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Stereotype threat: Effects on Women driving self-evaluation moderated by Menstrual Cycle

Stereotip tehdidi: Menstrual döngü moderasyonu ile araba sürüş öz değerlendirmesi üzerindeki etkileri

Tolga ERDOĞAN
tolga.erdogan@bilgedu.net, Istanbul/Turkey,
ORCID: 000-0002-8141-8569

Beyza KÖSEOĞLU
beyza.koseoglu@bilgiedu.net, Istanbul/Turkey,
ORCID: 0000-0002-5291-9903

Assist. Prof. Dr. Gergely CZUKOR
Istanbul Bilgi University, Faculty of Social Sciences and Humanities, Department of Psychology, gergely.czukor@bilgi.edu.tr, Istanbul/Turkey,
ORCID:0000-0002-3726-6780

ABSTRACT

This study investigated the moderating role of menstrual cycle in the relationship between gender stereotype salience and women's self-perceptions in terms of driving self-esteem and, stress and tension among 130 Turkish females. The study used a 2 (Stereotype salience: experimental or control) X 2 (Menstruation cycle: Menstruation period, or absence of period) experimental design. In phase 1, participants completed a survey to forecast the dates of their coming menstrual period. In Phase 2, based on the anticipated menstruation dates, participants were assigned randomly into experimental or control condition. In the experimental condition, participants were exposed to a gender laden car advertisement associating males with a sport car and females with a smaller, round-shaped automobile. In the control condition, the participants were not exposed to any gender and driving information. The results indicated that stereotype type salience single-handedly did not have a negative impact. However, stereotype salience and menstrual cycle had a significant interaction on both outcome variables. For participants who reported having a menstrual period, in the stereotype salience condition, stress and tension was higher, and self-esteem was lower as compared to the control condition. Both effects approached a large effect size. The effects were no significant for those without their period. The study draws attention to the important role of menstrual cycle as a magnifier of stereotype threat effects among female drivers.

Keywords: Stereotype Threat, Women Driving, Menstruation Cycle, Driving Self-Esteem, Stress and Tension

ÖZET

Bu çalışmada, cinsiyet stereotip tehdidinin kadınların araba sürüş özgüveni ve araba sürüş stres ve gerginliği arasındaki ilişki, menstrual döngü moderasyonu ile 130 Türkiyeli kadın üzerinde incelenmiştir. Çalışmada 2 (stereotip var/yok: deney veya kontrol grubu) x2 (Adet döngüsü: adet döneminde veya değil) deney tasarımı kullanılmıştır. 1. aşamada katılımcılar gelecek adet dönemlerinin tarihlerinin tahmin edilebilmesi için bir anket doldurmuşlardır. 2. aşamada katılımcılar öngörülen adet tarihlerine göre rastgele kontrol veya deneysel gruplara atanmışlardır. Deneysel koşulda katılımcılar, erkekleri bir spor otomobil ile ve kadınları daha küçük, yuvarlak şekillere sahip bir otomobil ile ilişkilendirilen araba sürüş ile ilgili stereotip tehdidi içeren bir araba reklamına maruz bırakılmışlardır. Kontrol koşulunda ise katılımcılar herhangi bir stereotip tehdidi içeren bir araba reklamına maruz bırakılmamışlardır. Sonuçlar tek başına stereotip tehdidinin bağımlı değişkenler üzerinde olumsuz bir etkisi olmadığını göstermiştir. Bununla birlikte, stereotip tehdidinin varlığının ve menstrual döngünün, her iki durumda da önemli bir etkileşime sahip olduğu görülmüştür. Adet döneminde olduğunu bildiren katılımcılar için stereotip tehdidi içeren durumda araba sürüş ile ilgili stres ve gerginliğinin daha yüksek, araba sürüş ile ilgili özgüveninin de kontrol durumuna göre daha düşük olduğu tespit edilmiştir. Her iki etki de büyük etki boyutuna ulaşmıştır. Çalışma, kadın sürücüler ile ilgili klişe stereotip tehditlerin etkilerinin güçlendiricisi olarak adet döngüsünün önemli rolüne dikkat çekiyor.

Anahtar Kelimeler: Stereotip Tehdidi, Kadın Araba Sürüşü, Menstrual Döngü, Araba Sürüş Özgüveni, Stres ve Gerginlik.

1. INTRODUCTION

Drawing one's attention to adverse generalized characteristics about one's social group leads to the salience of negative in-group stereotypes. Such stereotype salience can be particularly harmful when members of the targeted groups perform a task on a stereotyped performance domain, in which their group is negatively viewed (Steele & Aronson, 1995). Such situations can lead to self-categorization based on the negatively stereotyped in-group identity, which can induce a self-evaluative and situational threat, referred to as stereotype threat (ST; Steele & Aronson, 1995). ST is one's fear of confirming the negative stereotype and giving credence to negative views about one's in-group. Targets are affected by this threat due to their fear of negative judgments about their social group hence they are motivated to avoid underperformance to save the reputation of their group (Block et al., 2011). If one perceives that his or her in-group (i.e., ethnicity, race, gender, etc.) is under scrutiny in a stereotyped context, such cognition will potentially evoke ST (Ward & Buscombe, 2019). Hence, ST is situational and can be triggered in response to hints or cues that exist in the immediate environment (Steele, et al., 2002). It is argued that members of stigmatized minority groups may underperform their skills on stereotyped tasks, such as African Americans tend to underperform in SAT tests in America. ST can be applicable to any groups that in a given context negatively compare with some outgroup, hence it can vary across times, settings and context (Steele, et al., 2002).

Stereotype threat can have two main negative consequences. First, as mentioned above, as targets are motivated to make a positive reflection about their in-group, their enhanced effort, ironically, can interfere with their capacity to perform according to their best ability, leading to underachievement due to the heightened arousal (O'Brien & Crandall, 2003). For example, women exposed to stereotype threat manipulations achieve higher scores on an easy mathematics test as compared to a control condition. However, this performance trend reverses in more challenging mathematics tests (O'Brien & Crandall, 2003). ST can have such effects in many stereotyped performance dimensions besides math (O'Brien & Crandall, 2003; Spencer, et al., 1999), including spatial tasks (Moè, 2011), sports (Ward & Buscombe, 2019), cognitive tasks (Wister, et al., 2012), adopted type of communication style (von Hippel et al., 2011) and leadership self-perceptions (Hoyt et al., 2010). An additional implication of ST refers to negative self-perceptions with regards to one's perceived ability and fit, leading targeted individuals to disidentify with the domain. These negative self-perceptions have implications for targeted individuals' career choices, such as women avoiding leadership roles (Davies et al., 2005) or African Americans dropping out of college courses requiring strong verbal ability (Steele & Aronson, 1995).

1.1. Stereotype threat and driving

One of the most common negative stereotypes in the globe is related with women's vehicle driving skills (Moe, et al., 2015). The negative stereotype about women drivers stems from people's tendency to attribute hesitant and overcautious behaviors to women (Moe, et al., 2015). Although negative stereotypes about women's driving skills are widespread and strongly held, only few studies have examined women's driving performance or driving related self-perceptions in response to negative stereotypes (Granie & Papafava, 2011). One such study indicates that when women were induced to experience ST elicited by experimentally manipulated instructions in a driving simulator task, they were more likely to collide with jaywalkers and to make additional errors (Yeung & Hippel, 2008). These findings suggest that women's driving performance can be impaired in emergencies if they face ST.

1.2. Stereotype threat and driving: a Turkish context

In Turkey, corresponding with other countries, gender and driving has not received extensive research attention. However, conservatism in Turkey induces inequitable societal attitudes toward women (Çavdar & Yaşar, 2019), hence the implications of gender stereotypes on women's driving

self-perceptions may bear negative consequences. Conservatism in Turkey branches into four different themes, including religion, sexuality, traditionalism, and gender relations. The most common attitude held by society is sexual conservatism (Yılmaz, 2008). Sexual conservatism regulates sexuality and women's rights, their private life, and male-female relations in family life (Yılmaz, 2008).

These negative views about women's driving ability and prejudice toward female drivers have been confirmed in empirical research, investigating the content of gender-based stereotypes about driving in Turkey (Erol & Işık, 2015). It was found that omission errors generally are attributed to women drivers, whereas violation errors are more likely to be attributed to male drivers. It is suggested that stereotypically, women are believed to have lower spatial ability as compared to males, thus negative stereotypes about women drivers are related particularly with parking and maneuvering skills.

Corresponding to the content of gender stereotypes about driving, Turkish women, as compared to their male counterparts, have been found to have high levels of stress and tension as demonstrated by research investigating gender differences using the Driving Behavior Profile Inventory (DBPI) in Turkey (Yasak & Yiğit Işık, 1997). Stress and tension indicate the level of distress one is experiencing while driving a vehicle. In fact, driving performance is affected by psychological states, such as stress and tension. For example, stress, besides self-esteem, mediates the relationship between ADHD and driving performance (Turel & Bechara, 2016). Further, high traffic congestion leads to higher stress levels and this type of stress is a predictor of poor driving behavior in traffic (Hennessy & Wiesenthal, 1999).

The reviewed literature points to the abundance of negative stereotypes about female drivers in Turkey and Turkish women's internalization of those stereotypes, suggesting that stereotype threat can be a potential concern. We test whether gender-based stereotype salience is associated with lower driving self-esteem (Hypothesis 1_a), and higher stress and tension (Hypothesis 1_b) in women as compared to a control condition, in which the stereotype is not made salient.

1.3. Menstrual Cycle as a Moderator

Many studies have been dedicated to investigating moderators of stereotype threat effects, suggesting that factors within the person or the context can modify vulnerability, as these moderators can limit or enhance the pertinence of the stereotype to the targeted individuals. Identification with the negatively stereotyped group (Kang & Chasteen, 2009), identification with the stereotyped domain (Lewis & Michalak, 2018), working memory capacity (Beilock, et al., 2007), stigma consciousnes (Johnston-Robledo & Chrisler, 2011), test difference (Weis et al., 2019) and solo-status (Hoyt et al., 2010) have been demonstrated to qualify the extent to which individuals show stereotype threat effects, such as performance deterioation or domain disidentificaiton. In the present research, we aim to contribute to this research literature by focusing on a less psychological or contextual perspective, but more of a physiological mechanism. Specifically, we investigate the role of menstrual cycle as a moderator in the relationship between stereotype salience and women's driving-related self-evaluations.

Anthropologically, menstruation is a feared and disgusted taboo, which can lead to the devaluation of women. For example, experimental social psychology research demonstrated that a woman confederate was negatively evaluated by participants when in public, seemingly by accident, dropped a tampon as compared to when she dropped a hair clip (Roberts, et al., 2002). Not only the social environment indicates adversity, but women also tend to physically dislike, and indicate negative attitudes and emotions toward themselves when menstruating. These emotions include disgust and shame to their body and own menstrual cycles (Roberts, 2004).

In fact, menstruation can be viewed as a stigma for women. Research indicates that merely reminding women the subject of menstruation can trigger stereotype threat effects and diminish their cognitive ability (Wister, et al., 2012). Their study incorporated two predictors hypothesized to affect the cognitive performance of women participants (i.e., a Stroop task and short SAT-like math test) including a reminder of their menstruation (menstruation threat) and a positive priming about their menstrual cycle (positive prime). The findings were surprising in the manner that even the positive prime invoked negative thoughts. Thus, the group with positive prime and menstruation threat accumulated the lowest score both in SAT and Stroop task whereas the no-threat and no-positive prime group accumulated the highest score both in SAT and Stroop task. (Wister, et al., 2012).

Based on the stigmatic psychological implications of menstruation for women, we believe that having a menstrual period can increase the applicability of the female driving-performance stereotypes to targeted women. Accordingly, we predict that the salience of gender stereotypes and menstruation cycle will show an interaction effect: We hypothesize (Hypothesis 2) that the adverse impact of stereotype salience on driving self-esteem and, stress and tension will be heightened when participants report having a period or experiencing the related symptoms, relative to the absence of menstruation and its symptoms.

1.4. The present research

Using a Turkish sample, we aim to contribute to the literature on stereotype threat and driving by elaborating more closely on the effect of stereotyping on women's self-perceptions, including self-esteem and, stress and tension as outcome variables. Furthermore, we intend to draw attention to menstruation cycle, an under-researched aspect of womanhood in the stereotype threat literature and examine its potential moderating role in the relationship between gender stereotype salience and women's driving self-perceptions. In the followings, we report our experimental research, in which we manipulated stereotype salience, and investigated its effect on self-esteem and, stress and tension among Turkish female participants, who reported of having or not having their menstrual period.

2. METHODS

2.1. Participants and Design

A total of 210 women responded to a pre-screening survey (phase 1), out of which 130 continued to participate in the experiment (phase 2). A large portion of the sample, recruited by convenience sampling consisted of Istanbul Bilgi University students (n=156), the remaining participants (n=54) were recruited by snowball sampling technique. Participation was voluntary. Sixty-nine participants were in the control condition, 61 were in the stereotype salience condition. In the control condition, 50 of them were not on their period whereas 19 of them were on their period while completing the survey. For the stereotype condition, 40 participants were not on their period, and 21 were on their period. Participant's age (M = 22.35, SD = 4.39) ranged from 19 to 50. In the control condition, 55 of the participants had a driving license whereas 14 did not. As for stereotype salience conditions, 45 of them had driving license whereas 16 did not. A 2x2 experimental design was used with stereotype salience (salience or control) as independent variable, menstrual period (having or not having a period as moderator) as moderator; and driving self-esteem and, stress and tension were used as dependent variables. Having or not having a driver's license was used as a control variable.

2.2. Procedure

This study consisted of two phases. In Phase 1, participants completed an online survey, which included informed consent, demographic form, health survey, and MHQ. The key objective of

phase 1 was to obtain menstrual cycle date information from the participants to forecast their next menstrual date of period. To avoid drawing specific attention to menstruation and to eliminate participants' suspicion with regards to the actual purpose of the survey in Phase 1, the menstrual cycle items were placed in-between some general health-related questions that otherwise were not relevant for the study.

Phase 2 was also completed in the online survey tool. Separate web-links for the control and the experimental condition were used. In the control condition, participants completed the items for the two dependent variables. In the stereotype salience condition, first, participants were exposed to the experimental manipulation, then completed the dependent items. The web links were distributed by mail or personal phone, as preferred by participants in the Phase 1 survey. For menstrual cycle, our aim was to create a balance between the stereotype and control condition in terms of the number of participants with or without menstrual period.

Based on the expected date of period indicated in Phase 1, we arranged experiment participation dates in our attempt to create a balanced sample in terms of having or not having a period, across the control and experimental conditions. Hence, we matched participants based on their forecasted data for each occasion of data collection. The distribution dates were based on predicted menstrual period dates. After making a forecast of the next menstrual period, participants were randomly assigned into either control or stereotype threat condition. In these two conditions, participants were either on their menstrual period or not. As a further check for menstruation, at the completion of Phase 2, participants were requested to indicate if they were having a menstrual period or not. To avoid priming participants about the menstrual period, the menstrual cycle questions were placed in-between other, health-related items. As data collection were completed and the distribution of surveys closed, participants were sent a debriefing form via the communication channels they preferred in the Phase 1 survey.

2.3. Measures

2.3.1. Stereotype threat manipulations. Stereotype salience was manipulated by an old, car advertisement, involving two types of cars; a chiseled, sport car which was shown to belong to a young man, whereas a round-shaped, smaller automobile was displayed to be owned by a young woman. Both individuals displayed gender-typed gestures as they marveled their chosen vehicles: The man somehow conveyed that his car was a symbol of his success, while the woman expressed gratitude. We considered that the type of vehicles and the associated behaviors displayed in the ad would raise stereotype salience for our participants and invoke stereotype threat experience in terms of self-perceptions in driving. Five manipulation check questions following the stereotype threat manipulations were asked, e.g., what was the model of the car that belonged to the man/woman, what was the most attractive side of the car that belonged to the man/woman, what is the correct array of colors on the car emblem. These questions were multiple choice, basic questions that were aimed to detect whether participants gave attention to the poster thus gender-laden elements of the ad.

2.3.2. Health survey. In Phase 1, four general health-related questions (Çapık, 2006) were used to hide the menstruation questions items to avoid participants' suspicion that the survey exclusively targeted learning their menstrual cycle dates. The health survey consisted of 7 questions, e.g., how is your health conditions when you evaluate in general; do you smoke; do you have a chronic disease diagnosed by a doctor. The items from the health survey were not used for analysis.

2.3.3. Menstruation history questionnaire (MHQ). The Menstruation History Questionnaire was used (Yaghjyan et. al., 2012) in Phase 1. The original survey was designed to assess and characterize medications taken by participants. We excluded items that were related to surgeries and medication. We used six questions, e.g., *When was your first menstruation*? *When was your last*

period? When is your next -expected- period? These items were aimed to identify when the participants had their menstrual period the last time and when they expected their next period.

2.3.4. The Driving Self-Esteem. scale is based on the original version of the Rosenberg Self-Esteem Scale (Rosenberg,1965). This is a four-point Likert-scale with answer options ranging from strongly agree to strongly disagree, consisting of 10 items. The Driving Self-Esteem Scale contains 6 questions, e.g., I am satisfied with my driving; I am able to drive as well as other drivers; sometimes I think I am not good at driving, taken from the Rosenberg Self-Esteem Scale. The items which were not applicable to driving were excluded (including items 5, 6, 7 and 8, from the original Rosenberg Self-Esteem Scale). We adapted questions to Turkish via translation-back translation and the original items were appropriately reworded to measure driving self-esteem. We retained the original four-point Likert-scale. These six items proved to be a reliable scale (α =90); high scores indicate high driving self-esteem.

2.3.5. Stress and Tension. The "Stress and Tension" sub-scale of the Driver Behavior Profile Inventory DBPI (Yasak & Yiğit-Işık, 1997) was used, measured in a six-point Likert scale. This subscale consists of 8 questions, e.g., driving makes me feel uneasy; I feel good while I am driving; other drivers warn me with their horns and headlights, with a six-point Likert scale, ranging from 1(strongly agree) to 6 (strongly disagree). All questions are used in this research translated and back-translated in Turkish. Translated version of the inventory have a Cronbach's Alpha as .76. High scores indicated higher stress and tension.

2.3.6. Menstruation check. One check question was used for assessing the menstruation condition of the participant at the end of the second phase of the study. It had five options, e.g., How would you describe your current physical health; how would you describe your current psychological health; did you have any headache in last 24 hours, to indicate the extent to which participants for checking whether the participant was on her period or not. To conceal the menstruation check questions in the second phase of the study, questions about the participant's general health were also asked.

3. RESULTS

3.1. Preliminary analysis

We used a forecasting technique to estimate the dates of menstrual cycle to create balanced cells, however, following the experiment, many of our participants reported that the start of their period was delayed – an effect likely due to the breakout of the current pandemic. Although participant numbers were unbalanced, a non-significant Levene's test on the dependent variables ($p > .05$) indicated that variance across the four cells was homogeneous hence the equal variances assumption across condition groups was not violated.

The data collecting method was self-report and the dependent measures were applied in a cross-sectional design, potentially raising concerns for common method bias. We applied Harman's single-factor analysis to test common method bias, entering all items of the two measured variables. The results of this test indicated that, although the total variance attributed to the first emerging factor analysis was high (47%), it did not reach a critical value of 50%, hence we assumed that common method bias was not a pervasive issue in the data (Chang, et al., 2010; Podsakoff et.al., 2003).

An independent-samples t-test was conducted to test the outcome variables with respect to having or not having a driver's license. The driving self-esteem scores were higher in participants with driving license (M = 3.28, SD = .74) compared to participants without driving license (M = 2.76, SD = .66), $t(128) = 3.44$, $p < .05$. Similar results found for stress and tension dimension as well.

Participants with driving license (M = 2.36, SD = .74) had lower scores of stress and tension compared to participants without driving license (M = 2.89, SD = .79), $t(128) = -3.34$, $p < .05$.

3.2. Hypothesis testing

A moderated regression analysis was performed with stereotype salience condition (control or stereotype threat) as predictor, menstrual period (having or not having a menstrual period) as moderator; and driving self-esteem or stress and tension as outcome variables. Having a driver's license was used as a covariate the assumptions for moderated regression analysis were met with regards to the normal distribution of and independence of residuals. For the analysis, we used model 1 in the PROCESS macro for SPSS (Hayes, 2012).

For driving self-esteem, the main effects of stereotype salience and menstrual period were not significant hence H_{1a} were not supported for self-esteem (see *Table* 1). The two-way interaction between stereotype salience and menstrual period was significant (see *Figure* 1). As predicted in H_2, for participants who reported having menstrual period, self- esteem was significantly lower in the stereotype salient as compared to the control condition, B= -.62, t=-2.29, p=.02, d=.71. The difference was not significant for participants who reported not having a menstrual period. Not having a driver license was associated with lower self-esteem.

For stress and tension, having a driver's license was again used as a control variable. Hypotheses 1_b was rejected as the main effects did not reach significance (see *Table* 2*)*. The interaction effect reached significance (see *Figure* 2). Stress and tension was significantly higher in the stereotype salience condition as compared to the control condition *B=.66, t=2.33, p=.02, d=.72.* Thus, H_2 was confirmed for this interaction. The difference was not significant for participants who reported not having a menstrual period.

Table 1

Driving self-esteem predicted by stereotype salience and menstrual period (N=130)

Conditions	*coeff*	*se*	*t*	*LLCI*	*ULCI*
License (0=license; 1=no license)	-.54*	.15	-3.58*	-.84	-.24
Stereotype salience (0=control; 1=salient)	.09	.15	.63	-.20	.39
Period (0=no period; 1=period)	.18	.19	.96	-.19	.56
Stereotype salience*Period	-.62*	.27	-2.29*	-1.16	-.08

*Notes. *p < .05*

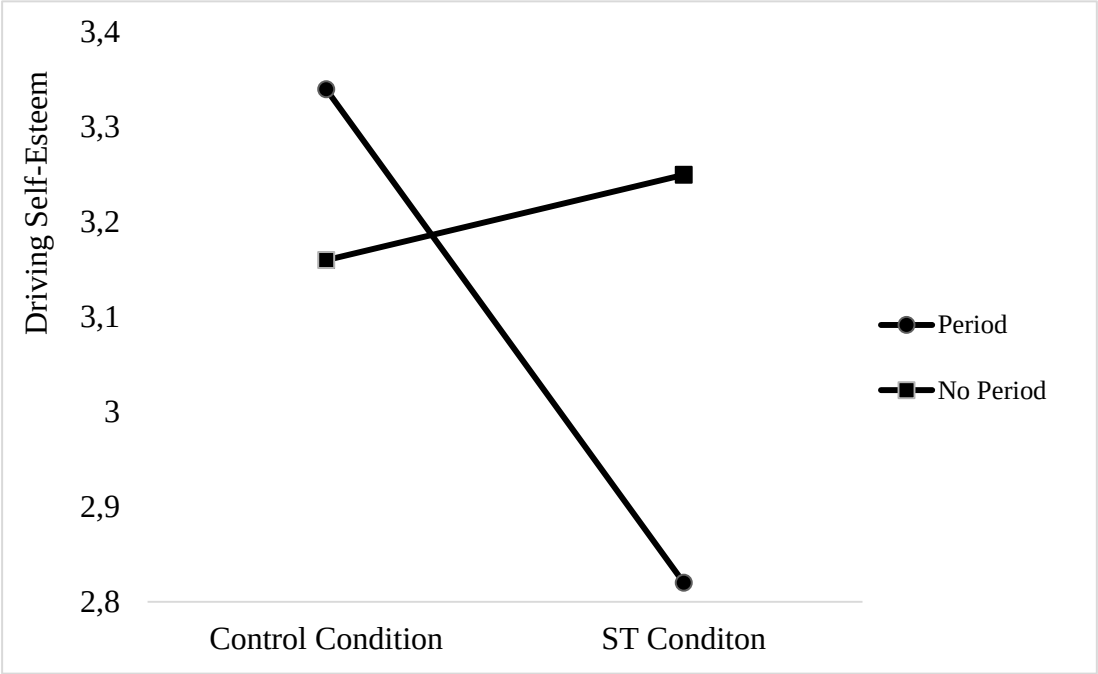

Figure 1. Interaction between stereotype salience condition and menstrual period for driving self esteem

Table 2

Stress and tension predicted by stereotype salience and menstrual period (N=130)

Conditions	*coeff*	*se*	*t*	*LLCI*	*ULCI*
License (0=license; 1=no license)	.53*	.15	3.38*	.22	.85
Stereotype salience (0=control; 1=salient)	-.10	.15	-.67	-.42	.20
Period (0=no period; 1=period)	-.29	.20	-1.43	-.69	.11
Stereotype salience*Period	.66*	.28	2.33*	0.10	1.23

*Notes. *p < .05*

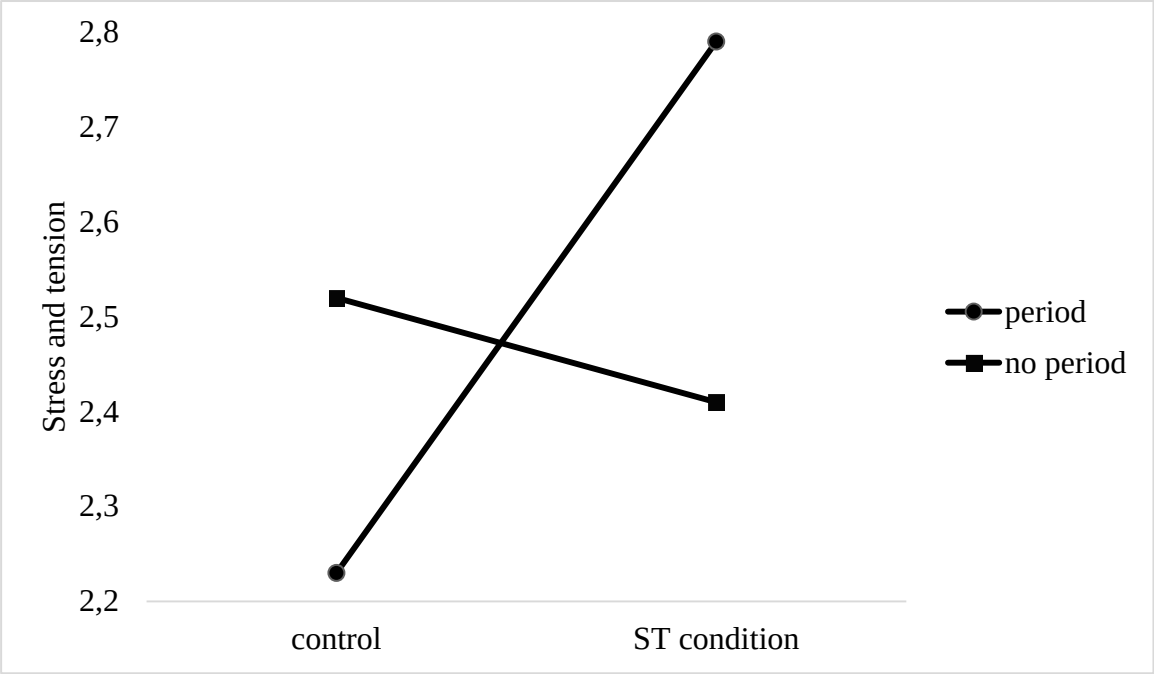

Figure 2. Interaction between stereotype threat and menstrual period for stress and tension

4. DISCUSSION

The objective of this research was to contribute to the stereotype threat literature on driving by investigating the effect of stereotype salience on women's driving-related self-perceptions (self-esteem and, stress and tension), and further, by exploring the role of menstrual cycle as a moderator of the effect of stereotype salience. We believe it is vital to expand the literature on driving stereotypes, one of the most pervasive stereotypes about women (Moe et al., 2015), particularly in Turkey, a country in which sexual conservatism and gender stereotypes are strongly held (Yılmaz, 2008). Menstrual cycle as a physiological mechanism has somewhat been overlooked as a possible moderator that may increase women's susceptibility to stereotype threat effects, as the past literature has focused more on cognitive, affective, and contextual factors.

Our results did not confirm our prediction with regards to the main effect of stereotype salience on driving self-esteem and, stress and tension. In fact, stereotype threat is an effect which often proves to be difficult to replicate, referred to as a "replication crisis" (Schimmack, 2017). Several researchers (e.g., Shewach, Sackett & Quint, 2019) maintain that reported stereotype threat effects are tainted by a publication bias. Although many studies have demonstrated that stereotype salience can interfere with a variety of skills or creates a situational predicament for individuals (Moe et al., 2015), Schimmack (2017) challenged former findings of Aronson and Steele (1995) in R-index and Test of Insufficient Variance (TIVA) analyses. Hence, our failed attempt to replicate stereotype salience effects supports those who question the pervasiveness of stereotype threat effects. Lewis and Michalak (2018) also inquired this co literature results as well. In their Meta-analysis they tested whether stereotype threats effect is profound in the first place or this effect attenuated over years. Their results suggest that stereotype threat indeed had an effect when tested in its first years but in years it especially for gender stereotypes, stereotype threats effects diminished relatively.

However, we found evidence for the moderating role of menstrual cycle: Our stereotype salience manipulations had a negative impact on those participants who reported having their menstrual period, both in terms of their self-esteem and stress and tension. These results confirmed our prediction proposing that having a menstrual period would increase the pertinence of stereotype salience for women, with a negative effect on their driving related self-perceptions. We argue that

having a menstrual period increases women's awareness of being a member of their gender category, and supposedly this increased sense of identity enhances the applicability of the stereotype to targeted women (Pennington, et al., 2016), besides the physical distress and hormonal fluctuations that are caused by menstruation (Lindsey, 2016). When these two stress factors are combined (i.e., stereotype salience and menstrual period), participants become more susceptible to these situational adverse effects. The impact of stereotype salience for those who reported having a period proved to have a large effect size on both driving self-esteem and, stress and tension, indicating that this effect has practical implications. Increasing women drivers' awareness of their vulnerability to negative stereotyping while having a period may help these women cope with negative implications by attempts to reduce their stress and tension and to improve self-esteem.

Although the generalizability of stereotype threat effects has been doubted (e.g., Schimmack, 2017) and stereotype threat in high stake settings has been shown to be associated only with a small effect size (e.g., Shewach, Sackett & Quint, 2019), studies on moderators indicate that factors within the individual and/or the context can magnify stereotype threat effects. The large effect sizes for the moderated effects, besides other moderation effects in the same magnitude found in the literature, indicate that stereotype threat should be extensively studied in terms of moderation. Although the effect may not be as pervasive as previously suggested (Steele & Aronson, 1995), as our research indicates, some individuals are highly vulnerable to stereotype threat effects, while others are not.

Our attempt to forecast menstruation dates was supposedly a strength of the design, however, the current pandemic conditions attenuated the accuracy of this forecasting, as the stressful condition of the pandemic, combined with declined physical activity in quarantine, was likely responsible for irregularity in our participants' menstrual cycles (Aksoy-Derya, et al., 2017). As a further limitation, the sample mostly consisted of under-graduate students, hence the findings are particularly relevant for this age-group. Finally, the online self-report forms, rather than a face-to-face lab context, may induced participants not to disclose some of their thoughts and behavior as if they were their original thoughts (Bosson, et al., 2004). Future research should investigate the role of menstruation cycle in driving and other stereotyped performance dimensions with representative samples of the population, preferably in lab studies, as the pandemic conditions allow, to test performance implications besides self-perceptions.

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