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Influence of age on perception of asymmetry

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Abstract

Introduction: The perception of a face is subjective and it can vary with age, therefore the features in a face acceptable to a youngster and an adult might be different. As a result, achieving satisfactory results can be a challenge owing to the different requirements for different age groups. The aim of the study was to assess the agreement of subjective evaluation of mandibular asymmetry between the laypersons belonging to different age groups.

Material and methods: 60 laypersons fulfilling the inclusion criteria were selected and divided into two groups, 30 observers in each. The mean age of the observers was 15.4±1.13 years (14-17years) and 49.7±8.6 years (31 and above) in group 1 and 2 respectively. The observers were shown 43 photographs of patients with varying degree of mandibular asymmetry. Each rater determined the presence or absence of asymmetry and stated whether the asymmetry if present is within acceptable range or whether it necessitates correction and a score of 0, 1 or 2 was given accordingly. The data was analyzed using SPSS version 16.0.

Results: The difference in mean score given by both groups was statistically insignificant with a p value of 0.7. There was substantial agreement between both the groups as shown by the kappa value (0.738).

Conclusions: Age did not influence the perception of asymmetry however; the males were more sensitive to the presence of facial imbalance.

Keywords: chin; deviation; layperson

Introduction

Facial symmetry is the balance and equality of proportions of both sides of the face.[1] Facial balance has been associated with beauty and the studies on natural selection have concluded that there is preference for a well-balanced face when selecting a mate.[1-3] Over a period of time there has been an increase in both young and older orthodontic patients. Most of them report with the intention of improving their esthetics as well as to become acceptable to the society.[4]

Perfectly symmetrical face rarely exists and it is not recognized easily by a lay person but in some cases the imbalance will be significant enough to have a negative impact on the self-esteem and social life of an individual. [5, 6] Such cases warrant correction of the deviation which necessitates surgical intervention,[7] Since orthognathic surgeries are associated with considerable amount of risks, it is of paramount importance to determine the need for surgical correction of lateralization. To what extent can the law of proportionality in a face be disregarded is what needs to be explored. Numerous studies have reported a development in perception and recognition of a face until adulthood following which

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gradual decline is seen as a person ages therefore a youngster may not see the face same as seen by an older person.[8] The self-confidence of an individual depends on how the society understands and acknowledges a person.[9] The aim of the study was to assess the level of agreement between the laypersons belonging to different age groups. The information gained can be used to plan according to the patient's requirements and this will also help in preventing the orthodontists from subjecting the patients to unnecessary surgeries.

Material and Methods

Approval of the Ethical Committee of Riphah International University and consent of the participants was taken. Using non probability consecutive sampling method total of 60 observers, 14 years and above, were recruited according to the inclusion criteria which was either gender, with no history of previous orthodontic treatment, having no training in the field of medicine, dentistry or arts. The raters were divided into two groups, 30 observers in each, in group 1 the mean age of the observers was 15.4±1.13 years (14-17years) and in group 2 the mean age was 49.7±8.6 years (31 and above)

Patients having varying degree of mandibular asymmetry with no other discernable asymmetry (up to 3mm of deviation if present) were selected. Full face frontal photographs of the patients with blue background were taken with Canon A810 Camera (Canon Inc. Tokyo, Japan) with standardized lighting. The head of each patient was stabilized with a cephalostat (AJAT, Finland) to achieve standard positioning with the camera fixed on a tripod at a distance of 5 feet from the patient. The lighting was kept the same, with the angulation of the camera parallel to the floor and the height of the camera at the level of subnasale. The patients were instructed to occlude the teeth in maximum intercuspation. Further on the female participants were instructed to tie their hair back and those who preferred to wear head scarves were asked to expose their ears at least. The male participants selected were clean shaven.

Each photograph was edited with a photo editing software (Adobe Photoshop CS6) to obtain a uniform skin tone and remove blemishes to avoid distractions which can result in a biased opinion.

Black and white photographs were displayed as a power point presentation on a laptop (Dell Vostro 3400). Each photograph was displayed for 10 seconds to maintain standardization. The raters were asked to fill a questionnaire and had to ascertain whether the face was:

I. symmetrical
II. had asymmetry within acceptable range
III. had severe asymmetry, which required correction state

A score of 0 was given if no asymmetry is detected, score of 1 was given if the asymmetry detected is within acceptable range and 2 was given if treatment is recommended. Each group had to rate the 43 photographs and their scores were then compared to determine whether there is any agreement between the two age groups.

Data analysis was carried out using Statistical Package for the Social Sciences (SPSS version 16.0, Chicago, SPSS Inc.). For the scores assigned to each photograph, mean and standard deviation was calculated. An independent t- test was used to compare both the groups. The level of agreement between group 1 and group 2 was evaluated using kappa test. The p value less than 0.05 was considered as statistically significant.

Results

The difference in mean score by group 1 and group 2 was statistically insignificant with a p value of 0.7 (table I). There was substantial agreement between both the groups as shown by the kappa value (0.738), (table II and table III). The mean score given by the male and female judges was 1.7±0.2 mm and 1.6 ± 0.16 mm respectively with p value of 0.03, showing statistically significant difference (table IV, Figure I).

Table I: Mean scores for group 1 and group 2

Group Statistics						
	AGE GROUP	N	Mean	Std. Deviation	Std. Error Mean	P value
mean	Group 1	30	1.7419	.20092	.03668	0.7
	Group 2	30	1.6457	.20095	.03669	

Table II: Strength of agreement between group 1 and group 2

Symmetric Measures					
		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Measure of Agreement	(Kappa)	0.738	0.098	6.055	.000

Table III: Cross tabulation for group 1 and group 2

group 1 * group 2 Cross tabulation					
Count					
		group 2			
		symmetrical	asymmetry within acceptable range	needs correction	Total
group 1	symmetrical	11	0	0	11
	asymmetry within acceptable range	6	23	0	29
	needs correction	0	0	3	3
Total		17	23	3	43

Table IV: Mean values for gender

Gender	N	mean	St deviation	p
Male	30	1.7	0.2	0.03
female	30	1.6	0.16	

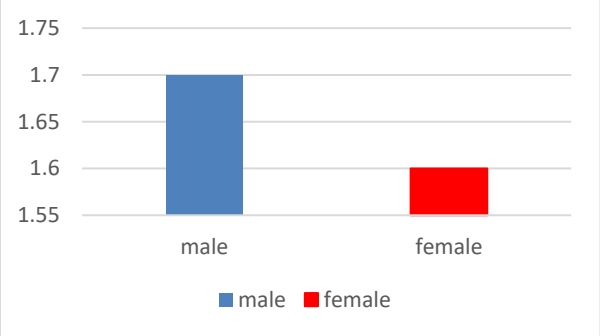

Figure 1: Mean score given by males and females

Discussion

Numerous studies have reported the difference in sensitivity to presence of facial disparity between professionals and non-professionals but to our knowledge there is dearth of data regarding the effect of the raters' age on perception of attractiveness and asymmetry.

In this study equal number of young (mean age 15.4±1.13years) and old participants (mean age 49.7± 8.6years) were selected and were asked to rate 43 photographs with varying amount of asymmetry. The purpose of this study was to ascertain whether any difference in sensitivity to laterality exists among the different age groups.

Different methods have been used to obtain images to compare the ability to recognize asymmetry, the 3 dimensional images used in some studies have the disadvantage of high cost, similarly postero-antero cephalograms exposes an individual to radiation, a 2 dimensional image can be acquired by constructing a computerized image which can then be modified to different degrees of asymmetry, however, these images are not realistic images and interpretation of such images can be misleading.[10] In our study considering the shortcomings of these methods frontal photographs of patients with facial asymmetry of varying degrees were used which are easy to obtain and more realistic as well.

Some of the studies that have assessed the impact of the observer's age on perception of face used computerized images as a stimulus and compared the opinion in terms of facial attractiveness by introducing different levels of asymmetry. Cross and Cross determined the influence of the observers' age on aesthetic perception, the judges were divided into four groups: 7, 12, and 17year-old and adults between the ages of 30 to 50 years. No difference was noted between the 4 groups.[11]

According to Saxton the adolescents prefer symmetrical over asymmetrical faces with the older adolescents (13-14years) being more critical compared to the young adolescents.[12]

On the contrary Anas et al conducted a study analyzing the effect of the observer's age on the 3 dimensional facial perception. They concluded that the age had no role in influencing the opinion of an individual, the difference in results can be attributed to the fact that the subjects recruited in the study were all adults (25-55years).[13]

Lariss and Daphne evaluated the influence of age and maturity on appreciating asymmetry and its effect on facial attractiveness of 5 year old, 9 year old and adults age 18-25, the study concluded that the 9year olds and the adults were more critical to presence of asymmetry as compared to the 5 year olds with the adults being more sensitive.[11] The difference in observation may be explained by the fact that, face recognition ability does not develop until adolescence, it persists in adulthood but a decline is seen during the older age.[14-16]

In our study Group 1 gave a mean score of 1.7±0.2 and group 2 gave a mean score of 1.6±0.2, the difference was statistically insignificant between the two groups, (p value 0.7), also the kappa value which was 0.7 showed substantial agreement between the two groups. The results of our study support the notion that the peak maturity level in terms of facial recognition is achieved early and these levels persist through out adulthood, therefore the young and the adults have same ability to recognize the face and detect any deviation from the norm.

On the contrary a study by Sean Marcy which compared the perception of asymmetry between orthodontists and laypersons and the effect of age on the perception, reported, young judges were more critical as compared to the older judges both in the professional and laypersons group. The difference in observation can be due to the difference in methodology.[1]

Similar to other studies the male observers in our study were more sensitive to asymmetry (mean 1.7±0.2) as opposed to female raters (mean 1.6±0.16). One explanation for the difference is the structural and the functional variability of the higher centers in both the genders.[17, 18]

No attempt was made to address the difference is visual acuity of the raters. The difference in vision could have resulted in a biased result with some raters being able to detect small degree of deviation.

It is difficult to control other facial features that can have profound influence on the perception of the raters.

Conclusions

The perception of esthetics is subjective and it depends not only on the cultural differences but varies between individuals due to the diversity of the observer's attributes including the age. The purpose of this study was to determine if there was any difference between the young and the old observers in recognizing facial asymmetry. Age did not influence the perception of asymmetry however; males were more sensitive to the presence of facial imbalance.

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