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Sex Stereotypes of Adolescents in Traffic: The Role of Sex and Family Relationships

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Abstract

Studies have shown a number of differences between male and female drivers, such as male drivers committing more offenses and female drivers making more errors. Related to this persistent sex difference, relatively little research has been conducted to examine the presence of gender stereotypes and determinants in the context of driving. This study examined the perceptions of female and male drivers among adolescents in Türkiye and how sex differences and relationships with parents contributed to the endorsement of sex stereotypes. The study was conducted with 128 high school adolescents aged 15-20 years (M = 16.25, SD = 1.32) who completed a questionnaire package consisting of the Sex Stereotypes Associated with Driving (SSAD) and a demographic information form. In terms of sex stereotype endorsement indices, female adolescents reported female drivers as more polite and risk-averse, whereas male adolescents reported male drivers as more skilled. While a positive relationship with fathers reduced the endorsement of courtesy and risk-avoidance stereotypes, a better relationship with mothers resulted in a lower endorsement of the driving skills stereotype. The results provide evidence for the existence of sex stereotypes among adolescents and for the importance of family relationships in relation to sex stereotype endorsement. The findings can be used to design training and education that focuses on stereotypes at an early age.

Keywords: *sex stereotypes, driver stereotypes, adolescence, sex difference, parent-child relationship*

Trafikte Ergenlerin Cinsiyet Kalıp Yargıları: Cinsiyet ve Aile İlişkilerinin Rolü

Özet

Araştırmalar, erkek ve kadın sürücüler arasında, erkek sürücülerin daha fazla trafik cezası alması ve kadın sürücülerin daha fazla hata yapması gibi bir dizi farklılık olduğunu göstermektedir. Gözlemlenen bu cinsiyet farklılığına bağlı olarak, sürüş bağlamında toplumsal cinsiyet kalıp yargılarının ve belirleyicilerinin varlığını inceleyen nispeten az sayıda araştırma yapılmıştır. Bu çalışma, Türkiye'deki ergenlerin kadın ve erkek sürücü algılarını ve cinsiyet farklılıklarının ve ebeveynlerle ilişkilerin cinsiyet kalıp yargılarının onaylanmasına nasıl katkıda bulunduğunu incelemiştir. Çalışma, Sürücülükle İlişkili Cinsiyet Kalıp Yargıları (SSAD) ve demografik bilgi formundan oluşan bir anket paketini dolduran 15-20 yaş arası 128 lise çağındaki ergen (M = 16.25, SD = 1.32) ile yürütülmüştür. Cinsiyet stereotipi onay endeksleri açısından, kız ergenler kadın sürücüleri daha kibar ve riskten kaçınan olarak bildirirken, erkek ergenler erkek sürücüleri daha becerikli olarak bildirmiştir. Babalarla olumlu bir ilişki nezaket ve riskten kaçınma kalıp yargılarının onaylanmasını azaltırken, annelerle daha iyi bir ilişki sürüş becerileri kalıp yargısının daha az onaylanmasıyla sonuçlanmıştır. Sonuçlar, ergenler arasında cinsiyet kalıp yargılarının varlığına ve aile ilişkilerinin cinsiyet kalıp yargılarının onaylanması açısından önemine dair kanıtlar sunmaktadır. Bulgular, erken yaşta kalıp yargılara odaklanan eğitim ve müdahale çalışmalarının tasarlanmasında kullanılabilir.

Anahtar Kelimeler: cinsiyet kalıp yargıları, sürücü kalıp yargıları, ergenlik, cinsiyet farklılığı, ebeveyn-çocuk ilişkisi

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Sex Stereotypes of Adolescents in Traffic: The Role of Sex and Family Relationships

1.1. Sex Differences and Stereotypes in Road Safety Studies

Differences between male and female drivers have been studied in various aspects of driving. For example, in terms of crashes, national statistics in 2021 showed that 77.2% of those killed in road traffic crashes in Türkiye were males and 22.8% were females, while 70.5% of those injured were males and 29.5% were females (Türkiye İstatistik Kurumu (TÜİK), 2022). Another study in Australia using 13-year cohort data found significant sex differences in injury and crash statistics: while females were more likely than males to be involved in crashes requiring hospital treatment, males were more likely than females to be involved in all other types of crashes (Cullen et al., 2021). Laapotti and Keskinen (2004) examined the characteristics of road crashes in Finland in 1984 and 2000 and found that the differences between the characteristics of female and male drivers remained similar over the years. Male drivers, especially young male drivers, had more traffic violations and were involved in more crashes due to speeding and alcohol consumption in comparison to female drivers.

Crash involvement has been linked to many direct and indirect factors (Lajunen & Özkan, 2021). A driver's ability to drive has been investigated under two distinct components (Elander, West, & French, 1993); driver behaviors (style) and driver skills (performance); which are directly related to crash involvement (Lajunen & Özkan, 2021). Similar to the sex differences in crash involvement, significant differences were also observed in these two aspects of driving. For example, studies have reported that male drivers, especially young male drivers, showed aggressive and ordinary violations more (e.g., de Winter & Dodou, 2010; Öztürk & Öz, 2021; Reason, Manstead, Stradling, Baxter, & Campbell, 1990; Rowe, Roman, McKenna, Barker, & Poulter, 2014) while female drivers showed errors more (de Winter & Dodou, 2010; Guého, Granié, & Abric 2014). González-Iglesias, Gómez-Fraguela, & Luengo-Martín (2012) found that male drivers experienced more anger in case of a police presence, while female drivers became angrier in the presence of traffic obstructions. In another study conducted in Türkiye, Öztürk and Özkan (2018) found that young male drivers showed more positive driver behaviors and drove faster in the driving simulator compared to young female drivers. In addition, while most studies show limited sex differences in driving anger (Aktaş & Akgür, 2023; González-Iglesias et al., 2012), male drivers become angry due to police presence (González-Iglesias et al., 2012), use more aggressive forms of anger expression (Öztürk, Özkan, & Öz, 2021), and are more likely to become perpetrators of road rage (Aktaş & Akgür, 2023) compared to female drivers.

In addition to driver behaviors, several studies have reported sex differences between two dimensions of driver skills, namely perceptual-motor skills and safety skills (Lajunen & Summala, 1995; Martinussen, Møller, & Prato, 2014; Özkan & Lajunen, 2006). For example, while male drivers reported more perceptual-motor skills, female drivers showed more safety skills (Martinussen et al., 2014; Özkan & Lajunen, 2006).

Overall, significant differences were observed between male and female drivers in different components of driving. In general, González-Iglesias et al. (2012) summarised the difference between the two sexes as male drivers experiencing more accidents, fines, and traffic violations than female drivers. Concerning this general interpretation, it is not well known whether road users also perceive male and female drivers in a similar way and have certain stereotypes about one group over the other. Therefore, in a recent attempt to further understand sex stereotypes associated with driving, Pravossoudovitch, Martha, Cury, and Granié (2015) developed Sex Stereotypes Associated with Driving (SSAD), which examined the relationships of these stereotypes with age and gender. The SSAD endorsement focuses on sex stereotypes in four

dimensions; driver skills, compliance with traffic rules, courtesy behind the wheel, and risk avoidance (Pravossoudovitch et al., 2015). As a result of this work, sex differences were found for some dimensions of the SSAD evaluation of female and male drivers. For example, Pravossoudovitch et al. (2015) found that their male respondents rated female drivers' driving skills lower than female respondents, whereas female respondents rated female drivers' risk avoidance higher than male respondents did.

This recent examination of the sex stereotypes in driving may warrant a follow-up question about how and when these patterns start or take their final shape. Adolescence, the developmental phase where most adulthood characteristics take shape (National Academies of Sciences, Engineering, and Medicine, 2019), is possibly one of these time periods. With these questions and thoughts in mind, Granié and Papafava (2011) examined the SSAD for adolescent respondents and found that sex stereotypes for female and male drivers existed among adolescents between the ages of 10 and 16. For example, adolescents perceived female drivers to have relatively lower vehicle control abilities and higher accident rates, while they perceived male drivers as more skilled but also more careless and delinquent. The general understanding of these stereotypes can be summarized as female drivers being more compliant and males being more risk-taking.

In this context, the present study aimed to further investigate these sex stereotypes for female and male drivers with a sample of adolescents. Moreover, since family is the place where a child's growth and socialization begin (Acar, Pérez-González, Kutaka, & Yıldız., 2019), parents may be important agents in the development of sex stereotypes in adolescents. Therefore, this study has additionally considered parent-adolescent relationships with respect to sex stereotypes.

1.2. Adolescent Gender Perceptions and the Role of Parents

1.2.1. Adolescents and sex stereotypes.

Parents may influence a child's perceptions and actions in a few ways (Portengen, van Baar, & Endendijk, 2023): Firstly, directly by giving advice or setting limits to the child when the child engages in participatory learning (Odden & Rochat, 2004), and secondly, indirectly through the child's observation of the family members' perceptions and actions (referred to as *observational learning*; Bandura, 2008). These influences extend beyond childhood and continue, albeit to a lesser extent, into adolescence (Cakir & Aydin, 2005; Musaağaoğlu & Güre, 2005; Odden & Rochat, 2004).

One of these areas of influence is the adolescent's understanding of gender (Endendijk, Groeneveld, & Mesman, 2018). With the onset of adolescence, children begin to have more intensified gender roles (Işık-Baş, Şahin-Acar, & Özen-Çıplak, 2018). According to Berk (2010; as cited in Işık-Baş et al., 2018), this intensification, along with other factors, could be due to the physiological changes that the adolescent undergoes and the way the adolescent and the society respond to these changes by trying to fit the adolescent to their sex appearance, with this pressure being stronger in traditional families.

Similarly, parents' perceptions of adolescence and gender may shape their behaviors and reactions toward their adolescents, and in turn those adolescents' behaviors (Jacobs, Chhin, & Shaver, 2005; Sanson, Letcher, & Havighurst, 2018), but recent findings are mixed. For example, fathers are more likely to promote sadness and fear in girls and anger in boys (Sanson et al., 2018). Additionally, parents' conversations with their daughters are found to be more emotion-focused than conversations with their sons (Aznar & Tenenbaum, 2015), but a more recent meta-analysis has suggested that this differentiation is not strong for mother-child

interactions (Aznar & Tenenbaum, 2020). Similarly, in a meta-analysis, Endendijk, Groeneveld, Bakermans-Kranenburg, and Mesman (2016) found negligible differences regarding mothers' and fathers' differential treatment to their daughters and sons. Nevertheless, Endendijk and colleagues (2017) also found that fathers' (but not mothers') differential treatment and children's aggression levels were related when those fathers had strong stereotypical or egalitarian gender understanding.

One factor that may strengthen or weaken parental influence and the strength of socialization is the relationship between parents and adolescents. Parental influence on adolescents' thoughts and behavior may be relatively limited in comparison to peer influences (Agostinelli, Doepke, Sorrenti, & Zilibotti, 2020). However, there are studies that have demonstrated that parental influence on adolescents is still strong in factors such as achievement strategies, future beliefs, and even mental health (Aunola, Stattin, & Nurmi, 2000; Chen & Harris, 2019; Malmberg, Ehrman, & Lithén, 2005; Nurmi & Pulliainen, 1991).

1.2.2. Adolescents in traffic.

Transport is one of the areas in which parents can influence the socialization of children and young adults (Üzümcüoğlu, 2021; Öz, 2018). For example, studies (Bianchi & Summala, 2004; Taubman - Ben-Ari et al., 2005) found similarities between the driving styles of parents and their children. Here, adolescents' observation of their parents in traffic may also help to shape their understanding of the traffic rules and their place within them when they take on their parents' roles and become active participants in traffic in different roles. This possibility can be inferred from other studies which have demonstrated the influence of observing parents performing a task on the adolescents' performance on the same task. For example, Thomsen, Kappes, Schwerdt, Sander, and Poller (2017) had 7-12-year-old children observe their parents during a game and play the same game afterward. They found that parents' in-game decisions significantly impacted their children's in-game decisions. The same pattern is possible to be observed with in-traffic behaviors.

In this sense, it is possible to argue that the parent-adolescent relationship may also be an important factor in understanding adolescent perceptions, such as sex stereotypes they may have about driving. A strong parent-child relationship might set the ground for a better communication of parent perceptions to the child and strengthen the intergenerational transmission of sex stereotypes. On the other hand, a parent-child or parent-adolescent relationship that is perceived to have low quality may lead to a rejection of that parent's messages and a dismissal of their behaviors. Although children and young adults are involved in the traffic system at an early age (Öz, 2018; Üzümcüoğlu, 2021), and sex stereotypes in general have been found to be observed at early ages (Kågesten et al., 2016), there is limited research on sex stereotypes in the traffic environment with samples other than active drivers (e.g., Granié & Papafava, 2011). In particular, studies with children and young adults have focused on their driver behaviors (e.g., Elliott & Baughan, 2004; Taubman - Ben-Ari, Mikulincer, & Gillath, 2005; Scott-Parker, 2017) and travel modes and behaviors (e.g., Frater, Kuijer, & Kingham, 2017; Haustein, Klöckner, & Blöbaum, 2009; Mandic et al., 2016; Pojani, Van Acker, & Pojani, 2018). Consequently, knowledge on adolescents' traffic perceptions and how these perceptions might be shaped by their relationships is relatively limited. Therefore, another aim of the present study was to explore the role of the parent-child relationship in adolescents' perceptions of drivers.

1.3. The Aims of the Present Study

In light of the literature, this study was designed with two aims: to understand Turkish adolescents' perceptions of female and male drivers, and to explore whether sex differences

and adolescent-parent relationships were related to these perceptions. Additionally, it was thought that examining sex stereotypes associated with driving in Türkiye would provide a crucial contribution to the literature. Sex stereotypes in driving have been originally investigated in France. Türkiye and France are similar in terms of most cultural characteristics except for individualism and long-term orientation, with France being higher on both domains (Hofstede Insights, n.d.). Considering the Turkish literature that has demonstrated strong relationships between gender roles and different driving outcomes (Deniz, Lajunen, Özkan, & Gaygısız, 2021; Öztürk et al., 2021), presence of gender stereotypes in a number of contexts (e.g., Akdemir & Gölge, 2022; Basfirinci & Cilingir Uk, 2017; Sakallı Uğurlu, Türkoğlu, Kuzlak, & Gupta, 2021; Tarhan, 2022), and differences between male and female drivers in many driving outcomes (Aktaş & Akgür, 2023; Nordfjærn & Şimşekoğlu, 2014; Özkan & Lajunen, 2005; Öztürk & Öz, 2021), this study was thought to be relevant to the Turkish context.

To this end, the present study focuses on sex stereotypes among adolescents with the following research questions:

1) Do the perceptions of female and male drivers change as a function of adolescents' sex?
2) Is there a relationship between the quality of the relationship with parents and the perception of female and male drivers among adolescents?

2. Method

2.1. Participants

The study was conducted with a total of 128 high school students from a school in an urban neighborhood in Ankara, Türkiye. The students were aged between 15 and 20 years with a mean of 16.25 years (*SD* = 1.32). Thirty-two of the participants were male and 96 were female. Fifty-five point five per cent of the participants reported a total family income of 1500-3000 TL, 21.1% 1500 TL and below, 17.2% between 3000 and 5000 TL and the rest (6.2%) 5000 TL and above (Approximate minimum wage was 2400 TL at the time of data collection). The socio-economic status of the families is considered to be low-middle income considering the socio-economic structure of the region and the use of transport modes to the school.

2.2. Measurements

2.2.1. Sex stereotypes associated with driving (SSAD).

To measure the endorsement of sex stereotypes related to driving, Pravossoudovitch et al. (2015) developed a 27-item measure with four dimensions, namely compliance with traffic rules, driving skills, risk avoidance and courtesy. In the present study, a short version of the SSAD with 15 items was used (Pravossoudovitch, 2016). The short version consists of three items for compliance with traffic rules and four items for each of the other three factors. Responses are rated on a 7-point Likert scale ranging from 1 (not agree at all) to 7 (strongly agree). Participants were asked to evaluate female and male drivers for different components and to complete the survey for female and male drivers separately. The Turkish version was translated by Öztürk and Öz (under review). Each participants' ratings of male and female drivers were calculated separately for the four scores. Higher scores indicate a more positive evaluation of female/male drivers on that dimension. Then, stereotype endorsements for each dimension were calculated as an index (the index of compliance with traffic rules, driving skills, risk avoidance, and courtesy).

- *Female Drivers' Compliance with Traffic Rules Index* was calculated by subtracting the evaluation of female drivers' compliance score from male drivers' compliance score.
- *Male Drivers' Driving Skills Index* was calculated by subtracting participants' evaluation of male drivers' driving skills from female drivers' driving skills.
- *Female Drivers' Courtesy Index* was calculated by subtracting the evaluation of female drivers' courtesy score from male drivers' courtesy behind the wheel score.
- *Female Drivers' Risk Avoidance Index* was calculated by subtracting the evaluation of female drivers' risk avoidance score from male drivers' risk avoidance score.

Higher index scores indicated the participant's endorsement of sex stereotypes (i.e., males as more skillful and females as more courteous, compliant, and risk avoider), whereas negative scores meant the opposite relations (named as counter stereotypes – i.e., females as skillful, males as courteous, compliant, and risk avoider). The Cronbach's alpha reliabilities of female drivers were .85 for compliance with traffic rules, .91 for driving skills, .90 for courtesy and .92 for risk avoidance. The Cronbach's alpha reliabilities of male drivers were .69 for compliance with traffic rules, .85 for driving skills, .78 for courtesy, and .86 for risk avoidance, indicating that the measures had acceptable reliability values.

2.2.2. Adolescents' perception of the relationship quality with their parents.

We measured the relationship quality between the participants and their parents using a single-item self-report question (*How would you rate your relationship with your parents?*) for their mothers and fathers separately. Developed for this study, these two questions were rated on a scale of 0 to 10, with higher scores indicating better relationships. Single-item measures are often used in adolescence research with good correlations to longer self-report measures (e.g., Jovanović, 2016; Lukoševičiūtė et al., 2022) and in measuring parent-adolescent relationship quality (Hair et al., 2005). Given the exploratory nature of the study and the relatively low motivation of children and adolescents to participate in longer surveys, a single-item measure was thought to be a convenient method.

2.2.3. Demographic information form.

In the demographic information form, the participants were asked to indicate their sex and year of birth.

2.3. Procedure and Data Analysis

The present study was approved by the Human Subjects Ethics Committee of the Middle East Technical University with protocol number 050-ODTU-2020. Convenience and snowball sampling were used to reach the participants. To participate, students had to fill out an online survey prepared using Qualtrics. The survey link was distributed to the students via their teachers. Before starting the questionnaire, participants (and one of their parents if the participant was under 18) had to fill out one informed consent and one parental informed consent form (for those under 18). After giving consent, the participants completed the demographic information form. Following the demographic information form, participants filled out the SSAD for female drivers and the SSAD for male drivers in a counterbalanced order. After completing the questionnaire, participants were presented with a debriefing form.

Data were analyzed with SPSS v26 and JASP 0.14.1.0. After the tabulation of descriptive statistics and correlations, independent samples *t*-test analyses were conducted to examine sex differences in terms of eight scores and four indexes (four scores evaluating female drivers, four scores evaluating male drivers, and four indexes indicating stereotype endorsement). In

addition, following the suggestions of Field (2013), the skewness or kurtosis values for the variables were appropriate for the analysis. Since the number of female (N = 96) and male (N = 32) participants were disproportionately distributed in the sample, a subsample of the female participants was randomly selected to enable female-male comparison (N = 32). In the last step, four hierarchical regression analyses were conducted to examine the role of relationship quality with parents in four indexes separately. Age and gender were entered as control variables in the first step. Adolescent-mother and adolescent-father relationships were entered in the second step.

3. Results

3.1. Descriptives and Correlations

The means and standard deviations of the eight scores and four indexes (i.e., female compliance with speeding rules, female driving skills, female courtesy, female risk avoidance, male compliance with traffic rules, male driving skills, male courtesy, male risk avoidance, index of compliance with traffic rules, index of driving skills, index of courtesy, index of risk avoidance) and their bivariate correlation coefficients are presented in Table 1. According to the results, participant age was positively correlated with the index of driving skills and negatively correlated with female driving skills. The relation quality with fathers was positively correlated with male drivers' courtesy and risk avoidance, and with the index of compliance with traffic rules, and negatively correlated with the index of driving skills and the index of risk avoidance. While stereotype scores of female drivers and male drivers were positively correlated with the corresponding group, only the indexes that were related to female drivers (i.e., female compliance with traffic rules, driving skills, risk avoidance, and courtesy) were positively correlated with male driving skills.

3.3. Sex Differences among SSAD

According to the independent samples *t*-test results (see Table 2), there were significant sex differences in female driving skills, male compliance with traffic rules, male driving skills, male courtesy, index of driving skills, index of courtesy and index of risk avoidance.

In detail, female adolescents had a more positive image of female drivers in driving skills than male drivers. In terms of the evaluation of male drivers, male adolescents had a more positive image of male drivers on compliance with traffic rules, driver skills, courtesy and risk avoidance. In comparing stereotype endorsement scores (indexes) between females and males, male adolescents had a higher tendency to see male drivers as skilled drivers, and female adolescents had a higher tendency to rate female drivers as courteous and risk-avoiders.

3.4. The Association between Family Relationships and Sex Endorsement

In the final step, four hierarchical regression analyses were conducted to examine the role of relationship quality with parents in four indexes separately. In the first step, age and gender were entered as control variables. In the second step, relationships with fathers and mothers were entered (see Table 3).

The models were significant for the index of driver skills ($F(4, 120) = 11.82$, $p < .001$), the index of courtesy ($F(4, 120) = 4.63$, $p = .002$), and the index of risk avoidance ($F(4, 120) = 4.97$, $p < .001$) and not significant for the index of compliance with traffic rules ($F(4, 120) = 1.91$, $p = .113$). Relationship with mothers positively related to the index of driver skills (95% CI [-1.19, -.07]). Additionally, relationships with fathers were negatively related to the indexes of courtesy (95% CI [-1.16, -.07]) and risk avoidance (95% CI [-1.24, -.08]).

TUAD Trafik ve Ulaşım Araştırmaları Dergisi

Table 1. Descriptive statistics and correlation coefficients

	Age	R_Mo	R_Fa	F_CTR	F_DS	F_Co	F_RA	M_CTR	M_DS	M_Co	M_RA	I_CTR	I_DS	I_Co	I_RA
Age	1														
R_Mo	-.18*	1													
R_Fa	-.09	.37**	1												
F_CTR	-.09	.03	-.08	1											
F_DS	-.20*	.14	-.06	.60**	1										
F_Co	-.09	.02	-.14	.79**	.68**	1									
F_RA	-.14	.02	-.13	.85**	.58**	.84**	1								
M_CTR	.04	.11	.12	-.03	.04	.05	-.00	1							
M_DS	.01	.06	.16	.48**	.24**	.40**	.38**	.12	1						
M_Co	-.08	.16	.21*	.05	.11	.05	.04	.70**	.21*	1					
M_RA	-.01	.10	.21*	.06	.07	.05	.04	.65**	.27**	.79**	1				
I_CTR	-.09	-.08	.17*	.77**	.43**	.56**	.63**	-.66**	.29**	-.41**	-.37**	1			
I_DS	.18*	-.08	-.25**	-.14	-.67**	-.27**	-.21*	.06	.56**	.07	.14	-.15	1		
I_Co	-.02	-.05	-.14	.60**	.48**	.78**	.65**	-.40**	.20*	-.59**	-.46**	.71**	-.26**	1	
I_RA	-.10	-.04	-.23**	.61**	.40**	.61**	.75**	-.43**	.11	-.49**	-.64**	.74**	-.25**	.80**	1
M	16.25	8.48	7.73	15.72	17.93	20.92	21.20	9.88	19.94	14.07	14.14	5.84	2.00	6.85	7.05
SD	1.32	2.20	2.62	4.29	6.40	6.28	6.44	3.69	5.71	4.90	5.56	5.74	7.50	7.78	8.35

*Note. **p < .01, *p < .05. R_Mo: Relationship with mothers, R_Fa: Relationship with fathers, F_CTR: Female compliance with speeding rules, F_DS: Female driving skills, F_RA: Female risk avoidance, F_Co: Female courtesy, M_CTR: Male compliance with traffic rules, M_DS: Male driving skills, M_RA: Male risk avoidance, M_Co: Male courtesy, I_CTR: Index of compliance with traffic rules, I_DS: Index of driving skills, I_Co: Index of courtesy, I_RA: Index of risk avoidance.*

Table 2. Sex differences in terms of the SSAD dimensions

	Female		Male		*df*	*t*	*p*
	M	*SD*	*M*	*SD*			
F_CTR	15.59	4.88	15.30	4.28	62	-.26	.799
F_DS	18.37	6.46	13.87	6.40	62	-2.80	.007
F_Co	21.49	7.00	18.70	6.71	62	-1.63	.109
F_RA	21.56	6.88	19.61	7.13	62	-1.11	.271
M_CTR	9.39	3.49	11.72	4.08	62	2.46	.017
M_DS	18.27	6.09	22.20	5.13	62	2.79	.007
M_Co	13.47	4.42	15.94	5.26	62	2.03	.046
M_RA	13.22	4.60	17.07	5.51	62	3.04	.003
I_CTR	6.21	5.93	3.58	5.96	62	-1.77	.082
I_DS	-.10	7.01	8.34	8.05	62	4.47	.000
I_RA	8.34	8.05	2.54	9.56	62	-2.63	.011
I_Co	8.02	8.05	2.76	8.39	62	-2.56	.013

Note. F_CTR: Female compliance with speeding rules, F_DS: Female driving skills, F_Co: Female courtesy, F_RA: Female risk avoidance, M_CTR: Male compliance with traffic rules, M_DS: Male driving skills, M_RA: Male risk avoidance, M_Co: Male courtesy, I_CSR: Index of compliance with traffic rules, I_DS: Index of driving skills, I_Co: Index of courtesy, I_RA: Index of risk avoidance.

4. Discussion

The present study, to best of our knowledge, was the first in the literature to examine the sex stereotypes associated with female and male drivers among Turkish adolescents. In addition to examining the presence of stereotypes among adolescents with SSAD, sex differences and relationships with mothers and fathers were also examined.

Concerning the first research question "*Do the perceptions of female and male drivers change as a function of adolescents' sex?*", similar to the sex differences in previous studies with other age groups (Pravossoudovitch et al., 2015), sex stereotypes with respect to male and female drivers were observed in both male and female adolescents. Male adolescents evaluated female drivers as less skillful and male drivers as more compliant with traffic rules, more skilled, risk-avoiding, and courteous than female adolescents. Looking at the indexes, male adolescents rated male drivers as more skilled, whereas female adolescents confirmed the stereotypes of female drivers as being more courteous and risk-avoiders.

The results showed that the largest differences in sex stereotypes were observed in driver skills and towards male drivers. It is particularly interesting to note that while female adolescents showed more neutral sex stereotypes in terms of driver skills (i.e., they rated the level of driver skills of female and male drivers at approximately the same level with an index value of -.10), male adolescents exhibited a strong sex endorsement on driver skills. The pairwise comparisons and the index of driver skills showed that male adolescents tended to see male drivers as more skillful and female drivers as less skilled. In other words, male adolescents seemed to show a strong in-group endorsement of driver skills, which may also be related to young male drivers'

Table 3. Relations between parent-child relationships and driving outcomes

	Index of Compliance						Index of Driver Skills					
	R^2	$R^2\Delta$	*df*	$F\Delta$	β	*p*	R^2	$R^2\Delta$	*df*	$F\Delta$	β	*p*
1st Step: Demographics	.05	.05	2, 122	3.21		.044	.25	.25	2, 122	19.94		<.001
Age					-.035	.699					.06	.463
Gender (0: Male, 1: Female)					.212	.022					-.478	<.001
2nd Step: Relationship	.06	.01	2, 120	.63		.536	.28	.04	2, 120	3.04		.052
with mother					.013	.896					-.187	.028
with father					-.105	.276					.146	.084
	Index of Courtesy						Index of Risk Avoidance					
	R^2	$R^2\Delta$	*df*	$F\Delta$	β	*p*	R^2	$R^2\Delta$	*df*	$F\Delta$	β	*p*
1st Step: Demographics	.1	.1	2, 122	6.48		.002	0.11	0.11	2, 122	7.26		.001
Age					.063	.482					-.012	.893
Gender (0: Male, 1: Female)					.320	<.001					.323	<.001
2nd Step: Relationship	.13	.04	2, 120	2.6		.078	0.14	0.04	2, 120	2.51		.086
with mother					.033	.720					.054	.557
with father					-.207	.027					-.205	.027

TUAD Trafik ve Ulaşım Araştırmaları Dergisi

overestimation of driver skills when they are older. Likewise, different studies have provided evidence of the overestimation of driver skills of young drivers, especially young male drivers (i.e., de Craen, Twisk, Hagenzieker, Elffers, & Brookhuis, 2011; Martinussen, Møller, & Prato, 2017). Although de Craen et al. (2011) discussed that novice drivers were aware of their skill level compared to average drivers, male adolescents seemed to evaluate male drivers as more skilled compared to female drivers. Considering that these male adolescents may become novice drivers in a few months or years, the overestimation of driver skills of their own sex group may also be reflected in their estimation of their own driver skills in the future.

In line with the previous findings of Granié and Papafava (2011), female drivers were associated with more feminine characteristics and evaluated as less skilled and safe, but male drivers were evaluated as more skilled and more risk-taking, which could be linked to being more masculine in the driving context. It could be discussed that, in Türkiye, driving is a mostly male-dominant area, and different studies in the literature associated being a skilled and a good driver with having more technical driver skills (i.e., perceptual-motor skills) and a component of masculine features (i.e., Granié & Papafava, 2011; Özkan & Lajunen, 2006). Furthermore, risk avoidance, which was rated higher for female drivers, could also be interpreted as a characteristic of a safe driver, which is associated with safety skills and feminine characteristics (Özkan & Lajunen, 2006). In this respect, it could be argued that female and male adolescents reflected a masculine-feminine role differentiation in terms of indexes of the SSAD.

The results could be interpreted as the need for efforts to understand and intervene in driver behaviors to start as early as adolescence, and perhaps even earlier, since children are socialized about sex roles starting from an early age, especially in terms of what is considered masculine (Solbes-Canales, Valverde-Montesino, & Herranz-Hernández, 2020). There is a higher degree of stereotyping of masculine traits and professions than of feminine traits, and fathers and sons are more alike in gender role attitudes than any other dyads in nuclear families (Kulik, 2002), making boys prone to have stricter attitudes about masculine traits. Likewise, these results demonstrated stronger sex differences among adolescents regarding male drivers, with male adolescents showing higher levels of sex stereotyping.

In addition, according to the literature, girls are rewarded more for their prosocial behaviors by mothers compared to boys (Hastings, McShane, Parker, & Ladha, 2007), and boys are warned and tolerated more for their risky behaviors (Morrongiello & Hogg, 2004). In line with this differential rewarding, the adolescents in this study, especially females, attributed more courteous driving characteristics to female drivers and more risk-taking characteristics to male drivers. Hence, the present study's results might be related to early-start socialization practices, with the adolescents having applied what they learned about gender differences through various means of socialization like observation or lecturing from their parents. As a result, this may lead to an understanding of sex role that is generalized to drivers and driving in the following years of life. This pattern has been observed in several areas related to adolescent development, like the gendered division of housework, and career- and peer-choices of adolescents (Endendijk et al., 2018).

In addition to the presence of sex stereotypes and the sex differences in SSAD, we also examined another research question "*Is there a relationship between the quality of the relationship with parents and the perception of female and male drivers among adolescents?*". The results provided two significant patterns highlighting the importance of parent-adolescent relationships on attitudes toward drivers: Adolescents who reported a more negative relationship with their mothers showed stronger sex stereotypes on the index of driver skills, and positive relationships with fathers were negatively associated with the indexes of courtesy and risk avoidance. As discussed earlier, driver skills are seemingly associated with masculine

characteristics, whereas courtesy and risk avoidance are perceived as a factor of feminine characteristics. According to the results, the adolescents' positive perceptions of the parent-adolescent relationship seemed to counteract these traditional sex stereotypes. Therefore, the relationship quality with the opposite-sex parent could play a protective role against developing strict sex stereotypes (i.e., mothers for driver skills and fathers for courtesy and risk avoidance). This protective role could be partly explained by the fact that increased familiarity with a group decreases stereotypes against them (Steiger et al., 2022), and counting someone as an "ingroup member" leads to the promotion of their skills and abilities (Hinde & Stevenson-Hinde, 1987). A better parent-adolescent relationship might lead to increased familiarity with and a higher chance to observe the parent in question, which would decrease the need to divert to automatic generalizations (i.e., stereotypes) in defining who they are. Similarly, parents may pose as a counterexample to sex stereotypes, which would then lead to an increased awareness of the driving behaviors and skills of others belonging to the same identity group as the parent in question. This, in return, would lead to a new schema being formed around those individuals. More studies are needed to further examine these associations.

Given the aforementioned similarities and differences of the findings with previous studies conducted in France (Granié & Papafava, 2011; Pravossoudovitch et al., 2015) and overlap with studies on gender stereotypes in Türkiye (e.g., Akdemir & Gölge, 2022; Basfirinci & Cilingir Uk, 2017; Sakallı Uğurlu et al., 2021; Tarhan, 2022), this study can be considered as a sign of the existence of sex stereotypes in other traffic systems outside of France, and could further suggest that the demonstrated patterns may be observed in other countries as well. We believe that the findings of the current study provide a number of research angles that could contribute to traffic safety research and practice. Further investigation of sex stereotypes in traffic contexts across different cultures may be warranted.

4.1 Limitations, Future Suggestions, and Implications

A number of critical points should be made about the design and results of the current study. Firstly, although the sample size was sufficient for sex comparisons and correlation tests, it was also relatively small for making conclusive interpretations for adolescents. The present study presents rather descriptive findings and should be considered as preliminary data regarding the development of sex stereotypes related to driving, especially among adolescents. We encourage further analysis with a larger sample to examine the interaction effects between child sex and parent sex when considering the impact of relationship quality with parents. Adolescents' perceived relationship quality was examined with a single-item question to increase convenience. Nevertheless, the single-item measure of relationship quality may have limited power to provide detailed information on different aspects of the adolescents' relationship with their parents. Future studies should take this into account when investigating the role of parent-child relationships. Future experimental studies might help further understand the components of adolescents' judgments when evaluating different drivers.

The fact that there are no age differences in the analyses, or that age does not show a significant effect in the regression analysis, may be because the sample by nature consists of a limited age range. For example, in the previous study conducted by Pravossoudovitch et al. (2015), some differences were found between three age groups (18-24, 25-44, 45-64). With this in mind, examining the results of the current study with different (earlier and later) age groups might provide more contextual information. This would allow the investigation of the potential effects of different factors, such as exposure to different driving conditions and individual experiences, which may later be examined in relation to these stereotypes. Similarly, socio-economic status (SES) may play a role in the context of the current study. SES is usually demonstrated to have a moderating role in the development of stereotypes in childhood (e.g., Coyne, Linder, Booth,

Keenan-Kroff, Shawcroft, & Yang, 2021), but may have a more complex presentation than imagined (e.g., boys and girls may be affected by SES differently, as in del Río, Strasser, Cvencek, Susperreguy, & Meltzoff, 2019), or may not be effective at all in some circumstances (e.g., del Río et al., 2021). Therefore, children from different socio-economic backgrounds may exhibit different characteristics in terms of driving stereotypes. We recommend further investigation of the interaction of sex and socio-economic status in the context of sex stereotypes associated with driving with a bigger sample.

Nevertheless, the findings of the present study suggest an area for future research and intervention with adolescents that focuses on sex stereotypes in relation to driving. For example, although the results indicated sex differences in adolescents' evaluations of female and male drivers using a self-report measure, it would be equally valuable to further investigate sex stereotypes using implicit measures (e.g., Guizzo, Moè, Cadinu, & Bertolli, 2019; Morrissey, Hallett, Bakhtiar, & Fitzpatrick, 2019). Moreover, Halpern and Perry-Jenkins (2016) found that parents' behaviors were more influential than their beliefs in shaping their children's attitudes towards sex roles. Therefore, it would be valuable to explore not only the adolescents', but also their parents' sex stereotypes and the mechanisms of their direct or indirect transmission, a need also addressed by Endendijk et al. (2018). Another potential area of focus for future researchers could be how adolescents with different gender identities would perceive sex stereotypes related to driving, and the ways their driver perceptions converge and diverge with adolescents whose genders align with the binary common sense.

In general, as a vulnerable road user group in the traffic system, children and adolescents are of great importance and have been the subject of extensive intervention studies in many places (see Öz, 2018 for more details). In this respect, they play an active role in the traffic system with many different roles (passengers, pedestrians, cyclists, etc.) which results in observations and many interactions with other road users. Bearing in mind that the development of stereotypes about female and male drivers may occur at a younger age before they become drivers, training and education programs that inform young road users about these stereotypes may prevent both the emergence of stereotypes and unsafe interactions with and expectations of male or female drivers in traffic. For example, Moè, Cadinu, and Maass (2015) found that female drivers performed worse when they knew their driving skills were being evaluated and compared to male drivers, and performed better when they were not reminded of stereotypes. Intervention programs aimed at reducing sex stereotypes about female and male drivers may contribute to overall road safety by supporting female drivers and reducing potential conflicts between female and male drivers.

5. Conclusion

In conclusion, the present study investigated the existence of sex stereotypes towards female and male drivers among Turkish adolescents and their relationships with mothers and fathers. The adolescents' perceptions were consistent with masculine and feminine role differentiations. Furthermore, the quality of the relationship with the parents also influenced the stereotype endorsement of the adolescents. Overall, the results of the present study indicated the existence of sex stereotype endorsement among adolescents, which changes as a function of sex and relationships with mothers and fathers. These findings also demonstrate the powerful influence of the parent-adolescent relationship on yet another aspect of adolescent development and socialization. The findings encourage further research into the developmental and family aspects and their dynamic relationships in the context of traffic and transport.

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Data access statement

The data supporting the results of this study are available on request from the corresponding author.

Ethics Committee Approval Statement

Ethics committee approval of the study was obtained from METU Human Research Ethics Committee (050-ODTU-2020).

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