

A Study of Creating Face Photographs Set Including Different Levels of Attractiveness

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ABSTRACT

Introduction: This study was aimed to create a set of photographs including human faces with neutral expression and different levels of attractiveness that can be utilized scientifically by different disciplines and for different scopes.

Methods: In total, 186 students (120 females, 66 males) volunteered to be photographed in passport style with a neutral expression. In these pictures there was no make-up, earring, or piercing. These photographs were evaluated by the participants for the neutrality and attractiveness. The secondary sex characteristics of the faces were also assessed.

Results: Symmetrical faces were created by taking the mirror image of the right and left sides of the faces because sufficient number of photographs could not be obtained at the first stage. According to the

evaluations of these photographs by the participants, 26 attractive (13 females, 13 males) and 26 average (13 females, 13 male) faces were selected for the final set.

Conclusion: Finally, a set of 52 photographs representing human faces with neutral expression with different levels of attractiveness is developed. According to the measurement of the secondary sexual characteristics, attractive and average faces differ in terms of the width of the eyes, the nasal area, and the length of the chin. Thus, a scientific-based FaceSet including different levels of the attractiveness has been available for the use by those concerned.

Keywords: Facial attractiveness, neutral faces, face photographs set, secondary sexual characteristic, symmetry

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INTRODUCTION

Face attractiveness is subject to many scientific types of research due to its biological importance and in this context, it is known that attractive faces lead to attention and memory bias (1-3). The reward system and neural circuits associated with emotional memory and attention in the brain are activated with even just watching attractive faces (4). The perception of attractiveness was examined in both healthy and psychological/psychiatric patient groups in the literature. In this context, studies with individuals with body dysmorphic disorder (BDD) and obsessive-compulsive disorder (OCD) are remarkable (5-7). For example, studies comparing individuals with BDD and healthy control groups showed that individuals with BDD tend to consider themselves less attractive and others as more attractive. These studies show that facial attractiveness is studied for many different purposes and with different samples, and there is a need for scientific based stimulus sets that can be used in this field.

In the literature, there are many face databases are available for different purposes. These databases mainly consist of neutral and emotional face photographs (8, 9), while others consist of artificially created emotional face photographs (10). Within the scope of the available literature, any database dealing only with face attractiveness could not be reached. The stimuli used in studies on facial attractiveness are obtained a) by selecting

from the face databases created for different purposes (11, 12), b) by taking new photographs specific to that study (1, 13), c) by modifying the existing faces (morphed) (14, 15), d) by creating artificial faces (16, 17), e) by creating symmetrical versions of the existing faces (18, 19). These stimuli require a comprehensive pre-study process, even if the faces are taken from any database or prepared by the researchers themselves. The pre-study process is to take the photographs, select the appropriate ones, determine the attractiveness levels of the faces and bring them into the visual presentation form specific to the study. That is, the preparation of the set of attractive faces takes time and causes the researcher to lose time for the preparation of the main experimental manipulations; thus, it may extend the completion time of the study. Furthermore, as a result of all these preparations, there may not be an adequate number or the desired level of attractive faces, and there may be some limitations that cannot be controlled (e.g., make-up, jewelry, piercing). Therefore, the creation of a photo set that consists of neutral expressive faces and representing different levels of facial attractiveness would be a great benefit to researchers and would also eliminate a significant deficiency.

The aim of this study is to create a set of human face photographs called "Hacettepe Face Photographs Set" (HACETTEPE-FaceSet) representing different levels of attractiveness that can be used for different purposes for

researchers from different disciplines. There has been scientific attention required to control of the prepared stimuli set as much as possible in terms of confounding variables which may affect the attractiveness ratings. Because of ethical concerns (potential for awakening negative emotions due to this grouping/labeling in non-attractive faces), the face photo set includes only moderately attractive (average) and very attractive faces.

METHOD

FIRST STAGE

Stage 1 involves taking headshot photographs of the participants, converting them into a standard form (placing the face into a fixed oval frame so that the hair and ears are not visible, and making black-white), and evaluating them in terms of attractiveness and neutrality.

Participants

One hundred and eighty-six university students (120 females and 66 males) participated in the photoshoot with a neutral expression ($20,51 \pm 2,06$). However, the photographs of 104 female and 65 male participants without any make-up, earrings, and piercing were evaluated.

The neutrality and attractiveness levels of the faces were evaluated by 11 volunteers ($25,00 \pm 1,95$) who did not participate in the first stage photoshoot.

Tools

Sony VCT-60AV Tripod is used to provide a fixed distance for shooting passport photographs with a neutral expression. Photographs were taken with the *Nikon D60* digital camera. Each photo was placed in a fixed oval with a size of 250×350 pixels using *Adobe Photoshop CC* (free version) and was prepared for neutrality and attractiveness evaluations.

A 7-point Likert-type scale was used to evaluate the faces for neutrality (1: Not neutral, 7: Very Neutral) and attractiveness (1: Not Attractive, 7: Very Attractive).

Procedure

In order to carry out the study, the researchers received approval from Hacettepe University Ethics Committee, and then all participants were informed about the study.

During the photographing, the participants were asked to give a neutral expression and several pictures were taken until the desired expression was captured. The most appropriate one for the research has been selected and the other photographs that would not be used were deleted in the presence of the participant. Photographs were set in black and white, and the faces were smoothed in terms of acne, scars, and so forth. In addition, all photographs in the face-set were placed in the fixed oval frame with only faces visible. Thus, features such as hairstyle, hair color, ear structure, and skin color have been eliminated due to both the possibility of effecting facial attractiveness evaluation and the possibility of providing clues to the participant in attention and memory studies. Hence, grayscale stimuli were used for similar reasons in many studies (12, 20). Although a standard set has been obtained by making the above-mentioned procedures, the original versions of the photographs are also kept by the researchers.

After all the photographs were put into a standardized form, they were evaluated by the participants on the 7-point Likert-type scale in terms of neutrality and attractiveness levels. At the end of this evaluation procedure, almost all participants evaluated gave feedback on the fact that there were no attractive faces, and as a result of the preliminary analysis,

it was seen that all participants considered almost all the faces as being unattractive (3 out of 169 photographs were rated as very attractive). A different method was decided at this point since it was considered that there could not be enough number of very attractive faces between the selected face photographs.

SECOND STAGE

In the First Stage, it was decided to use the “symmetrical faces are attractive” information supported by the studies in the literature because a sufficient number of attractive faces could not be reached for the face-set. In this context, each photograph was split in half down the mid-sagittal plane and each half was merged with its own mirror image (with Photoshop). Thus, perfectly “left symmetrical” and “right symmetrical” artificial versions for all original faces have been created. As a result, the original, right symmetrical and left symmetrical faces were formed in a total of three sets.

Participants

The three sets of stimuli (with 169 faces per set) were rated using a 7-point Likert-type scale by a different 26 participants ($19,96 \pm 0,21$). Then, the evaluation was continued by 41 different students with only the left symmetrical faces, for the reasons mentioned in the procedure section.

Tools

The symmetrical versions of the original photographs were created using *Adobe Photoshop CC* (free version). In addition, secondary sex characteristics of selected faces for the face-set were measured using the free version of *ImageJ 1.46r* software (24).

Procedure

All the photographs were made ready for use with the same process in Stage 1 (black-whiting, placing into the oval frame and smoothing), and the participants (who signed informed consent) evaluated the photographs for neutrality and attractiveness. But, the number of photographs (507 photographs) had prolonged the evaluation process. Therefore, it was difficult to find a volunteer for evaluation. Due to a large number of photographs, most participants quit the study even though they initially volunteered. The data of the participants with incomplete evaluation were not included in the analyses. As a result, all of the photographs were rated by 26 participants. When the data were examined, it was seen that the left symmetrical photographs (this actually corresponds to the right side of the model's face) tend to be perceived as more attractive by the participants. In addition to the average faces in the set, there should be an equal number of attractive faces as much as possible. As the number of attractive faces in the original and the right symmetrical versions of the photographs is insufficient, Stage 2 was continued with the evaluation of only the left symmetrical versions (169 photographs). In this way, the loss of participants due to the long-term evaluation process was prevented. Thus, all of the photographs in the set consist of the left symmetrical faces. According to the evaluation of 41 new participants, 29% of the 169 photographs were rated as *average* with a score of 2.5 to 4.5, and 15.4% of them were rated as attractive with a score of 5 or more. Remaining unattractive photographs with a score of less than 2.5 (55.4 % of all photographs) were not included in the face-set due to the ethical concerns mentioned earlier. After excluding unattractive photographs, the distribution of attractive and average photographs was shown by a bar graph in percentiles (Figure 1). All participants evaluated the photographs of both male and female models. No information was obtained about the sexual orientation of the participants. As a result, a total of 52 photographs were selected, including attractive women, attractive men, average women, and average men categories. Examples of photographs of each category are presented in Figure 2.

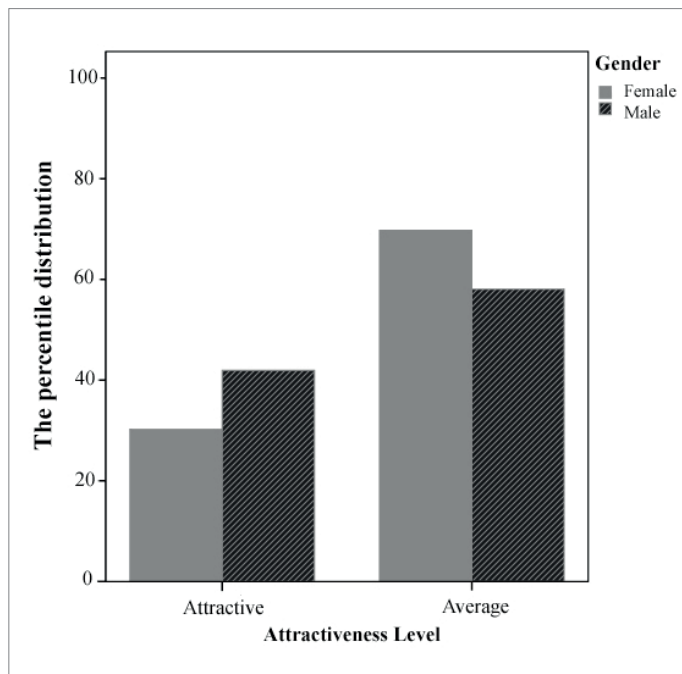


Figure 1. The percentage distribution of the attractive and average photographs by gender groups

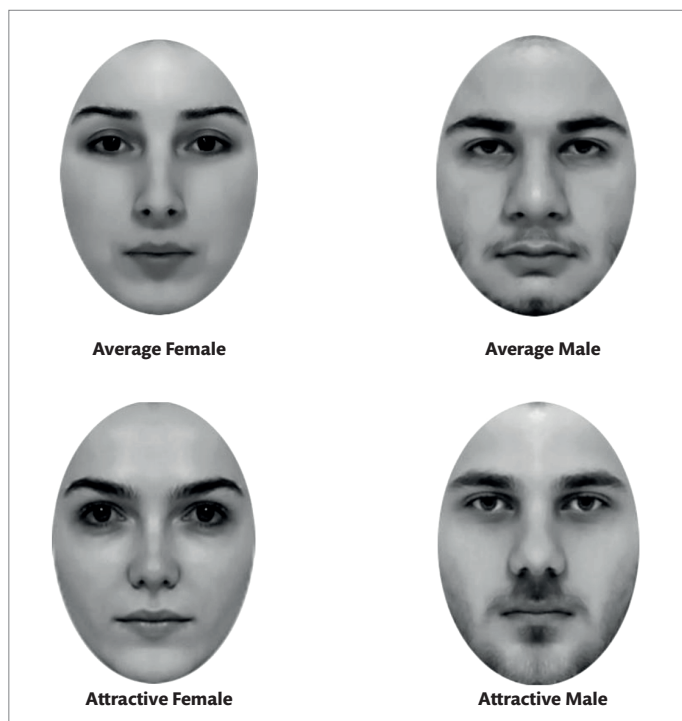


Figure 2. Samples of the male and female photographs of each category in the FaceSet (the approval of the models was obtained).

Although the symmetrical versions of faces considered more attractive than the originals ($t(103) = 2.56, p < .05$), not all of them are rated attractive (half of the face-set consists of attractive faces) even all of the faces in the set are symmetrical. The finding suggests that only symmetry may not play a role in the perception of attractiveness, and secondary sexual characteristics of the faces in the set (eye width, nasal area width, chin length, etc.) were also examined. Based on the study of Cunningham (25) and Grammer & Thornhill (26), the secondary facial characteristics of

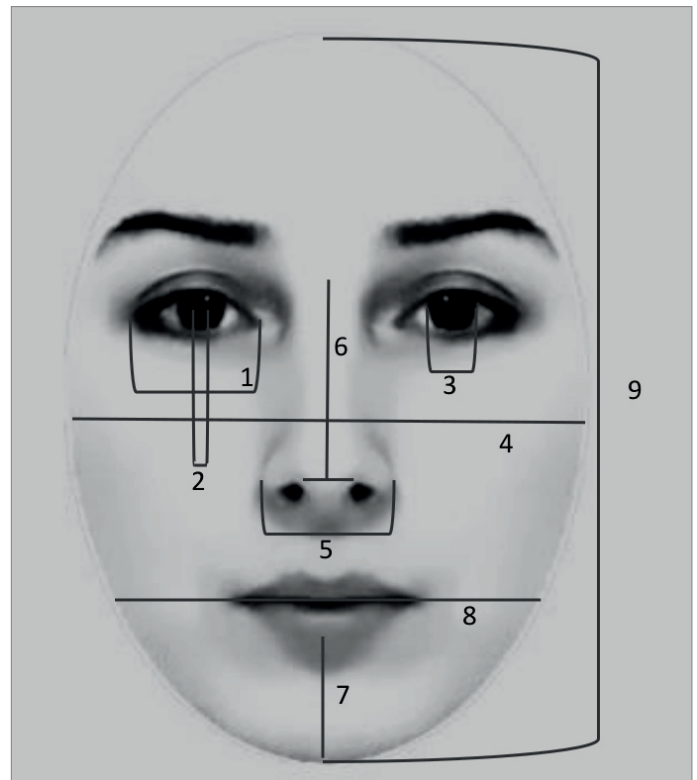


Figure 3. The parameters and schematic representation of the secondary sexual characteristics

The parameters of the secondary sexual characteristics: 1) width of eyes (distance between the inner and outer corner of the eye), 2) width of the pupil (ratio of the measured diameter of the pupil to the measured diameter of the iris - width of the face at cheekbones), 3) width of iris (measured diameter - width of the face at cheekbones), 4) width of face at cheekbones (distance between the right and the left of the face at cheekbones), 5) width of the nose (width of nose at outer edges of nostrils at widest point), 6) length of the nose (measured from forehead bridge at level of upper edge of visible eye to nose tip), 7) length of the chin (distance from lower edge of lower lip to base of chin - length of face), 8) width of face at mouth (distance between the right and the left of the face at mouth), 9) length of the face (distance from top of the forehead to base of chin), 10) nose area (the product of the length of the nose and width of the nose - length of the face), 11) cheekbone prominence (difference between the width of the face at the cheekbones, and the width of the face at the mouth - length of the face). A photograph in the FaceSet that approval by the model is used as a background.

the attractive and average female/male faces were measured using the *ImageJ 1.46r* software (Figure 3).

All participants who were photographed in the first and second stage of the study have given a written and signed approval for the use of their photographs within the scope of a photo set or face database for scientific purposes.

RESULTS

The face-set consists of a total of 52 black and white, symmetrical, and neutral expressed headshot face photographs of which 26 attractive (13 females, 13 males) and 26 average (13 females, 13 males). These faces were evaluated as highly neutral by participants (Table 1).

The difference in the levels of the neutrality and attractiveness between the attractive and average faces was evaluated with the *Mann Whitney U test* because of the small sample size and non-normal data distribution. According to the results of neutrality, there is no statistically significant difference between the attractive (*Median* = 6.10) and the average (*Median* = 6.08) photographs, $U = 319.00, z = -.35, p > .05$. In the determination of the attractiveness level, it was taken as the basis to get 5 or more points from the 7-point Likert-type scale for the attractive faces and to get a score of 2.5 to

Table 1. The mean ratings of the photographs in the FaceSet for the levels of the neutrality

	FEMALE		MALE	
	Attractive	Average	Attractive	Average
1	6.1	6.24	6.24	6.37
2	6.2	6.1	6.3	6.24
3	6.03	6.72	6.37	6.03
4	5.86	6.1	5.68	6.35
5	6.13	6.51	6.31	5.92
6	6.1	6.06	6	6.24
7	6.2	6.31	6.62	6.03
8	6.1	6.03	5.65	5.89
9	6.55	5.89	5.68	6.1
10	6	6.03	6.27	5.89
11	6.03	5.89	6.34	6.27
12	5.93	6	5.89	5.06
13	6	6.58	5.96	6.03

Table 2. The mean ratings of the photographs in the FaceSet for the levels of the attractiveness

	FEMALE		MALE	
	Attractive	Average	Attractive	Average
1	6	2.81	5.27	2.81
2	5.09	2.84	5	3.06
3	6.11	3.06	6	3
4	5.95	3.03	6.01	3.03
5	6	3	5.87	3
6	6.05	3.03	6.03	3.03
7	5.87	2.69	6	2.69
8	5.87	3.03	5.72	3.03
9	6	3.06	6.03	3.06
10	6.05	3	5.93	3
11	5.85	3	6.03	3
12	5.88	3.39	5.96	3.39
13	5.27	3.06	5	3.06

4.5 range for the average faces. The findings of the level of the attractiveness are shown in Table 2. According to the results of attractiveness, there is a statistically significant difference between the attractive (Median= 5.95) and the average (Median= 3.03) photographs, $U = .000$, $z = -6.21$, $p < .001$, $r = .86$.

When the consistency score between photographs in attractive and average categories is measured with *Cronbach's Alpha*, it is shown that the consistency between attractive photographs is .94; the consistency between the average photographs is 0.65. Inter-rater reliability has also been examined. In the study of Bikmaz-Bilgen and Doğan (2017), the techniques of the Kappa statistic, log-linear analysis, and *Krippendorff Alpha* were used to determine the inter-rater reliability between 2, 5 and 10 raters. Analyzes showed that the reliability level decreased as the number of raters increased (27). In this study, the provided *Krippendorff Alpha* analysis shows low scores since the number of raters is quite high (41 raters). When the reliability score is measured with the *interclass correlation coefficient*, it is shown that the inter-rater reliability is .89 for attractive photographs, and .67 for average ones. Considering that the number of raters is quite high, these scores can be considered as high too.

The created stimulus set is called Hacettepe- Face Photographs Set Including Different Levels of Attractiveness (HACETTEPE-FaceSet).

The photographs in the HACETTEPE-FaceSet were evaluated in terms of secondary sexual characteristics. Some objective parameters, which are commonly used in the literature and presented in Figure 2, are used for the measurement. The measurements of the secondary sexual characteristics of the attractive and average faces were compared with the *Mann Whitney U test*. Mean values for each measurement and the levels of significance are shown in Table 3. According to the results, it was observed that attractive female faces had larger eyes, smaller nasal area, and a smaller jaw than average female faces. Attractive male faces had also larger eyes and a smaller nasal area than average male faces (Table 3).

DISCUSSION

Scientific studies on facial attractiveness are increasing. Studies show that attractive faces attract attention automatically (1, 13, 28, 29) and are more easy to remembered (30). On the other hand, more positive characteristics are attributed to the individuals which perceived as attractive (31). When the clinical studies are considered, the studies about individuals with body dysmorphic disorder (BDD) are more prominent. For example; Buhlmann et al. (5) and Buhlmann et al. (6) used attractive and unattractive face photographs (including the participants' own headshot photographs) in their studies comparing the participants with BDD with healthy ones. As a result, it is seen that the participants with BDD consider their photographs as less attractive than the average and

Table 3. The measurement of the secondary sexual characteristics of the photographs in the FaceSet

	FEMALE			MALE		
	Attractive	Average	Sig.	Attractive	Average	Sig.
Width of the eyes	1.68	1.58	$p < 0.01$	1.44	1.43	<i>n.s.</i>
Width of the pupil	0.05	0.04	$p < 0.01$	0.04	0.03	$p < 0.01$
Nose area	0.24	0.29	$p < 0.05$	0.21	0.29	$p < 0.01$
Cheekbone prominence	0.14	0.13	<i>n.s.</i>	0.12	0.11	<i>n.s.</i>
Length of the chin	0.17	0.19	$p < 0.01$	0.2	0.19	<i>n.s.</i>

consider other photographs more attractive than the average. Healthy participants generally consider their photographs as average. In the study of Buhlmann et al (6), it is also shown that there is no difference between the participants with OCD and the healthy ones on the assessment of the attractiveness.

Facial attractiveness is studied with different samples for different purposes. However, although there are some face-sets/databases in the literature, a known database which is suitable for the facial attractiveness studies could not be reached. The stimuli prepared by the researchers choosing from different face-sets or taking new photographs are often used in studies. Therefore, the presence of a scientifically-based facial set, which is classified in terms of the level of attractiveness, the ready-to-use, and excluded from confounding variables as far as possible, is useful for the researchers. With a ready-to-use set, researchers will be able to focus on their main study rather than losing time with pre-studies and creating a new face-set.

The present study is important not only for a face-set has been created, but also for indicating that symmetry may not be effective alone in facial attractiveness. Symmetrical faces especially provide more advantageous if the face of the opposite sex should be preferred (21). There are studies showing that artificially symmetrical faces are perceived as both more attractive (18) and less attractive (24) than original faces. According to Rhodes et al. (19), these inconsistencies may be caused by differences in methods of creating symmetrical faces. The features of the midline of the face, such as the nose, can be unusually narrow or broad in artificially created perfect symmetrical faces. The photographs in the HACETTEPE-FaceSet consist of left symmetrical faces which of the left half was merged with its own mirror image. Although these photographs are rated more attractive than the original versions, one-to-one comparisons of the original faces and symmetrical versions shows that the symmetrical faces are not always more attractive. Meanwhile, all photographs in the HACETTEPE-FaceSet are symmetrical, but they are not all attractive. Therefore, it was thought that secondary sexual characteristics might have played a role in the perception of facial attractiveness. In previous studies, large eyes and fleshy lips in women and the wider jaw in men were perceived as attractive due to youth and health indicator (28). The fact that all symmetrical faces in the present study are not rated as attractive may also be due to secondary sexual characteristics. The analysis of secondary sexual characteristics showed a significant difference between attractive and average faces as consistent with the previous findings. The present study is valuable because it shows that symmetry does not play a role in the perception of attractiveness alone.

There are also some limitations of the HACETTEPE-FaceSet. One of them is that there are not unattractive photographs because of ethical concerns. Most of the male models are also bearded. Therefore, the results of attention and memory studies should be interpreted with care. In addition, the black-white and symmetric versions (artificially) of the photographs create limitations on ecological/external validity.

Ethics Committee Approval: The approval of the Senate Ethics Committee (approval dated 03.10.2013 and numbered 4697) was obtained from the university where the study was conducted.

Informed Consent: The participants were informed about the purpose of the study and the area of use, and informed consent was obtained from the participants.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - ÖEK; Design - ÖEK, BC; Supervision - ÖEK, BC; Resource - ÖEK, BC; Materials - ÖEK, BC; Data Collection and/ or Processing - ÖEK; Analysis and/or Interpretation - ÖEK, BC; Literature Search - ÖEK; Writing - ÖEK, BC; Critical Reviews - ÖEK, BC.

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REFERENCES

- Duncan LA, Park JH, Faulkner J, Schaller M, Neuberg SL, Kenrick DT. Adaptive allocation of attention: effects of sex and sociosexuality on visual attention to attractive opposite-sex faces. *Evol Hum Behav* 2007;28:359–364. [CrossRef]
- Nakamura K, Kawabata H. Attractive faces temporally modulate visual attention. *Front Psychol* 2014;5:620. [CrossRef]
- Wiese H, Altmann CS, Schweinberger SR. Effects of attractiveness on face memory separated from distinctiveness: Evidence from event-related brain potentials. *Neuropsychologia* 2014;56:26–36. [CrossRef]
- Aharon I, Etcoff N, Arieli D, Chabris CF, O'Connor E, Breiter HC. Beautiful Faces Have Variable Reward Value: fMRI and Behavioral Evidence. *Neuron* 2001;32:537–551. [CrossRef]
- Buhlmann U, Etcoff NL, Wilhelm S. Facial attractiveness ratings and perfectionism in body dysmorphic disorder and obsessive-compulsive disorder. *J Anxiety Disord* 2008;22:540–547. [CrossRef]
- Buhlmann U, Teachman BA, Kathmann N. Evaluating implicit attractiveness beliefs in body dysmorphic disorder using the Go/No-go Association Task. *J Behav Ther Exp Psychiatry* 2011;42:192–197. [CrossRef]
- Mulkens S, Jansen A. Mirror gazing increases attractiveness in satisfied, but not in dissatisfied women: A model for body dysmorphic disorder? *J Behav Ther Exp Psychiatry* 2009;40:211–218. [CrossRef]
- Ekman P, Friesen WV. Measuring facial movement. *Nonverbal Behav* 1976;1:56–75. [CrossRef]
- Ma Q, Hu Y, Jiang S, Meng L. The undermining effect of facial attractiveness on brain responses to fairness in the Ultimatum Game: an ERP study. *Front Neurosci* 2015;9:1–9. [CrossRef]
- Matheson HE, McMullen PA. A computer-generated face database with ratings on realism, masculinity, race, and stereotypy. *Behav Res Methods* 2011;43:224–228. [CrossRef]
- Chen W, Liu CH, Nakabayashi K. Beauty hinders attention switch in change detection: The role of facial attractiveness and distinctiveness. *PLoS ONE* 2012;7:e32897. [CrossRef]
- Tsukiura T, Cabeza R. Remembering beauty: Roles of orbitofrontal and hippocampal regions in successful memory encoding of attractive faces. *Neuroimage* 2011;54:653–660. [CrossRef]
- Maner JK, Gailliot MT, Rouby DA, Miller SL. Can't take my eyes off you: Attentional adhesion to mates and rivals. *J Pers Soc Psychol* 2007;93:389–401. [CrossRef]
- Busey TA. Physical and Psychological Representations of Faces: Evidence From Morphing. *Psychol Sci* 1998;9:476–483. [CrossRef]
- Valuch C, Pflüger LS, Wallner B, Laeng B, Ansorge U. Using eye tracking to test for individual differences in attention to attractive faces. *Front Psychol* 2015;6:1–13. [CrossRef]
- Chatterjee A, Thomas A, Smith SE, Aguirre GK. The neural response to facial attractiveness. *Neuropsychology* 2009;23:135–143. [CrossRef]
- Said CP, Todorov A. A Statistical Model of Facial Attractiveness. *Psychol Sci* 2011;22:1183–90. [CrossRef]
- Mealey L, Bridgstock R, Townsend GC. Symmetry and perceived facial attractiveness: a monozygotic co-twin comparison. *J Pers Soc Psychol* 1999;76:151–158. [CrossRef]
- Rhodes G, Proffitt F, Grady JM, Sumich A. Facial symmetry and the perception of beauty. *Psychonomic Bull Rev* 1998;5:659–669. [CrossRef]
- Sui J, Liu CH. Can beauty be ignored? Effects of facial attractiveness on covert attention. *Psychonomic Bull Rev* 2009;16:276–281. [CrossRef]
- Penton-Voak IS, Jones BC, Little AC, Baker S, Tiddeman B, Burt DM, Perrett DI. Symmetry, sexual dimorphism in facial proportions and male facial attractiveness. *Proc Biol Sci* 2001;268:1617–1623. [CrossRef]
- Swaddle JP, Guthill IG. Asymmetry and human facial attractiveness: symmetry may not always be beautiful. *Proc Biol Sci* 1995;261:111–116. [CrossRef]
- Thornhill R, Gangestad SW. Human Fluctuating Asymmetry and Sexual Behavior. *Psychol Sci* 1994;5:297–302. [CrossRef]
- Ferreira T, Rasband W. ImageJ User Guide: IJ 1.46r, 2012. Available at: <https://imagej.nih.gov/ij/docs/guide/user-guide.pdf>
- Cunningham MR. Measuring the physical in physical attractiveness: Quasi-experiments on the sociobiology of female facial beauty. *J Pers Soc Psychol* 1986;50:925–935. [CrossRef]
- Grammer K, Thornhill R. Human (*Homo sapiens*) facial attractiveness and sexual selection: the role of symmetry and averageness. *J Comp Psychol* 1994;108:233–242. [CrossRef]

27. Bıkmaz-Bilgen Ö., Doğan N. The Comparison of Interrater Reliability Estimating Techniques [In Turkish]. *Journal of Measurement and Evaluation in Education and Psychology* 2017;8:63-78. [\[CrossRef\]](#)
28. Ertan Ö. Effect of automatic attention on change detection performance in the context of facial attractiveness [In Turkish]. Unpublished Master's Thesis. Hacettepe University; 2015.
29. İyilikci O, Ertan Ö. Investigating the Attentional Bias Caused by Facial Attractiveness in the Attentional Blink Process. [In Turkish]. *Turkish Psychological Articles* 2012;15:53-60.
30. Mihalache S, Mihaela-Stoica M-Z. Facial Recognition. *EIRP Proceedings*, 9th ed. 2014;9. pp.452-456.
31. Langlois JH, Kalakanis L, Rubenstein AJ, Larson A, Hallam M, Smoot M. Maxims or Myths of Beauty? A Meta-Analytic and Theoretical Review. *Psychological Bulletin* 2000;126:390-423. [\[CrossRef\]](#)