



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY HEALTH SCIENCES

ISSN: 2394 9406

Perception of Facial Esthetics among Orthodontic Professionals and Lay Person

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Abstract

Introduction: The facial profile is a significant feature when determining facial attractiveness. A person's ability to recognize a beautiful face is innate, but translating this into defined treatment goals is problematic. The perception of beauty is an individual preference with cultural bias. Artists and health professionals have attempted to define and recreate an ideal. As health professionals have increased their ability to change faces, the necessity to understand what is and is not beautiful has intensified.

Aim: To compare the perception of orthodontists and lay persons on computer modified profile by using adobe Photoshop.

Material & Methods: Facial image of a 23 year old female subject with no orthodontic treatment, who fulfilled the criteria of soft tissue normative value and balanced smile, was obtained. The photograph was manipulated using adobe Photoshop. Twelve photographs were randomly distributed in two groups of raters of 30 orthodontists and 30 lay persons, who scored the attractiveness of the photographic variations using visual analogue scale.

Conclusion: Orthodontists were found to be more sensitive than laypersons when scoring altered facial esthetics. The perception of orthodontists differed from the perceptions of laypersons regarding symmetrical alterations of the soft tissues.

Result: Overall result of this study shows that, as the increments are increased or decreased the scores given by orthodontic and lay persons differ. The Results of both the tests (irrespective of sex) show that when we compare scores given by the orthodontist and layperson, orthodontists have given fewer score ($p<0.05$).

Keywords: facial esthetics, lay person, orthodontic professionals, perception.

Introduction:

Physical attractiveness is an important social issue in our culture and the face is one of its key features¹. Several authors have reported hierarchies in the characteristics that determine the aesthetic perception of a person, with the face being the most important factor. Within the face, the mouth (31%) and eyes (34%) also appear to be important. Since the patient's decision to undertake orthodontic treatment is based primarily on esthetic considerations⁷, the evaluation and understanding of the factors that influence their decision is of key importance to the completion of orthodontic treatment⁷. As a result, a detailed esthetic judgment of the face should be carried out using the patient's frontal face view, during conversation, their facial expression and smiling¹.

The facial profile is an significant feature when determining facial attractiveness. Orthodontists assess the facial profile to clinically judge the facial harmony of orthodontic patients⁴; but how aware are the public of their facial profile? Moreover, do patient's views and expectations of facial attractiveness coincide with the professionals' opinions? The evaluation of facial esthetics or attractiveness is mainly subjective and interpretation of previous subjective reports, similar to other orthodontic subject matters that used subjective measurements, can be challenging. Apparently, Angle admitted that no measurement can be universally applied to estimate the harmony and disharmony of faces. Research has shown that laypersons range of acceptable facial profiles is wider than that of the professional groups³.

Psychological benefits of orthodontic treatment, done to improve appearance, revolve around gaining a more positive self-image and more favorable responses in future interpersonal situations, which can be only achieved if the patient is satisfied after the treatment. Facial profile self-awareness can raise the orthodontic patient's post treatment satisfaction. This is because their decisions during the treatment plan will also be influenced by their own perceptions once they have become aware of their profiles, hence reaching better satisfaction and indeed a more positive self-image.

Ackerman and Profit provided clinical guidelines for facial profile esthetics. As with all clinical judgments, an element of subjectivity in one's perception of an esthetic profile would be expected¹². However, the perceptions of patients might not be consistent with those of clinicians, so that patients' subjective responses about facial esthetics should be of interest to orthodontists. Such information could facilitate communication between clinicians and patients.

Hence now days, people seek orthodontic treatment to achieve pleasing esthetic facial profile but patient's perception of an attractive face differs from an orthodontist⁶. Hence the study was undertaken to determine how aware the individuals are of their own profile and to compare the orthodontists' perception of an attractive facial profile with those of lay people.

A person's ability to recognize a beautiful face is innate, but translating this into defined treatment goals is problematic. Recognizing beauty is not practiced nor is it difficult. The perception of beauty is an

individual preference with cultural bias. Rules governing why a face is beautiful are not understood nor are required for anyone to say that a face is beautiful. Artists and health professionals have attempted to define and recreate an ideal. They recognize beauty, yet objective standards are difficult, despite unending attempts to clarify this concept. As health professionals have increased their ability to change faces, the necessity to understand what is and is not beautiful has intensified. As an initiative, only female photographs were taken for this study. Further studies need be done using both male and female photographs.

Aim:

The aim of the study was to compare the perception of orthodontists and lay persons on computer modified profile by using adobe Photoshop.

Materials and Methods:

We selected a 'not-well-known' subject, preferably female gender due to more esthetic concerns and most common gender for orthodontic treatment. Facial image of a 23 year old female subject with no orthodontic treatment, who fulfilled the criteria of soft tissue normative value and balanced smile, was obtained. The subject was then taken for a digital photograph, using Sony Cyber shot DSC-HX200V with flash at 5-feet distance. The subject was asked to focus on distant point to reproduce natural head position. The photograph was manipulated by using adobe Photoshop version 8.

The adobe Photoshop software was used to obtain increase in upper and lower lip elongation by increments of +2 to +3mm, protrusion of chin by increment of +2 to +3mm and retrusion of chin by

increments of -2 to -3mm, flattening of nose by increments of -2 to -3mm and prominence of nose by increments of +2 to +3mm, flattening of cheek by increments of -2 to -3mm and prominence of cheek by increments of +2 to +3mm and increase in width of alar base by increments of +2 to +3mm and decrease in width of alar base by increments of -2 to -3mm. Twelve photographs (two normal plus ten modified) were randomly distributed in a binder of two groups of raters 30 orthodontists(15 male and 15 female) and 30 lay persons not linked to the dental area nor to any artistic activity (15 male and 15 female) who scored the attractiveness of the photographic variations using visual analogue scale (VAS) the age group selected was between 20 to 30 years of age.

The individual agreed to participate in the study signed a consent form that stated the research objective and modification of photographs. In the consent form, participant also authorized the disclosure of facial photograph for teaching and research.

Statistical Analysis

The chi-squared test was used to investigate the associations of gender differences and experience with orthodontic treatment.

t-test followed by the Scheffe' method was used to analyze the difference of degree of perception among groups of assessor.

Result

Overall result of this study shows that, as the increments are increased or decreased the scores given by orthodontic and lay persons differ.

The results of both the tests (irrespective of sex) show that when we compare scores given by the orthodontist and layperson,

orthodontists have given fewer score ($p<0.05$).

We have also found out that there is difference in score of male and female laypersons. Males have given more score to lower lip elongation, increased alar base, decreased alar base and cheek flattening compared to female laypersons.

In case of upper lip elongation, retrusion of chin and retrusion of nose there is no significant difference between the score ($p>0.05$)

There is no significant difference between the score of female and male orthodontist ($p>0.05$). Though female orthodontists have given more score to decreased alar base and male orthodontist have given more score to protrusion of nose and retrusion of nose.

Discussion

First, it was that overlying soft tissue was considered a major component for determining esthetics. It has even more impact on the facial beauty than those of skeletal in some studies. The most common reason is that people see the ‘face’, not the ‘underlying skeletal’. Hence, it would be more intuitive to study on the soft tissue.

Second, critics may consider radiographic approach ‘invasive’ and time consuming for conducting a research. With the development of digital imaging, photograph is considered most appropriate and practical in this regard. As one of the major aspects for orthodontic diagnosis and treatment planning, facial perception is believed to be the best and practical measure available to represent an abstract issue like facial esthetics. Hence, it was used as a tool in this study to compare perception among various groups of assessors.

The results of the current study bring to light the perception of facial profile among orthodontist and laypersons. Two groups of raters were used in this study:

Orthodontist and laypersons. When we compare scores given by the orthodontist and layperson, orthodontists have given fewer score.

We have also found out that there is difference in score of male and female laypersons. Males have given more score to lower lip elongation, increased alar base, decreased alar base and cheek flattening compared to female laypersons

In case of upper lip elongation, retrusion of chin and retrusion of nose there is no significant difference between the score. There is no significant difference between the score of female and male orthodontist. Though female orthodontists have given more score to decreased alar base and male orthodontist have given more score to protrusion of nose and retrusion of nose.

Lower lip elongation and increased alar base were found to be more attractive to male laypersons, whereas cheek prominence and cheek flattening were found to be unattractive in case of both male and female laypersons. According to orthodontist both male and female chin protrusion and cheek flattening were found to be unattractive.

Conclusion

The purpose of study was to compare the perception of orthodontist and lay person on computer modified profile by using adobe Photoshop

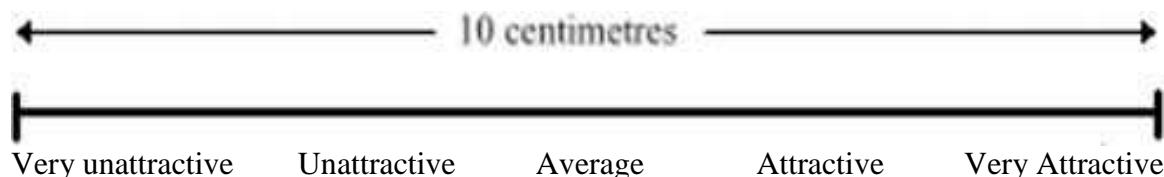
1. Orthodontists were found to be more sensitive than laypersons when scoring altered facial esthetics.
2. The effect of gender on visual judgment of facial perception was significantly different in case of male and female laypersons.
3. The perception of orthodontists differed from the perceptions of laypersons regarding symmetrical alterations of the soft tissues.

4. Lower lip elongation was found to be most attractive in male laypersons.
5. We found that orthodontist tended to concentrate more on function than esthetics and stability whereas laypersons assessors concerned more about esthetics.
6. Female orthodontists have given more score to decreased alar base and male orthodontists have given more score to protrusion of nose and retrusion of nose.

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**Fig. 1 Visual Analog Scale****T-test group statistics**

Parameters	Person	N	Mean	Standard deviation	P
Upper Lip Elongation	Orthodontist	30	4.15	0.36	0.333
	Laypersons	30	4.05	0.67	
Lower Lip Elongation	Orthodontist	30	4.00	0.71	0.243
	Laypersons	30	4.10	0.87	
Increased Alar Base	Orthodontist	30	4.10	0.65	0.233
	Laypersons	30	4.05	0.53	
Decreased Alar Base	Orthodontist	30	4.00	0.69	0.122
	Laypersons	30	4.05	0.23	
Chin Prominence	Orthodontist	30	4.10	0.31	0.324
	Laypersons	30	4.20	0.76	
Chin Retruson	Orthodontist	30	3.05	0.56	0.07
	Laypersons	30	3.10	0.81	
Cheek Prominence	Orthodontist	30	3.20	0.57	0.212
	Laypersons	30	2.80	0.59	
Cheek Flattening	Orthodontist	30	2.90	0.69	0.116
	Laypersons	30	2.60	0.64	
Nose Protrusion	Orthodontist	30	4.00	0.71	0.167
	Laypersons	30	4.05	0.79	
Nose Retruson	Orthodontist	30	4.05	0.48	0.221
	Laypersons	30	4.05	0.46	

Table 1: Scores by the orthodontist and layperson

Parameters	Person	N	Mean	Standard deviation	P
Upper Lip Elongation	Male Orthodontist	15	4.10	0.59	0.003
	Female Orthodontist	15	4.05	0.45	
Lower Lip Elongation	Male Orthodontist	15	4.10	0.48	0.001
	Female Orthodontist	15	4.10	0.45	
Increased Alar Base	Male Orthodontist	15	3.60	0.56	0.00
	Female Orthodontist	15	3.55	0.51	
Decreased Alar Base	Male Orthodontist	15	3.90	0.69	0.202
	Female Orthodontist	15	4.05	0.61	
Chin Prominence	Male Orthodontist	15	3.80	0.55	0.00
	Female Orthodontist	15	3.90	0.54	
Chin Retrusion	Male Orthodontist	15	3.80	0.43	0.010
	Female Orthodontist	15	3.60	0.33	
Cheek Prominence	Male Orthodontist	15	2.90	0.42	0.02
	Female Orthodontist	15	2.90	0.37	
Cheek Flattening	Male Orthodontist	15	1.80	0.53	0.03
	Female Orthodontist	15	1.90	0.49	
Nose Protrusion	Male Orthodontist	15	3.90	0.46	0.11
	Female Orthodontist	15	3.60	0.43	
Nose Retrusion	Male Orthodontist	15	3.60	0.50	0.00
	Female Orthodontist	15	3.40	0.46	

Table 2: Scores of female and male orthodontists

Parameters	Person	N	Mean	Standard deviation	P
Upper Lip Elongation	Male laypersons	15	3.90	0.43	0.003
	Female laypersons	15	3.80	0.39	
Lower Lip Elongation	Male laypersons	15	4.60	0.69	0.431
	Female laypersons	15	4.20	0.54	
Increased Alar Base	Male laypersons	15	4.60	0.61	0.583
	Female laypersons	15	3.90	0.54	
Decreased Alar Base	Male laypersons	15	4.10	0.39	0.332
	Female laypersons	15	3.60	0.49	
Chin Prominence	Male laypersons	15	3.80	0.53	0.249
	Female laypersons	15	4.10	0.66	
Chin Retrusion	Male laypersons	15	3.60	0.39	0.00
	Female laypersons	15	3.80	0.41	
Cheek Prominence	Male laypersons	15	1.80	0.32	0.202
	Female laypersons	15	1.60	0.29	
Cheek Flattening	Male laypersons	15	1.90	0.35	0.090
	Female laypersons	15	1.40	0.33	
Nose Protrusion	Male laypersons	15	4.10	0.54	0.121
	Female laypersons	15	4.05	0.67	
Nose Retrusion	Male laypersons	15	4.05	0.53	0.00
	Female laypersons	15	3.90	0.49	

Table 3: Scores of male and female laypersons



Figure 1: left is normative value right is upper lip elongation

Figure 2: left is normative value right is lower lip elongation



Figure 3: left is normative value right is increased alar base

Figure 4: left is normative value right is decreased alar base



Figure 5: left is normative value right is chin protraction

Figure 6: left is normative value right is chin retraction



Figure 7: left is normative value right is cheek prominence

Figure 8: left is normative value right is cheek flattening



Figure 9: left is normative value right is nose protrusion

Figure 10: left is normative value right is nose retraction

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