SMILE WIDTH PREFERENCE IN VERTICAL FACIAL PROPORTIONS

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Abstract

Objective: *To evaluate the effect of alteration of smile width on attractiveness of smile and to find the most suitable smile width for a particular face type.*

Materials & Methods: *Photographs of two selected subjects were altered to produce three face types for the same individual with the aim of keeping the frame of the smile constant. Smile width was then altered. The pictures were rated by different professionals for attractiveness.*

Results: *The total number of raters was 100 with the mean age of 30.3 years ± 8 years. The alteration in the smile width produced statistically significant difference in the attractiveness of faces whereas the perception difference was found to be insignificant amongst raters of different professions. Broad smile widths were preferred in all subjects except in dolichofacial subjects where a narrow smile was preferred.*

Conclusions: *The variability in smile width showed significant difference in the esthetic score. Preferred smile width was found for individual face types.*

Key Words: *Esthetics, Face types, Smile width.*

Introduction

Facial appearance and its attractiveness are important for personal, professional and social life[1,2]. Orthodontists are involved in treatment which can alter a patient's facial appearance and particularly a patient's 'smile'. Not infrequently orthodontists hear from patients being reluctant to smile due to disapproval of their smile profile which therefore is one of the major reasons for seeking orthodontic treatment. Smile is a dynamic expressive feature which is assessed subjectively by peers, colleagues and family. The subjective attractiveness is difficult to interpret objectively but some objective assessment criteria are suggested to make a smile praiseworthy in everyone's eyes[3-7]. While profile view has its importance, the 'true' perception in the mirror or in social interactions is in the frontal view[8].With the growing numbers of adult patients seeking orthodontic care the hope for treatment towards betterment of esthetics becomes a challenge for the orthodontists.

Smile is a sum of many attributes[9]. Face type can have an influence on the smile perception and the opposite can also be true[7]. In an effort to create good natural esthetics, the orthodontist must give a careful consideration to the patient in his/her entirety. Because teeth do not exist individually and separate from the face to which it belongs, a proportional balance between both should be the aim. The former emphasis on dental and skeletal components is still valid, but greater attention to the soft tissue and facial balance is now a contemporary requirement. Facial type according to Proffit[10], is the proportional relationship of facial height to width more than the absolute value of either of them. In literature, smile analysis has been treated as a separate entity from the face[9]. Achieving a perfect attractive smile for the particular face type is more difficult than simply putting all the teeth perfectly over the jaw bones. Success of treatment has been many meanings for orthodontists but success for patient is the final esthetic outcome[9].

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For this to be accomplished the patients should be evaluated in their entirety.

In our practice, we encounter faces with different proportions. Do the same attractive smile criteria apply to all face types? What may appear unattractive characteristic in one group of people may be quite acceptable in another. So, clinicians should recognize these subtleties and plan accordingly[5]. Studying smile esthetics in different face types is difficult because of inability to standardize the frame of the smile. Smile characteristics which can make a smile more 'attractive' in a particular face type may not be as 'attractive' in another face type. Our aim for an attractive smile width for a particular face type should be tempered with the recognition of the associated risk on the overall facial attractiveness. This study was therefore undertaken to evaluate the effect of alteration of smile width on attractiveness. Furthermore, to find attractive smile width for a particular face type and to determine any difference in perception of esthetics amongst people belonging to different professions.

Materials and Methods

This cross sectional analytical study was done at Rehmat Memorial Post graduate Teaching Hospital after the approval from the ethical review committee. After taking the informed consent, various subjects were selected for posed frontal smiling photographs. One male and one female subject were finally selected on the basis of optimal harmony and symmetry in their face and smile. A new set of different frontal posed smiling pictures were taken of the two selected subjects to capture the best frontal smiling photograph. The photographs were then altered using adobe photoshop version 8.0 (Adobe Systems, San Joe, CA, USA). The pictures were first altered to make three face types for the same subject by altering the face height to width ratios as shown in Figure 1. Smile width was then altered for various facial proportions as shown in Figure 2. Smile width was altered as narrow (22% buccal corridors), medium (15% buccal corridors) and broad smiles (2% buccal corridors). The modified images were imported into Microsoft Power Point (Microsoft, Redmond, WA, USA) as a presentation in a predetermined order for evaluation by 100 judges belonging to different professions including orthodontics, restorative dentistry, arts and fashion and lay persons. The judges were chosen by non-probability cluster sampling. A five point visual analogue scale with an interval of a whole number on a data collection form was used to rate the images, projected for 10 seconds on a projector in a conference room for each group in order to standardize the rating of every picture for each rater.

Results

The total number of raters was 100 amongst them 25 were orthodontists, 25 were restorative dentists, 25 were arts and fashion designers and 25 were lay persons. The mean age of the raters was 30.3 years ± 8 years. Results of ANOVA showed that there was no statistical difference in age amongst all the groups ($p= 0.20$). Result of Chi square showed equal gender distribution in all groups with p-value of 0.23. Table I shows the results of multiple factor ANOVA for altered smile widths. The factor denotes the variability in the parameter chosen whereas the category denotes the raters belonging to different professions in order to note any possible difference in the perception of esthetics. When the category and the factors are taken together, there is statistically insignificant difference in the perception of esthetics for the altered parameters in all the three face types which shows insignificant difference in perception of esthetics amongst the different professionals. However, when only factor is considered, the alterations in smile parameters result in statistically significant difference in the perceived attractiveness of the face. Table II shows the mean scores for various smile width preferences. For mesofacial and brachyfacial male and female subjects a broad smile was preferred. For dolichofacial subjects however a narrow smile width was preferred for both genders.

Discussion

Knowledge of the preferred smile widths for variant face types is crucial in today's era where attractiveness plays an important part in every walk of life. From the ancient times of more flattened to the modern fuller concept, variations amongst people's subjective assessment has always been recognized. Defining an attractive smile is a difficult task. The contribution of various raters from different professions in search for the ultimate attractive smile width for a particular face type was the rationale of the current study. The discrepancy of perception between different professionals can add to the perplexities

Table 1: Result of repeated measure ANOVA for smile width

VARIABLE		GENDER	FACE TYPE		
			DOLICOFACIAL p-value	MESOFACIAL p-value	BRACHYFACIAL p-value
Smile width	FACTOR	MALE	0.02*	0.04*	0.03*
		FEMALE	0.001***	0.02*	0.05*
	FACTOR & CATEGORY	MALE	0.4	0.8	0.2
		FEMALE	0.4	0.45	0.10

* P=.05; ** P=.01; *** P=.001

Table 2: Mean scores for smile width preferences in the three face types

Smile width	CATEGORY	Dolicofacial Male		Mesofacial Male		Brachyfacial Male		Dolicofacial Female		Mesofacial Female		Brachyfacial Female	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
broad smile	orthodontist	2.92	1.0	2.83	0.9	3.42	1.1	1.92	1.2	3.33	0.8	3.25	0.9
	restorative dentist	3.46	0.8	2.62	1.2	3.15	1.2	2.31	1.0	2.85	0.9	3.31	1.4
	arts and fashion	2.71	1.3	2.93	0.8	3.00	1.1	2.21	0.9	3.71	1.2	3.43	1.2
	lay person	3.36	1.0	3.80	1.2	3.82	0.9	2.64	1.3	3.36	0.9	4.18	1.3
	Total	3.10	1.1	3.20	1.0	3.32	1.1	2.26	1.1	3.32	1.0	3.52	1.2
narrow smile	orthodontist	2.67	1.2	2.92	0.8	3.25	0.8	2.42	0.9	2.83	0.9	2.33	1.3
	restorative dentist	3.08	1.1	2.38	1.0	3.00	1.0	2.54	1.1	2.85	0.9	3.00	1.6
	arts and fashion	2.93	1.1	3.21	1.1	2.90	1.1	2.64	0.9	2.93	0.9	3.29	1.3
	lay person	4.00	0.9	3.55	1.0	3.80	0.6	3.55	0.8	3.27	1.3	3.73	1.3
	Total	3.14	1.2	3.00	1.0	3.20	0.9	2.76	0.9	2.96	1.1	3.08	1.3
medium smile	orthodontist	2.50	1.0	2.75	1.0	3.00	1.0	2.08	1.0	3.58	0.8	3.17	0.8
	restorative dentist	3.23	1.1	2.77	1.2	3.23	1.3	2.69	1.5	2.54	1.0	3.08	1.3
	arts and fashion	2.57	1.5	3.07	1.0	3.21	1.0	2.43	0.8	3.36	1.0	3.50	1.0
	lay person	3.45	0.9	2.91	1.1	3.80	1.0	2.55	1.0	3.18	1.3	3.82	1.1
	Total	2.92	1.2	2.88	1.1	3.30	1.1	2.44	1.1	3.16	1.0	3.38	1.1

in the definition of an attractive smile[6]. These uncertainties can lead to confusions for orthodontists. Also true is the fact that an orthodontist has a great influence on the treatment planning for the patient. The decision for the 'end of treatment smile' should strongly incorporate the patient's self-perception of the different options that the orthodontist can give during the treatment planning phase. The digital 3D images are especially useful in this regard. Previous literature[3,4,6,8,11-17] shows evaluation of smile parameters separate from the facial features. The purpose of this investigation was to broaden the understanding of the impact of specific face types on the overall smile esthetics and to establishcontemporary concepts of smile width preferences according to the face type. The techniques of alteration of the same face into three face types freed the raters from the concern of other confounding and decisive features of the face. The ratings have enabled the formulation of some guidelines in designing an attractive smile

Fig: 1 Different face types for the female and male subjects

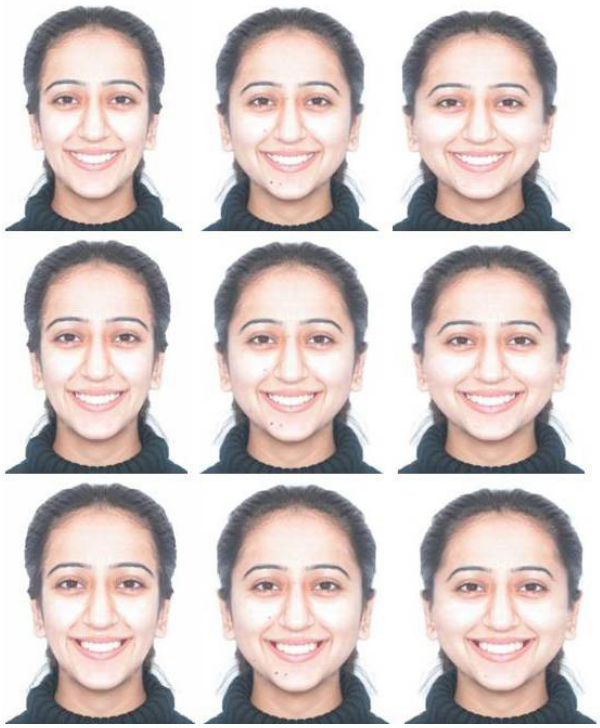

Fig: 2 Smile width variations for female subject in the three face types

for a particular face type.

According to Schabel et al[11], no correlation was found between cases passing the ABO objective grading system which is the orthodontist's success criteria and the esthetics of the smile. Harmony of teeth to both intra andextra oral soft tissues makes a smile more attractive. This actually implies that even if the teeth are perfectly set on their respective bases, ideal esthetics in harmony with the face can still be in doubt. Our study results showed that variations in a particular smile parameter have statistically significant difference on the perceived attractiveness in all the three face types as shown in table 1. At the same time, the results of multiple factor ANOVA showed that the subjective assessment of attractiveness did not vary significantly amongst people of different professions. This is in agreement with some studies like that of Ritter et al[18], who compared the esthetic influence of orthodontists and lay persons on smile widths during smiling. Krishnan et al[6] analyzed the perception difference between dental specialists and lay persons and found no perception difference between specialists and lay persons on the smile evaluation. Erum and Fida[12] in their results concluded that orthodontists, dentists, lay persons and art students share similar esthetic perception.

For brachyfacial and mesofacial male and female subjects, broad smiles were preferred. For dolichofacial subjects however a narrow smile width was preferred. The general trend in scoring reveals preference for broad smiles for both the genders. This should specially be aimed for brachyfacial subjects and more specifically for the female subjects. The scores for the lay persons however show more preference for narrow smiles which therefore can be acceptable during treatment where there are some alveolar limitations. Orthodontists howevershowed consistent preference for broad smiles. Moore[3] reported that smile width variations are less significant in determining smile attractiveness as perceived by lay persons. Yang[13], Gianelly[19] and Martin[20] have concluded that narrow smiles with increased buccal corridors are undesirable. Moore et al[3] suggested the presence of buccal corridors to be considered as one of the problems to be corrected during orthodontic treatment. Similar results were reported by other authors[21,22].

The end of treatment smile objective should be tailored to the attractiveness need and perception of the patient. Not all faces are alike and so not all face are to be treated alike. Some of the variables are acceptable in a rangerather than a point therefore the patient's view and preferences should be the major decisive factor in planning the end smile esthetics. The esthetic outcomes can be controlled by timely planning especially before the treatment starts.

Conclusion

The variability in smile width showed significant difference in the esthetic score however statistically insignificant differences were found in the perception

between raters of different professions.

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