# Investigation of the Relation between Face Anatomy and Leadership Personality Trait: Sample of Faculty of Medicine Students

Tugce Baki and Rengin Kosif\*

Faculty of Medicine, Department of Anatomy, Bolu Abant Izzet Baysal University, Bolu, Turkey

Corresponding author: Rengin Kosif, Faculty of Medicine, Department of Anatomy, Bolu Abant Izzet Baysal University, Gölköy Campus, 14030, Bolu, Turkey, Tel: +9003742534656; Fax: +903742534615 E-mail: rengink@yahoo.com

### Abstract

**Objective:** The aim of this study has to investigate the relationship some facial dimensions with between leadership personality traits. Methods: 139 university students have participated in our study. Two face photos from the front and the profile have been taken with the digital camera and transferred to the computer. 21 measurements including face and ear distances have been performed. A 32-question questionnaire has been applied to the participants about leadership personality traits. Results: According to the results we obtained from statistical analysis, it has been determined that the upper face length in women has shown a very weak positive correlation with the human leadership trait. A very weak positive correlation has been determined between philtrum length and human leadership trait in women. A very weak positive correlation between philtrum length and charismatic leadership trait in women. A weak negative correlation between philtrum depth and human leadership trait has been found in women. When the correlation coefficients and significance levels between leadership traits and facial anatomic measurements in the men have been examined, no statistically significant results have been found. Conclusion: Upper face length, philtum length and depth in women may give information about leadership personality trait. We hope this result contribute to the different disciplines.

Keywords: Face anatomy; Leadership; Personality traits

## Introduction

The variation in human face is an important and complex phenomenon that cannot be exactly explained from the scientific aspect.<sup>[1]</sup> The shape of our face is also an important factor influencing the interpersonal communication and the behaviors as well. It was reported that, in the first period of life, the shape of face provides preliminary information about our personality development in the future.<sup>[2]</sup> The appearance of our face is one of the main components indicating our mood. Our personality traits reflect on the appearance of our face.<sup>[3]</sup> The reflection of emotions on the facial expressions plays an important role in our social life.<sup>[4]</sup> Since the facial expressions originating from the reflection of emotions on the face lay the foundation of the communication between individuals, it is thought to have an important effect on the estimations about personality traits.<sup>[5]</sup> In the literature, there are scientific studies investigating the facial anatomy, performing anatomic measurements, and reporting the average values.<sup>[6-10]</sup> The relationship of eye, nose, ear, forehead, and lip sizes and facial heights with the leadership trait has not been investigated. In the present study, it was aimed to shed light on this subject and to investigate the statistically significant relationships between leadership trait subgroups (structural leadership, human source leadership, political leadership, and symbolic leadership) and facial anatomy.

#### Methods

#### Ethics committee approval, field, and sample

In the present study, 139 voluntary university students (79 672 girls and 69 boys) in total. Prior to the study, the approval was obtained from the Bolu Abant Izzet Baysal University (BAIBU) Clinical Researches Ethics Committee (date: 01.25.2018, no: 60, decision no: 2018/08) and then the study was initiated. The participants were selected among the students studying at the Medical Faculty of BAIBU based on the principle of voluntariness. Among the participants, those having no congenital or acquired nose, ear, lip, eye and/or chin anomaly, having no history of surgery at these sites, and aged between 17 and 21 years were involved. The mean age of participants was calculated to be  $19.87 \pm 1.33$  years for girls and  $19.64 \pm 0.97$  years for boys.

#### **Data collection method**

Using a Canon D5 35 mm camera fixed on a tripod under the daylight; the face photos of individuals were taken from two sides (1 from the front and 1 from the profile). The shootings were performed at 2 m distance from the object standing, with open eyes, normal and closed lips, and completely visible forehead and face. The facial measurements were performed at mm sensitivity by a single person using Image J 1.52 a (National Institutes of Health, USA) program. At the same time, the

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

**How to Cite this Article:** Baki T, et al. Investigation of the Relation between Face Anatomy and Leadership Personality Trait: Sample of Faculty of Medicine Students. Ann Med Health Sci Res. 2019;9: 672-677

participants were asked to fill a 32-item Leadership Orientation Scale. For this purpose, the survey, which was developed by Mahçe Dereli and reliability and validity of which were tested for the Turkish population.<sup>[11]</sup> She was informed about the use of her scale in the present study, and her approval was obtained. The titles of structural leadership, human source leadership, symbolic leadership, and political leadership were analyzed.

23 measurements performed on the photos of female and male university students aged between 17 and 21 years by using Image J 1.52 a (National Institutes of Health, USA) program are as follows [Table 1] [Figures 1 and 2]. In measuring the distances, the study carried out by Ashgari et al. was taken as basis.<sup>[9]</sup>

It was recorded if the earlobe is attached and if there is Darwin tubercle in the earlap [Figure 3]. The method developed by Susan J. Astley was used in measuring the philtrum depth. Philtrum depth was rated between 1: deepest and 5: most shallow.<sup>[12]</sup>

The measurements were recorded in Excel software and the statistical significance was analyzed. Statistical analyses were performed using SPSS (IBM SPSS for Windows, Ver.24) program. The mean values and standard deviations of the measurements were calculated. In comparing the groups' mean values for continuous variables, independent t-test or One-Way Variance Analysis (ANOVA) was used. For the comparisons, in which statistically significant differences were observed, the Duncan test was used for determining the categories. Pearson's correlation coefficients were calculated for determining the relationship between leadership trait and facial measurements. For the categorical variables, Chi-Square test was used for determining the leadership categories. The statistical significance level was set to p<0.05.

#### **Results**

The mean values and standard deviations of anatomic facial measurements are expressed in mm and presented in Table 2. The distance between eyebrows, the distance between the beginnings of eyebrow and eye, and the earlobe width were found to be statistically significantly higher among girls when compared to the boys. Among the boys, the nose length, width, and height, lower face length, forehead width, mouth width, and upper lip thickness values were found to be higher than among the girls.

In Tables 3 and 4, the results regarding the relationship of the percentage of Darwin's tubercle and attached earlobe's presence with the sex and the relationships between sex and presence of attached earlobe and between sex and presence of Darwin's tubercle are presented. Among boys and girls, the presence of Darwin's tubercle was found to have no relationship with leadership. Besides that, the presence of attached or free earlobe was also found to have no relationship with leadership among boys and girls.

Given the correlation coefficients and significance levels between the leadership trait and facial anatomic results of the boys, it was determined that there was no statistically significant

#### Table 1: Measured anatomical distances.

Eye Width (EW) Distance Between Eyebrow (DEB) Nose Length (NL) Nose Height (NH) Lower Face Height (LFH) Forehead Width (FW) Philtrum Length (PL) Upper Lip Thickness (UT) Mouth Width (MW) Ear Width (EW) Ear Lobe Length (ELL) Darwin Tubercle: Have or not Distance Between Eyes (DE) Distance Between The Beginning of Eye and Eyebrow (DEEB) Nose Width (NW) Upper Face Length (UFL) Middle Face Length (MFL) Midle Face Width (MFW) Philtrum Depth (PD) Lower Lip Thickness (LT) Ear Length (EL) Ear Lobe Width (ELW) Ear Lobe: Free or Attached



**Figure 1:** Eye Width (EW), Distance Between Eyes (DE), Distance Between Eyebrow (DEB), Distance Between the Beginning of Eye and Eyebrow (DEEB), Nose Width (NW), Upper Face Length (UFL), Lower Face Length (LFL), Middle Face Length (MFL), Forehead Width (FW), Middle Face Width (MFW), Philtrum Length (PL), Upper Lip Thickness (UT), Lower Lip Thickness (LT), Mouth Width (MW).



Figure 2: Nose Length (NL), Nose Height (NH), Ear Length (EL), Ear Width (EW), Ear Lobe Width (ELW), Ear Lobe Length (ELL).



Figure 3: A) Free ear lobe B) Attached ear lobe C) Darwin tubercle presence.

Table 2: Comparison of mean values of measurements related to gender.							
Gender							
Male		Female		n valuo			
Mean	Sd	Mean	Sd	p-value			
33,17	4,11	32,73	3,15	0,482			
38,32	5,78	38,13	4,73	0,836			
22,10	5,28	25,64	4,62	<0,001			
17,54	4,02	19,10	3,37	0,014			
55,15	5,95	51,28	7,97	0,001			
44,28	6,27	40,49	4,31	<0,001			
34,87	3,80	31,72	4,33	<0,001			
61,90	7,73	64,14	8,16	0,099			
67,92	8,21	68,79	7,64	0,520			
80,74	13,86	74,15	10,05	0,002			
134,55	18,04	125,13	14,55	0,001			
156,12	22,02	155,50	17,12	0,852			
56,78	8,50	53,17	5,66	0,004			
9,78	2,19	8,50	1,93	<0,001			
11,79	2,25	11,22	2,06	0,125			
18,22	4,16	16,94	3,84	0,062			
2,28	0,92	2,33	,99	0,743			
78,95	9,99	75,66	7,86	0,032			
37,32	4,37	35,59	5,80	0,048			
21,95	3,38	21,76	3,83	0,748			
21,92	4,11	24,43	4,89	0,001			
	of measurement Ma Mean 33,17 38,32 22,10 17,54 55,15 44,28 34,87 61,90 67,92 80,74 134,55 156,12 56,78 9,78 11,79 18,22 2,28 78,95 37,32 21,95 21,92	Mean     Sd       33,17     4,11       38,32     5,78       22,10     5,28       17,54     4,02       55,15     5,95       44,28     6,27       34,87     3,80       61,90     7,73       67,92     8,21       80,74     13,86       134,55     18,04       156,12     22,02       56,78     8,50       9,78     2,19       11,79     2,25       18,22     4,16       2,28     0,92       78,95     9,99       37,32     4,37       21,95     3,38       21,92     4,11	Mean     Sd     Mean       33,17     4,11     32,73       38,32     5,78     38,13       22,10     5,28     25,64       17,54     4,02     19,10       55,15     5,95     51,28       44,28     6,27     40,49       34,87     3,80     31,72       61,90     7,73     64,14       67,92     8,21     68,79       80,74     13,86     74,15       134,55     18,04     125,13       156,12     22,02     155,50       56,78     8,50     53,17       9,78     2,19     8,50       11,79     2,25     11,22       18,22     4,16     16,94       2,28     0,92     2,33       78,95     9,99     75,66       37,32     4,37     35,59       21,95     3,38     21,76       21,92     4,11     24,43	Gender       Gender       Male     Female       Mean     Sd       33,17     4,11     32,73     3,15       38,32     5,78     38,13     4,73       22,10     5,28     25,64     4,62       17,54     4,02     19,10     3,37       55,15     5,95     51,28     7,97       44,28     6,27     40,49     4,31       34,87     3,80     31,72     4,33       61,90     7,73     64,14     8,16       67,92     8,21     68,79     7,64       80,74     13,86     74,15     10,05       134,55     18,04     125,13     14,55       156,12     22,02     155,50     17,12       56,78     8,50     53,17     5,66       9,78     2,19     8,50     1,93       11,79     2,25     11,22     2,06       18,22     4,16     16,94     3,84       2,28     0,92			

Table 3: Darwin tubercle distributions and correlations.								
Variables		Gender						
			Male			Female		p-value
Donuin tuborolo	Absent	51	73,9%	53,7%	44	62,9%	46,3%	0 161
Darwin tubercie	Presence	18	26,1%	40,9%	26	37,1%	59,1%	0,101

Table 4: Ear lobe morphology distributions and correlations.								
Gender								
			Male			Female		p-value
Forlaha	Free	45	65,2%	45,9%	53	75,7%	54,1%	0.175
Earlobe	Attached	24	34,8%	58,5%	17	24,3%	41,5%	0,175

result. However, the correlation (r) and significance (p) values for the relationship between leadership trait and anatomic measurements among the girls are presented in Table 5.

Given the correlation coefficients and significance levels for the relationship between leadership trait and facial anatomy measurements among the girls, it can be seen that upper face length showed a very weak and positive correlation with human source leadership (r=0.242; p=0.031). As the upper face length of the girls increases, the human source leadership trait also increases. A very weak and positive correlation was determined between philtrum length and human source leadership among the girls (r=0.252; p=0.036). As the philtrum length increases, the human source leadership trait of the girls also increases. A very weak and positive correlation was found between philtrum length and symbolic leadership trait among the girls (r=0.256; p=0.032). As the philtrum length increases, the symbolic leadership trait of girls also increases. A weak and negative correlation was determined between the philtrum depth and

VariableSharboal Redevant POnderNumerican Redevant POnderNumerican Redevant POnderNumerican RedNumerican R	Table 5: Correlation coefficients and significance levels in female.								
Eye Width     r     0.049     0.088     0.194     0.099       Distance Between Eyes     r     -0.211     0.024     0.068     -0.061       Distance Between Eyetrow     r     -0.017     0.173     0.011     0.081       Distance Between The Beginning of Eye And Eyetrow     r     -0.005     0.139     -0.031     0.086       Distance Between The Beginning of Eye And Eyetrow     p     0.966     0.250     0.799     0.478       Nose Length     r     -0.073     0.018     0.014     -0.070       Nose Width     r     -0.073     0.088     0.104     -0.012       Nose Width     r     -0.073     0.088     0.014     0.012       Upper Face Length     r     -0.073     0.088     0.081     0.051     0.056     0.241     0.051       Middle Face Length     r     -0.076     0.794     0.836     0.861       P     0.960     0.338     0.612     0.533     0.612     0.533       Lower Face Length     r     -0.017	Variables	Structural leadership	Human source leadership	Political leadership	Symbolic leadership				
Leye Walth     p     0.687     0.421     0.108     0.413       Distance Between Eyes     r     -0.211     0.024     0.068     -0.063       Distance Between Eyebrow     r     -0.117     0.170     0.123     0.011       Distance Between The Beginning of Eye And Eyebrow     r     -0.005     0.139     -0.031     0.086       Distance Between The Beginning of Eye And Eyebrow     r     -0.037     -0.113     0.040     -0.034       Nose Length     r     -0.073     0.018     0.714     0.733     0.926       Nose Width     r     -0.073     0.018     0.014     0.012       Nose Heigth     r     -0.073     0.018     0.014     0.012       Nose Heigth     r     -0.076     0.744     0.836     0.861       Upper Face Length     r     -0.076     0.744     0.836     0.861       Distance Face Length     r     -0.017     0.106     0.062     0.076       Distance Face Length     r     -0.034     0.143     0.113 <t< td=""><td>Evo Midth</td><td>r</td><td>0,049</td><td>0,098</td><td>0,194</td><td>0,099</td></t<>	Evo Midth	r	0,049	0,098	0,194	0,099			
Distance Between Eyes     r     -0.211     0.024     0.068     -0.006       Distance Between Eyebrow     r     -0.117     0.170     0.123     0.011       Distance Between The Beginning of Eye And Eyebrow     r     -0.0037     -0.113     0.0401     0.086       Distance Between The Beginning of Eye And Eyebrow     r     -0.037     -0.113     0.040     -0.034       Nose Length     r     -0.073     0.088     0.104     -0.012       Nose Vidth     r     -0.073     0.088     0.104     0.012       Nose Heigth     r     -0.076     0.794     0.830     0.861       Upper Face Length     r     -0.017     0.016     0.068     0.944       Middle Face Length     r     -0.017     0.106     0.062     0.076       Middle Face Length     r     -0.034     0.143     0.111     0.137       Lower Face Length     r     -0.036     0.133     0.661     0.359     0.258       Middle Face Width     r     -0.034     0.143     0.111 <td>Eye widin</td> <td>р</td> <td>0,687</td> <td>0,421</td> <td>0,108</td> <td>0,413</td>	Eye widin	р	0,687	0,421	0,108	0,413			
Distance Between Eyes     p     0,080     0,844     0,574     0,963       Distance Between The Beginning of Eye And Eyebrow     r     -0,117     0,176     0,130     0,081       Distance Between The Beginning of Eye And Eyebrow     r     -0,005     0,139     -0.031     0,086       Nose Length     r     -0,037     -0,113     0,040     -0,034       Nose Vidth     r     -0,037     0,088     0,104     -0,013       Nose Width     r     -0,073     0,088     0,104     -0,012       Nose Heigth     r     -0,075     0,794     0,836     0,881       Upper Face Length     r     -0,017     0,106     0,062     0,079       Middle Face Width     r     -0,016     0,124     0,552     0,100	Distance Detugen Fue	r	-0,211	0,024	0,068	-0,006			
Distance Between Eyebrow     r     -0.117     0.170     0.123     0.011       Distance Between The Beginning of Eye And Eyebrow     r     -0.005     0.139     -0.031     0.086       Nose Length     p     0.969     0.250     0.799     0.478       Nose Length     p     0.761     0.351     0.744     0.780       Nose Vidth     r     -0.073     0.088     0.104     0.012       Nose Heigth     r     0.038     0.032     0.025     0.021       Upper Face Length     r     -0.017     0.106     0.038     0.612     0.533       Lower Face Length     r     -0.034     0.143     0.111     0.137       P     0.9661     0.307     0.216     0.152     0.107     0.111       Modele	Distance Between Eyes	р	0,080	0,844	0,574	0,963			
Distance Between The Beginning of Eye And Eyebrow     p     0.333     0.159     0.310     0.931       Distance Between The Beginning of Eye And Eyebrow     p     0.9669     0.2200     0.799     0.478       Nose Length     r     -0.037     -0.113     0.040     -0.034       Nose Length     r     -0.073     0.088     0.104     0.012       Nose Width     r     -0.073     0.088     0.104     0.012       p     0.549     0.466     0.393     0.920       Nose Heigth     r     -0.038     0.032     0.022     0.021       Upper Face Length     p     0.091     0.046     0.031     0.568     0.941       Middle Face Length     r     -0.017     0.106     0.062     0.076       p     0.890     0.333     0.612     0.533     0.612     0.533       Lower Face Length     r     -0.034     0.143     0.111     0.137     0.173     0.171     0.106     0.568     0.579     0.515     0.579     0.515	Distance Detucer Fuchacu	r	-0,117	0,170	0,123	0,011			
Distance Between The Beginning of Eye And Eyebrow     r     -0.005     0.139     -0.031     0.086 0.799     0.478       Nose Length     r     -0.037     -0.113     0.040     -0.034       Nose Width     r     -0.073     0.088     0.104     0.012       Nose Width     r     -0.073     0.088     0.104     0.012       Nose Heigth     r     -0.038     0.032     0.025     0.021       Nose Heigth     r     -0.038     0.032     0.025     0.021       Upper Face Length     r     -0.0204     0.242     0.069     -0.009       Middle Face Length     r     -0.017     0.106     0.062     0.076       p     0.890     0.333     0.612     0.533     0.256       Forehead Width     r     -0.034     0.143     0.113     0.079       p     0.9661     0.337     0.214     0.152     0.100       p     0.961     0.307     0.210     0.411       Middle Face Width     r     -0.165	Distance Between Eyebrow	р	0,333	0,159	0,310	0,931			
Eye And Eyebrow     p     0,969     0,250     0,799     0,478       Nose Length     r     -0,037     -0,113     0,040     -0,034       Nose Width     r     -0,073     0,088     0,104     0,012       Nose Width     r     -0,073     0,088     0,104     0,012       Nose Heigth     r     -0,038     0,032     0,025     0,021       Upper Face Length     r     -0,204     0,242     0,668     -0,009       Middle Face Length     r     -0,017     0,106     0,662     0,076       Middle Face Length     r     -0,006     0,133     0,111     0,137       Forehead Width     r     -0,006     0,133     0,111     0,137       Modthe Face Width     r     -0,006     0,124     0,152     0,100       Modtle Face Width     r     -0,165     0,033     0,067     0,028       p     0,721     0,786     0,579     0,815     0,77     0,816     0,217       f     0,165 </td <td>Distance Between The Beginning of</td> <td>r</td> <td>-0,005</td> <td>0,139</td> <td>-0,031</td> <td>0,086</td>	Distance Between The Beginning of	r	-0,005	0,139	-0,031	0,086			
Nose Length     r     -0.037     -0.113     0.040     -0.034       Nose Width     r     -0.073     0.088     0.104     0.012       Nose Heigth     r     -0.038     0.032     0.025     0.021       Nose Heigth     r     -0.038     0.032     0.025     0.021       Upper Face Length     r     -0.204     0.242     0.069     -0.009       Middle Face Length     r     -0.017     0.106     0.062     0.076       Middle Face Length     r     -0.017     0.106     0.062     0.076       P     0.860     0.383     0.612     0.533       Lower Face Length     r     -0.034     0.143     0.113     0.079       P     0.960     0.396     0.350     0.515     0.516       Middle Face Width     r     -0.034     0.143     0.113     0.079       P     0.961     0.307     0.210     0.411       Modth Width     r     -0.165     0.033     0.667     0.028 <td>Eye And Eyebrow</td> <td>р</td> <td>0,969</td> <td>0,250</td> <td>0,799</td> <td>0,478</td>	Eye And Eyebrow	р	0,969	0,250	0,799	0,478			
Nose Length     p     0.761     0.351     0.744     0.780       Nose Width     r     -0.073     0.088     0.104     0.012       Nose Heigth     r     -0.038     0.032     0.025     0.021       Nose Heigth     r     -0.038     0.032     0.025     0.021       Upper Face Length     r     -0.204     0.242     0.069     -0.009       Middle Face Length     r     -0.017     0.106     0.062     0.076       Middle Face Length     r     -0.017     0.106     0.062     0.076       Forehead Width     r     -0.034     0.113     0.111     0.137       Middle Face Width     r     -0.034     0.143     0.113     0.079       p     0.782     0.236     0.350     0.515     0.1512     0.100       Middle Face Width     r     -0.006     0.124     0.152     0.100       p     0.961     0.307     0.214     0.152     0.100       Mouth Width     p     0.172	Nego Longth	r	-0,037	-0,113	0,040	-0,034			
Nose Width     r     -0.073     0.088     0.104     0.012       Nose Heigth     p     0.549     0.466     0.393     0.920       Nose Heigth     p     0.038     0.032     0.025     0.021       Upper Face Length     r     -0.204     0.242     0.069     -0.099       Middle Face Length     r     -0.017     0.106     0.062     0.076       Middle Face Length     r     -0.017     0.106     0.062     0.076       Lower Face Length     r     -0.034     0.113     0.113     0.179       p     0.960     0.396     0.359     0.256       Forehead Width     r     -0.034     0.143     0.113     0.079       Middle Face Width     r     -0.016     0.307     0.210     0.411       Mouth Width     p     0.772     0.785     0.579     0.815       Upper Lip Thickness     r     0.150     -0.004     0.185     0.217       Mouth Width     p     0.706     0.089 <td< td=""><td>Nose Lengui</td><td>р</td><td>0,761</td><td>0,351</td><td>0,744</td><td>0,780</td></td<>	Nose Lengui	р	0,761	0,351	0,744	0,780			
Nose Heigth     p     0,549     0,466     0,333     0,920       Nose Heigth     r     0,038     0,032     0,025     0,021       Upper Face Length     r     -0,204     0,242     0,069     -0,009       Middle Face Length     p     0,091     0,031     0,568     0,941       Middle Face Length     p     0,890     0,383     0,612     0,533       Lower Face Length     r     -0,006     0,103     0,111     0,137       p     0,960     0,396     0,359     0,256     0,515       Forehead Width     r     -0,006     0,143     0,113     0,079       Middle Face Width     r     -0,006     0,314     0,152     0,100       Mouth Width     r     -0,165     0,033     0,067     0,028       Mouth Width     r     -0,166     0,033     0,067     0,028       p     0,172     0,785     0,579     0,815       Lower Lip Thickness     r     0,046     0,205     0,223<	Nose Width	r	-0,073	0,088	0,104	0,012			
Nose Heigth     r     0.038     0.032     0.025     0.021       Upper Face Length     p     0.756     0.774     0.836     0.661       Upper Face Length     p     0.091     0.031     0.568     0.941       Middle Face Length     r     -0.017     0.106     0.062     0.076       Middle Face Length     r     -0.017     0.106     0.062     0.533       Lower Face Length     r     -0.0066     0.103     0.111     0.137       P     0.960     0.386     0.359     0.256       Forehead Width     r     -0.034     0.143     0.113     0.079       P     0.755     0.579     0.815     0.111     0.307     0.210     0.411       Mouth Width     r     -0.165     0.033     0.067     0.028     0.633     0.117       P     0.172     0.785     0.579     0.815     0.117       Mouth Width     r     0.0161     0.308     0.663     0.113     0.032 <td< td=""><td></td><td>р</td><td>0,549</td><td>0,466</td><td>0,393</td><td>0,920</td></td<>		р	0,549	0,466	0,393	0,920			
Noise Height     p     0.756     0.794     0.836     0.861       Upper Face Length     r     -0.204     0.242     0.069     -0.009       Middle Face Length     r     -0.017     0.106     0.062     0.076       Middle Face Length     p     0.890     0.383     0.612     0.533       Lower Face Length     r     0.0960     0.396     0.359     0.256       Forehead Width     r     -0.034     0.143     0.113     0.079       p     0.782     0.236     0.350     0.515       Middle Face Width     r     -0.034     0.143     0.113     0.079       p     0.961     0.307     0.210     0.411       Mouth Width     r     -0.165     0.033     0.067     0.028       Upper Lip Thickness     r     0.172     0.785     0.579     0.815       Upper Lip Thickness     r     0.046     0.205     0.223     0.189       p     0.452     0.036     0.113     0.032     0.1	Nooo Hoigth	r	0,038	0,032	0,025	0,021			
Upper Face Length     r     -0,204     0,242     0,069     -0,009       Middle Face Length     r     -0,017     0,106     0,062     0,053       Lower Face Length     r     -0,080     0,383     0,612     0,533       Lower Face Length     r     0,006     0,103     0,111     0,137       p     0,960     0,396     0,359     0,256       Forehead Width     r     -0,006     0,143     0,113     0,079       p     0,782     0,236     0,350     0,515       Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     r     -0,155     0,307     0,210     0,411       Mouth Width     r     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       p     0,214     0,973     0,124     0,072     0,785     0,579     0,815       Upper Lip Thickness     r     0,0160     0,0	Nose Heigin	р	0,756	0,794	0,836	0,861			
Opper Face Length     p     0.091     0.031     0.568     0.941       Middle Face Length     r     -0.017     0.106     0.062     0.076       Lower Face Length     r     0.006     0.133     0.612     0.533       Lower Face Length     p     0.960     0.396     0.359     0.256       Forehead Width     r     -0.034     0.143     0.113     0.079       Middle Face Width     r     -0.034     0.143     0.113     0.079       Middle Face Width     r     -0.034     0.143     0.113     0.079       Mouth Width     r     -0.165     0.033     0.067     0.028       p     0.172     0.785     0.579     0.815       Upper Lip Thickness     r     0.165     0.033     0.067     0.028       p     0.214     0.973     0.124     0.072     0.172       Lower Lip Thickness     r     0.046     0.205     0.223     0.185       p     0.706     0.089     0.063     0	Linner Feas Length	r	-0,204	0,242	0,069	-0,009			
Middle Face Length     r     -0,017     0,106     0,062     0,076       Lower Face Length     r     0,006     0,133     0,111     0,137       Lower Face Length     r     0,060     0,396     0,359     0,256       Forehead Width     r     -0,034     0,143     0,113     0,079       p     0,782     0,236     0,350     0,515       Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     r     -0,165     0,033     0,067     0,228       Upper Lip Thickness     r     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,046     0,205     0,223     0,189       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       Philtrum Length     r     0,046     0,205     0,223     0,189       Philtrum Depth     r     0,011     0,252     0,191     0,256       P     0,340     0,002     0,073	Opper Face Length	р	0,091	0,031	0,568	0,941			
Middle Face Length     p     0.890     0.383     0.612     0.533       Lower Face Length     r     0.006     0.103     0.111     0.137       Forehead Width     r     -0.034     0.143     0.113     0.079       p     0.782     0.236     0.350     0.515       Middle Face Width     r     -0.006     0.124     0.152     0.100       Mouth Width     r     -0.165     0.033     0.067     0.214       Mouth Width     r     0.172     0.785     0.579     0.815       Upper Lip Thickness     r     0.165     0.033     0.124     0.072       Lower Lip Thickness     r     0.170     0.785     0.579     0.815       p     0.214     0.973     0.124     0.072       Lower Lip Thickness     r     0.046     0.205     0.223     0.189       p     0.452     0.036     0.113     0.032     0.177       Philtrum Length     r     -0.046     0.252     0.191     0.256 <td>Middle Feed Leasth</td> <td>r</td> <td>-0,017</td> <td>0,106</td> <td>0,062</td> <td>0,076</td>	Middle Feed Leasth	r	-0,017	0,106	0,062	0,076			
Lower Face Length     r     0,006     0,103     0,111     0,137       Forehead Width     r     -0,034     0,143     0,133     0,079       Porehead Width     r     -0,034     0,143     0,113     0,079       Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     r     -0,066     0,033     0,067     0,028       Mouth Width     r     -0,165     0,033     0,067     0,028       Upper Lip Thickness     r     0,172     0,785     0,579     0,815       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       Lower Lip Thickness     r     0,0706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       Philtrum Depth     r     -0,066     -0,034     -0,089     0,033     0,613       Ear Lobe Length	Middle Face Length	р	0,890	0,383	0,612	0,533			
Lower Pade Lengin     p     0,960     0,396     0,359     0,256       Forehead Width     r     -0,034     0,143     0,113     0,079       p     0,782     0,236     0,350     0,515       Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     r     -0,165     0,033     0,067     0,028       Mouth Width     r     -0,165     0,033     0,067     0,028       Upper Lip Thickness     r     0,172     0,785     0,579     0,815       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       p     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       p     0,452     0,036     0,113     0,032       Ear Length     r     -0,016     -0,034     -0,089     -0,033       Ear Length     r     -0,066     -0,034     -0,089     -0,033 <t< td=""><td>Lower Food Longth</td><td>r</td><td>0,006</td><td>0,103</td><td>0,111</td><td>0,137</td></t<>	Lower Food Longth	r	0,006	0,103	0,111	0,137			
Forehead Width     r     -0,034     0,143     0,113     0,079       p     0,782     0,236     0,350     0,515       Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     p     0,961     0,307     0,210     0,411       Mouth Width     p     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       P     0,706     0,089     0,063     0,117       Philtrum Length     r     0,016     -0,252     0,191     0,256       P     0,452     0,036     0,113     0,032     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,031       Ear Lobe Length     r     -0,066     0,034     -0,089     -0,031       Ear Lobe Length     r     -0,066     -0,034     -0,089     -0,031	Lower Face Length	р	0,960	0,396	0,359	0,256			
p     0,782     0,236     0,350     0,515       Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     p     0,961     0,307     0,210     0,411       Mouth Width     r     -0,165     0,033     0,067     0,028       Upper Lip Thickness     r     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,046     0,205     0,223     0,189       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       Philtrum Length     r     0,046     0,205     0,223     0,189       Philtrum Depth     r     0,0452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     0,0433     -0,010     0,031     -0,060       Ear Lobe Length     r     -0,0661     -0,231	Forehead Width	r	-0,034	0,143	0,113	0,079			
Middle Face Width     r     -0,006     0,124     0,152     0,100       Mouth Width     r     -0,165     0,033     0,067     0,028       Mouth Width     r     -0,165     0,033     0,067     0,028       Upper Lip Thickness     r     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       Philtrum Length     r     0,091     0,252     0,191     0,256       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       Philtrum Depth     r     -0,066     -0,034     -0,089     -0,033       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     -0,066     -0,034     -0,089     -0,033       Ear Lobe Length     r     -0,066     -0,034     -0,089     -0,033       Ear Lobe Width     p <td< td=""><td></td><td>р</td><td>0,782</td><td>0,236</td><td>0,350</td><td>0,515</td></td<>		р	0,782	0,236	0,350	0,515			
Middle Face within     p     0,961     0,307     0,210     0,411       Mouth Width     r     -0,165     0,033     0,067     0,028       Mouth Width     p     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       P     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       P     0,452     0,036     0,113     0,032     0,793     0,138       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       P     0,340     0,002     0,073     0,138     0,788       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     0,0723     0,937     0,797     0,619       Ear Lobe Length     r     -0,061     -0,231	Middle Fees Width	r	-0,006	0,124	0,152	0,100			
Mouth Width     r     -0,165     0,033     0,067     0,028       P     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       Philtrum Length     r     0,091     0,252     0,191     0,256       P     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,166     -0,359     -0,216     -0,179       P     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     p     0,586     0,782     0,463     0,788       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       P     0,614     0,055     0,382     0,353       Ear Lobe Width     p     0,614     0,047     -0,051     0,003       P     0,614 </td <td>Middle Face Width</td> <td>р</td> <td>0,961</td> <td>0,307</td> <td>0,210</td> <td>0,411</td>	Middle Face Width	р	0,961	0,307	0,210	0,411			
Moduli Width     p     0,172     0,785     0,579     0,815       Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       p     0,214     0,973     0,124     0,072       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       p     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     p     0,586     0,782     0,463     0,788       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Width     p     0,783	Mouth Midth	r	-0,165	0,033	0,067	0,028			
Upper Lip Thickness     r     0,150     -0,004     0,185     0,217       p     0,214     0,973     0,124     0,072       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       p     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     p     0,586     0,782     0,463     0,788       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Length     r     -0,034     0,047     -0,051     0,003       p     0,614     0,055		р	0,172	0,785	0,579	0,815			
p     0,214     0,973     0,124     0,072       Lower Lip Thickness     r     0,046     0,205     0,223     0,189       p     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     0,043     -0,010     0,031     -0,060       p     0,723     0,937     0,797     0,619       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,614     0,055     0,382     0,353 </td <td>Upper Lip Thickness</td> <td>r</td> <td>0,150</td> <td>-0,004</td> <td>0,185</td> <td>0,217</td>	Upper Lip Thickness	r	0,150	-0,004	0,185	0,217			
Lower Lip Thickness     r     0,046     0,205     0,223     0,189       Philtrum Length     p     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       Philtrum Depth     p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     -0,066     -0,034     -0,089     -0,033       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353     -0,113       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,614     0,055     0,382     0,353     -0,033     0,698     0,678     0,977		р	0,214	0,973	0,124	0,072			
Lower Lip Hitckness     p     0,706     0,089     0,063     0,117       Philtrum Length     r     0,091     0,252     0,191     0,256       p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       Philtrum Depth     p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     0,0433     -0,010     0,031     -0,060       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       Ear Lobe Width     p     0,614     0,055     0,382     0,353       Ear Lobe Width     p     0,783     0,698     0,678     0,977	Lower Lin Thickness	r	0,046	0,205	0,223	0,189			
Philtrum Length     r     0,091     0,252     0,191     0,256       p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     0,0452     0,010     0,031     -0,060       Ear Width     r     0,043     -0,010     0,031     -0,060       Ear Lobe Length     r     0,061     -0,231     -0,106     -0,113       Ear Lobe Width     p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,614     0,055     0,382     0,353     0,698     0,678     0,977	Lower Lip Thickness	р	0,706	0,089	0,063	0,117			
p     0,452     0,036     0,113     0,032       Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     r     0,043     -0,010     0,031     -0,060       Ear Width     r     0,043     -0,010     0,031     -0,060       Ear Lobe Length     r     0,061     -0,231     0,797     0,619       Ear Lobe Width     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977     0,010	Philtrum Length	r	0,091	0,252	0,191	0,256			
Philtrum Depth     r     -0,116     -0,359     -0,216     -0,179       p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     p     0,586     0,782     0,463     0,788       Ear Width     r     0,043     -0,010     0,031     -0,060       Ear Lobe Length     r     -0,061     -0,231     0,797     0,619       Ear Lobe Width     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977     0,010		р	0,452	0,036	0,113	0,032			
Philtum Deput     p     0,340     0,002     0,073     0,138       Ear Length     r     -0,066     -0,034     -0,089     -0,033       Ear Width     p     0,586     0,782     0,463     0,788       Ear Width     r     0,043     -0,010     0,031     -0,060       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       Ear Lobe Width     p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	Bhiltrum Donth	r	-0,116	-0,359	-0,216	-0,179			
Ear Length     r     -0,066     -0,034     -0,089     -0,033       p     0,586     0,782     0,463     0,788       Ear Width     r     0,043     -0,010     0,031     -0,060       p     0,723     0,937     0,797     0,619       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       Ear Lobe Width     p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	P mili di il Depui	р	0,340	0,002	0,073	0,138			
Lai Lengtri     p     0,586     0,782     0,463     0,788       Ear Width     r     0,043     -0,010     0,031     -0,060       p     0,723     0,937     0,797     0,619       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       Ear Lobe Width     p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	Farlongth	r	-0,066	-0,034	-0,089	-0,033			
Ear Width     r     0,043     -0,010     0,031     -0,060       p     0,723     0,937     0,797     0,619       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       Ear Lobe Width     p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	Ear Length	р	0,586	0,782	0,463	0,788			
p     0,723     0,937     0,797     0,619       Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	Far Width	r	0,043	-0,010	0,031	-0,060			
Ear Lobe Length     r     -0,061     -0,231     -0,106     -0,113       p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977		р	0,723	0,937	0,797	0,619			
p     0,614     0,055     0,382     0,353       Ear Lobe Width     r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	Earl obe Longth	r	-0,061	-0,231	-0,106	-0,113			
r     -0,034     0,047     -0,051     0,003       p     0,783     0,698     0,678     0,977	Lai Lobe Lengui	р	0,614	0,055	0,382	0,353			
p 0,783 0,698 0,678 0,977	Far Lobe Width	r	-0,034	0,047	-0,051	0,003			
		р	0,783	0,698	0,678	0,977			

human source leadership trait of girls (r=-0.359; p=0.002). As the philtrum depth increases, the human source leadership trait of girls also increases.

#### **Discussion**

In a study on the facial appearance and personality traits, Kosif et al., reported that, for the girls, there were weaknegative correlation between nose height and extraversion, very weak-positive correlation between nose height and sense of responsibility, weak-positive correlation between upper face length and negative worthiness, very weak-positive correlation between lower face length and openness to innovation, a weakpositive correlation between negative worthiness and distance between the eyes, and a weak-negative correlation between compatibility/adaptability ad distance between the eyes. For the boys, the authors reported that there were strong-negative correlation between negative worthiness and facial width and weak-negative correlation between emotional inconsistency and upper face length. However, the leadership trait was not analyzed.<sup>[13]</sup> In the present study, however, no significant relationship was found between the leadership traits of male participants and their anatomic facial measurements, whereas the philtrum length and depth were found to be correlated with leadership trait among the female participants. In their study, Dimberg et al. showed the angry, happy, and neutral face photos to the participants, and the EMG activities of the faces were measured. Finally, the authors determined that both of the negative and positive emotional reactions might be evoked

unconsciously.<sup>[14]</sup> In that study, the anatomic facial measurements and leadership traits were not analyzed. In their study, Alrajih et al. investigated the facial characteristics of the businessmen and the relationship with perceived authority, reliability, aggressiveness, attractiveness, and success. They determined that the faces of businessmen provided useful information for successfully estimating the perceived authority and success characteristics and these characteristics were closely related with the face width-height ratio. The anatomic measurements performed in the study of Alrajih et al. and in the present study were different.<sup>[15]</sup> They involved only the male participants in their study and the leadership trait among the personality traits was not analyzed. In the present study, however, the leadership traits and anatomic facial measurements of participants were analyzed, but no significant result was achieved for the male participants. In their study, Turan et al. analyzed the distance and angle measurements of Turkish young adults by taking face photos from the frontal point of view, and they compared the mean results of women and men. In conclusion, they reported that, when compared to the girls, the boys were found to have a wider and higher face. The lower and upper lip thickness values of the women were found to be higher than those of men.<sup>[16]</sup> In the present study, the upper lip thickness, lower face length, and forehead width values were found to be statistically significantly higher among male participants. In this study, in which we investigated the relationship between leadership trait and facial anatomy, we also determined that there were a negative correlation between philtrum depth and human source leadership trait and positive correlations between philtrum length and human source leadership trait and between philtrum length and symbolic leadership trait.

In their study, Lewis et al. investigated the relationship of width-height ratio of all the previous USA presidents and the current president with the motivation of success, authority, decisiveness, peaceful policy, and violence, and they reported that the face width-height ratio might be related to authority and violence, as well as the motivation of success.<sup>[17]</sup> In their study, Qin et al. concluded that the personality traits of girls might be more accurately estimated when compared to the boys.<sup>[18]</sup> Borkenau et al. showed 3 different face photos to the participants and asked them to rate their personality traits. In conclusion, it was determined that the extrovert persons generally have more vivacious facial expressions.<sup>[19]</sup> In these studies, the personality traits were analyzed, but the leadership trait was not examined. Zebrowitz et al. found that, for the men, the ones defined as attractive and honest based on the shape of their faces in the early periods of their lives have personality traits that are in corroboration with those estimations made years before. For the girls, the ones defined as attractive because of the shape of their faces in the early periods of their lives have personality traits that are in harmony with the attractiveness in the course of time.<sup>[20]</sup> In the present study, no anatomic measurement was performed on the face.

In this study, we examined the relationship between facial anatomy and leadership trait. The participants were asked to take part in a 32-item questionnaire about the leadership trait. As a result of the statistical analyses, it was determined that there was no significant relationship between leadership traits and facial anatomy among the male participants. Among the female participants, however, there was a positive correlation between upper face length and human source leadership trait. Moreover, it was also determined that, among the girls, there were negative correlation between philtrum depth and human source leadership trait and positive correlations between philtrum length and human source leadership trait. Among the girls, the leadership traits were found to be correlated with the anatomic structure of face, even if the correlation was weak.

### Conclusion

In the present study, we revealed that the philtrum length and upper face length of girls might provide an insight into the leadership traits. We hope to contribute to the disciplines examining the anatomic characteristics of the face such as anatomy, psychiatry, human resources departments, information technology, forensic medicine, and anthropology.

#### **Competing Interest**

The authors declare that they have no competing interests.

#### References

- Claes P, Liberton DK, Daniels K, Rosana KM, Quillen EE, Pearson LN, et al. Modeling 3D facial shape from DNA. Plos Genetics. 2014;10:e1004224.
- Petrican R, Todorov A, Grady C. Personality at face value: Facial appearance predicts self and other personality judgments among strangers and spouses. Journal of Nonverbal Behavior. 2014;38:259-277.
- Niedenthal PM, Brauer M, Robin L, Innes-Ker A. Adult attachment and the perception of facial expression of emotion. J Pers Soc Psychol. 2002;82:419-433.
- Yan X, Andrews TJ, Young AW. Cultural similarities and differences in perceiving and recognizing facial expressions of basic emotions. Journal of Experimental Psychology: Human Perception and Performance. 2016;42:423.
- Knutson B. Facial expressions of emotion influence interpersonal trait inferences. Journal of Nonverbal Behavior. 1996;20:165-182.
- Borman H, Ozgür F, Gürsu G. Evaluation of soft-tissue morphology of the face in 1,050 young adults. Annals of Plastic Surgery. 1999;42:280-288
- Ozkoçak V, Ozdemir F. Anadolu erkeklerine ait yüz ölçümleri arasındaki ilişkinin incelenmesi. ASEAD. 2017;4:176-186.
- Onal T. Üniversite öğrencilerinin yüz antropometrik ölçümlerinin artistik anatomi açısından fotografik analiz yöntemleriyle değerlendirilmesi. Doktora Tezi, Trakya Üniversitesi Sağlık Bilimleri Enstitüsü. 2014:89s.
- Asghari A, Rajaeih S, Hassannia F, Tavakolifard N, Neisyani HF, Kamrava SK, et al. Photographic facial soft tissue analysis of healthy Iranian young adults: Anthropometric and angular measurements. Med J Islam Repub Iran. 2014;28:1-8.
- Akhter Z, Banu MLA, Alam MM, Hossain S, Nazneen M. Photoanthropometric study on face among Garo adult females of Bangladesh. Bangladesh Med Res Counc Bull. 2013;39:61-64.
- Dereli M. İlköğretim okulu müdürlerinin liderlik davranışları. Yüksek Lisans Tezi, Orta Doğu Teknik Üniversitesi Eğitim Bilimleri Enstitüsü. Ankara, 2003:87s.
- 12. Astley SJ, Stachowiak J, Clarren SK, Clausen C. Application of the

fetal alcohol syndrome facial photographic screening tool in a foster care population. The Journal of Pediatrics. 2002;141:712-717.

- Kosif R. Kişilik özellikleri ile yüz anatomisi arasındaki ilişkinin araştırılması. Kocatepe Tıp Dergisi. 2019;20:137-141.
- Dimberg U, Thunberg M, El-Mehed K. Unconscious facial reactions to emotional facial expressions. Psychological Science. 2000;11:86-89.
- Alrajih S, Ward J. Increased facial width-to-height ratio and perceived dominance in the faces of the UK's leading business leaders. British Journal of Psychology. 2014;105:153-161.
- Turan Özdemir S, Siğirli D, Ercan I, Cankur NS. Photografic facial soft tissue analysis of healthy Turkish young adults: Anthropometric measurements. Aesthetic Plastic Surger. 2009;33:175-184.
- Lewis GJ, Lefevre CE, Bates TC. Facial width-to-height ratio predicts achievement drive in US presidents. Personality and Individual Differences. 2012;52:855-857.
- Qin R, Gao W, Xu H, Hu Z. Modern physiognomy: An investigation on predicting personality traits and intelligence from the human face. Science China Information Sciences. 2018;61:058105.
- Borkenau P, Brecke S, Möttig C, Paelecke M. Extraversion is accurately perceived after a 50-ms exposure to a face. Journal of Research in Personality. 2009;43:703-706.
- Zebrowitz LA, Collins MA, Dutta R. The relationship between appearance and personality across the life span. Personality and Social Psychology Bulletin. 1998;24:736-749.