde en yüksek şekilde derecelendirmişlerdir. Dahası, KPE değerleri incelendiğinde, tüm alt ölçeklerin, KPE'nin ortalama puanlarına göre katılımcılar tarafından benzer şekilde derecelendirildiği söylenebilir. Bununla birlikte, KPE'nin arkadaşça oktantı diğer yedi oktantla karşılaştırıldığında en yüksek ve baskın oktant en düşük olarak derecelendirilmiştir.

### İki Değişkenli Korelasyon Analizleri

Bazı demografik değişkenler ile SDÖ değişkenleri arasındaki ilişki incelendiğinde, yaş ile ve dikkatsizlikler, saldırgan ihlaller ve sıradan ihlaller arasında anlamlı bir negatif ilişki olduğu görülmektedir. Bir katılımcının bir sürücü belgesi sahibi olma süresi uzadıkça, aktif kazalar, dikkatsizlikler ve saldırgan ihlaller sayısı azalmaktadır. Aktif kazaların sayısı ile dikkatsizlikler, saldırgan ihlaller ve sıradan ihlaller arasında pozitif bir ilişki vardır. Ayrıca, pasif kazalar ile saldırgan ihlaller ve sıradan ihlaller arasında pozitif ilişki vardır.

SDÖ alt ölçekleri ile KPE alt ölçekleri arasındaki korelasyonlar incelendikten sonra görülmüştür ki SDÖ'nün 'dikkatsizlikler' alt ölçeği, KPE alt ölçeklerinin tümü ile pozitif korelasyon göstermektedir. Ayrıca, SDÖ'nün 'hatalar' alt ölçeği KPE'nin baskınlık, düşmanca-baskın, düşmanca, düşmanca-itaatkar, itaatkar, arkadaşça-itaatkâr ve arkadaşça-baskın alt ölçekleri ile pozitif bir ilişkiye sahiptir. Dahası, SDÖ'nün 'agresif ihlaller' alt ölçeği ile KPE'nin düşmanca ve düşmanca-itaatkar alt ölçekleri arasında pozitif bir ilişki vardır. Buna ek olarak, SDÖ'nün 'sıradan ihlaller' alt ölçeği ile KPE'nin baskın, düşmanca-baskın, düşmanca, düşmanca-itaatkar, itaatkar, arkadaşça-itaatkâr olmak ve arkadaşça-baskın alt ölçekleri arasında pozitif ilişkiler bulunmaktadır. Ve son olarak olumlu sürücü davranışları bazı KPE alt ölçekleri ile negatif korelasyon göstermektedir; baskın, düşmanca-baskın ve düşmanca olmak gibi.

#### Hiyerarşik Regresyon Analizleri

Takip eden bölümde, sürücü davranışları ve kişiler arası problemler arasındaki ilişkileri test etmek için hiyerarşik regresyon analizleri kullanılmıştır. Yaş, cinsiyet ve maruz kalmanın istatistiksel etkilerini kontrol etmek için, bu değişkenler analizin ilk adımına girilmiştir. Daha sonra, kişiler arası problemler bağımsız değişken olarak 2. adımda girilmiştir. Değişik sürücü davranışları da analizde bağımlı değişkenler olarak tanımlanmıştır. Birinci analiz, dikkatsizlikler ve ihmaller ile kişiler arası problemler arasındaki ilişkiyi görmek amacıyla yürütülmüştür. KPE'de düşmanca olmanın dikkatsizlik ve ihmallerle pozitif ilişkili olduğu tespit edilmiştir. İkinci analiz, hatalar ve kişiler arası problemler arasındaki ilişkiyi görmek için yürütülmüştür. KPE'de baskın olmak ve itaatkar olmak hatalar ile pozitif ilişkili bulunmuştur. Üçüncü analiz, saldırgan ihlallerle kişiler arası problemler arasındaki ilişkiyi görmek amacıyla yürütülmüştür. KPE'de baskın olmak agresif ihlallerle pozitif ilişkili bulunmuştur. Dördüncü analiz, sıradan ihlallerle kişiler arası problemler arasındaki ilişkiyi görmek amacıyla yapılmıştır. KPE'de baskın olmak, sıradan ihlallerle pozitif ilişkili bulunmuştur. Beşinci analiz, pozitif sürücü davranışları ile kişiler arası problemler arasındaki ilişkiyi görmek amacıyla yapılmıştır. KPE'de düşmanca-baskın olmanın pozitif sürücü davranışlarıyla negatif olarak ilişkili olduğu bulunmuştur.

## Sürücü Davranışlarının Kişiler Arası Döngüsel Model Üzerindeki Temsilleri

KAD model alanındaki yerleşime göre, agresif ihlaller ve sıradan ihlaller, döngünün "düşük yakınlık-yüksek baskınlık" çeyreğinde temsil edilmiştir. Hatalar "düşük yakınlık-düşük baskınlık" çeyreğinde ancak "düşük baskınlık" vektörüne oldukça yakın bir konumda temsil edilmiştir. Ayrıca, dikkatsizlikler ve ihmaller "düşük yakınlık" vektörüne yakın olsa da neredeyse döngünün merkezinde temsil edilmiştir. Son olarak, pozitif sürücü davranışları döngünün "yüksek yakınlık-düşük baskınlık" çeyreğinde temsil edilmiştir.

## TARTIŞMA

Bu çalışmanın temel amacı trafikteki sürücü davranışları ile kişiler arası davranışlar arasındaki ilişkiyi incelemek ve sürücü davranışlarının KAD modeli üzerindeki temsillerini literatürde ilk defa görmektir. Farklı kişisel kavramlarla sürücü davranışlarını araştıran birçok çalışma bulunmaktadır (Oltedal ve Rundmo, 2006; Rimmö & Aberg, 1999; Dahlen & White, 2006; Reimer ve ark., 2005) ancak bu çalışmaların hiçbiri sürücü davranışlarının kişiler arası davranışlarla ilişkisini çalışmamıştır. Trafik ortamı bir kişiler arası ilişkiler ortamı olduğu için ve kişiler arası davranışları ve sorunları anlamamanın en iyi yolları KAD modelleri olduğu için KAD modeli sürücü davranışlarıyla birlikte bu çalışmada ele alınmıştır. Bu iki perspektifi birleştirmek yeni teorik ve pratik katkılar sağlayacaktır ve bu ilişki araştırma için göz ardı edilemez bir ilişkidir.

### Bulguların Değerlendirilmesi

#### Tanımlayıcı Analizlerin Değerlendirilmesi

SDÖ alt ölçeklerinin sonuçlarına göre, sürücüler kendilerini sapkın sürücü davranışlarına göre pozitif sürücü davranışlarına daha fazla meyilli olarak değerlendirmişlerdir. Dolayısıyla, sürücülerin kendilerini trafik ortamı veya diğer yol kullanıcıları hakkında güvenlik kaygısı ile veya güvenlik kaygısı olmadan dikkatli olarak değerlendirmeye eğilimli oldukları söylenebilir (Özkan & Lajunen, 2005). KPE alt ölçeklerindeki sonuçlara göre, sürücüler döngünün yüksek yakınlık çeyreklerine ait olduklarını belirtmişlerdir.

## İki Değişkenli Korelasyon Analizlerinin Değerlendirilmesi

İki değişkenli Korelasyon Analizi, çalışma değişkenleri arasındaki ilişkiyi incelemek amacıyla yapılmıştır. Sürücülerin yaşları arttıkça aktif kazalar, dikkatsizlikler ve ihmaller, agresif ve sıradan ihlallerin azaldığı yorumlanabilir. Sürücülerin aktif kaza sıklığı arttıkça, pasif kazalar, dikkatsizlikler ve ihmaller ve saldırgan ve sıradan ihlaller de artmaktadır. Ayrıca hataların sıklığı arttıkça, 'arkadaşça olma' dışında kişiler arası sorunlara sahip olma derecesi de artar. Sürücülerin "baskın", "düşmanca" ve "düşmanca baskın" olma sorunlarını daha fazla taşıdıkça, saldırgan ihlallere karışma sıklığı da artmaktadır. Sıradan ihlallerin sıklığı arttıkça, 'dostça olma' dışında kişiler arası sorunlara sahip olma derecesi de artmaktadır. Sürücüler "baskınlık", "düşmanca" ve "düşmanca baskın" olma sorunlarını daha çok taşıdıkça olumlu sürücü davranışlarını gösterme sıklığı azalmaktadır.

## Hiyerarşik Regresyon Analizinin Değerlendirilmesi

Kişiler arası ilişkilerde baskınlık problemleri yaşanması, sürücülerin trafikte hata, agresif ihlal ve sıradan ihlal yapmalarına yol açmaktadır. Kişiler arası ilişkilerde düşmanca özelliklere sahip olması, sürücülerin trafikte dikkatsizlik ve ihmaller göstermesine yol açar. Kişiler arası ilişkilerde itaatkâr olmak sürücülerin trafik ortamında hatalar yapmasına neden olmaktadır. KAD modelinde düşmanca baskınlığın olumlu sürücü davranışları ile negatif ilişkili olduğu görülmüştür.

## Sürücü Davranışlarının Kişiler arası Döngüsel Model Üzerindeki Temsillerinin Değerlendirilmesi

Sonuçlara göre, başkalarının bakış açılarını görememe, başkaları ile tartışmaya girme eğilimi, öfke ve sinirlilik ifadesi ve deneyimi, başkalarına güvenmeme, diğer insanların ihtiyaçlarını göz ardı etme, sorumsuz olma, asgari düzeyde sevgi ve bağlanma, sempati, bakım, sıcaklık ve başkalarına cömertlik bulunmaması gibi özelliklere sahip olmak sürücülerin trafikte agresif ve sıradan ihlal yapmalarına yol açmaktadır. İkinci olarak, başkalarına sempati, hoşnutluk, sıcaklık ve cömertlik hissetmemek, diğer insanlarla endişeli, çekingen ve utanç

hissetmek, sosyal etkileşimlere başlayamamak, kendine güven ve benlik saygısı düşüklüğü, inisiyatif alamama, sosyal olarak zorlayıcı durumlardan kaçınma gibi özelliklere sahip olmak sürücülerin trafikte ‘hata’ yapmalarına yol açmaktadır. Dahası, inisiyatif kullanamama, sosyal açıdan zorlayıcı durumlardan kaçınma, başkalarına 'hayır' diyememe, öfkeyi hissedememe ve ifade edememe, ikna etmesi ve aldatması kolay olma, fazla istekli olma, kendine güven ve benlik saygısının ciddi derecede düşük olması, sunmak için çok hazır, çok cömert, çok bakım veren, çok güvenen, çok izin veren olma ve ilişkilerde sınırları korumakta zorlanma gibi problemlere sahip olmak sürücülerin trafikte pozitif sürücü davranışları göstermesine yol açmaktadır. Ve son olarak ‘dikkatsizlikler ve ihmaller’ davranışlarının KAD modelinin merkezi noktasına yakın temsil edilmesi dikkat çekicidir. Bu konunun herhangi bir çeyreğin belirgin özelliklerine sahip olmadığı söylenebilir. Bu sebeple ihmaller ve dikkatsizlikler davranışlarının temsil edildiği noktaya bakılınca da döngüdeki temel özelliklerin hiçbirini tam olarak taşımadığı söylenebilir. Bu da dikkatsizlikler ve ihmallerin hafıza ve dikkat bozukluklarından kaynaklanmasının sonucu olabilmektedir.

#### Eleştirel Yorumlar

Bu çalışmanın bazı sınırlamaları bulunmaktadır. Öncelikle, veri toplama yöntemi öz değerlendirme yöntemi olduğu için bu yöntemdeki bazı cevaplar önyargı içerebilir ve katılımcılar toplumsal olarak istenen cevapları vermiş olabilir. Dahası, bu çalışmanın kesitsel niteliği, sebep-sonuç ilişkileri çıkarmakta güçlük yaratacağı için sorun olabilmektedir ve aynı zamanda bir süre zarfı içerisinde örneklemdeki değişiklikleri gözlemlene imkânı da bulunmamaktadır.

#### Çalışmanın Etkileri ve Gelecek Çalışmalar için Öneriler

Bu çalışmanın amacı, sürücü davranışlarının KAD modeli düzlemi üzerindeki temsillerini incelemek ve bu iki kavramı ilk kez bütünleştirmektir. Bildiğimiz kadarıyla bu çalışma, sürücü davranışları ile KAD modeli yapıları arasındaki ilişkiyi araştıran ilk çalışmadır. Gündelik sürücülük sadece teknik trafik durumlarından değil aynı zamanda teknik olmayan trafik dışı durumlardan da etkilenmektedir. Ayrıca, trafik ortamı sosyal hayattan bağımsız değildir. Sürücüler trafikte davranışları

aracılığı ile iletişim kurmaktadır ve tabii ki davranışları kişiler arası ilişkilerinden etkilenmektedir. Bu nedenle kişiler arası etkileşimler ve sürücü davranışları arasındaki ilişkiyi araştırmak önemlidir. Uygulama açısından sonuçlar, aşırı ihlal veya hata eğilimli sürücüler için müdahale programlarının hazırlanmasında, kişiler arası problem tiplerinin dikkate alınabileceğini göstermiştir. Dahası, sürücüler için kişiler arası ilişkilerde yaşanan problemlerin sürücülük davranışlarını etkilediğini öğrenmek, bu nedenle trafikte hareket halindeyken davranışlarını nasıl yöneteceklerinde yardımcı olabilecektir. BU çalışma kendi alanındaki ilk olduğu için; trafik ortamlarındaki kişiler arası sorunları araştırmak isteyen gelecekteki çalışmalar, bu çalışmayı bir referans çalışma olarak alabilir ve bulgularına dayanarak ek araştırmalar yapabilir. Bu çalışmada önerilen ilişkinin kanıtlanması sonradan gelecek çalışmalarda, bu çalışmanın incelenmemiş değişkenleri ile diğer araştırmalar üzerine odaklanılabilir.

## APPENDIX G

### TEZ FOTOKOPİSİ İZİN FORMU

#### ENSTİTÜ

Fen Bilimleri Enstitüsü	<input type="checkbox"/>
Sosyal Bilimler Enstitüsü	<input checked="" type="checkbox"/>
Uygulamalı Matematik Enstitüsü	<input type="checkbox"/>
Enformatik Enstitüsü	<input type="checkbox"/>
Deniz Bilimleri Enstitüsü	<input type="checkbox"/>

#### YAZARIN

Soyadı : Özer  
Adı : Özge  
Bölümü : Psikoloji

**TEZİN ADI** (İngilizce) : An Investigation of Driver Behaviors: Their Relationship with Interpersonal Problems and Representations on the Interpersonal Circumplex

**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 bir (1) yıl süreyle fotokopi alınamaz. ☒

**TEZİN KÜTÜPHANEYE TESLİM TARİHİ:**