Original Article

Smile Predilections of Dental Specialists, Art Students and Lay Persons for Varying Lip Thicknesses

Nabila Anwar, Rizwan Shah and Faisal Pasha

ABSTRACT

Objective: To identify ideal smile preferences of different professionals for varying lip thicknesses and to evaluate any perception differences between different professionals.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Rehmat Memorial Post-graduate Teaching Hospital (Women Medical and Dental College Abbottabad) from May 2016 to February 2017.

Material and methods: One male and one female subject was selected with fairly ideal facial features and smile proportions. Three alternate lip thicknesses were generated by the use of photographs taken for the selected individuals. Smile parameters were also altered to produce different combinations of lip thicknesses and smile parameters (lip line, smile width and smile arc). These pictures were then 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 altered smile parameters produced statistically significant difference in the esthetic scores of raters. For thick lip subjects, preferred smile was a medium width flat smile which is characterized by a lip line with increased upper and lower incisor show. For medium lip thickness, preferred smile was a consonant broad smile with a lip line that showed the upper incisors only.

Conclusion: Smile predilections of dental specialists, arts students and lay persons were found for varying lip thicknesses.

Key Words: Lip thickness, Lip line, Smile width, Smile arc

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INTRODUCTION

The criteria for attractiveness is difficult to set as it is a matter of self perception which can vary according to the individual's owns preferences and concerns but a few objective assessment criteria has been suggested in order to make the appearances more commendable.[1-9] Objective standardization of an attractive smile implies a smile which possesses some properties that makes a smile distinctly praiseworthy in everyone's eyes. Many patients in our clinical practice come with the objective of esthetic rehabilitation of their smile due to personal dissatisfaction of their smile esthetics. During evaluation of smile esthetics, the teeth are shown in the curtain of upper and lower lips.[2-4,6]

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Literature shows that smile appealness has been studied as a distinct variable from other facial features.[2-10] There are individual orthodontist's preferences which can enhance or destroy the patient's demands for an ideal smile.[1,6] The ideals and standards of beauty change with time, therefore for the orthodontist it is crucial to know the recent preferred smile esthetic features. The array of different lip thicknesses in patients usually complicates the subjective assessment of smile esthetics and the changing preferences further puzzle the orthodontist in planning the end of treatment smile.[1] Orthodontists are hence obliged to comprehend the harmony and equilibrium along with the definition of beauty that the patient perceives and seeks. Schabel et al. in his study concluded that there was no association amongst cases passing the set criteria of ABO objective grading system which is the orthodontist's success standard of smile esthetics.[11] A balance of the soft tissues and the teeth makes a smile more pleasing. 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.[11]

An orthodontist should aim to achieve a beautiful smile for a particular lip thickness with the acknowledgement of the accompanying risks on the general facial appeal. The researchers of this study thought that ideal smile

parameters might be different for patients with different lip thicknesses. Therefore, this study was conducted to identify ideal smile parameters for varying lip thicknesses and to evaluate any perception differences for esthetics of smile between individuals belonging to various professions.

MATERIALS AND METHODS

This study was of cross-sectional design and was performed at Rehmat Memorial Post-graduate Teaching Hospital after approval from the ethical review committee of the hospital. Informed consent was sought from all the individuals involved in the study. Several subjects were carefully chosen in order to obtain the ideal posed frontal smiling photographs. Out of the acquired data, one photograph for each male and female was finalized on the basis of symmetric smile and harmonious face. The pictures were altered to make three lip thicknesses for the same subject by altering the vermillion show of the subject using adobe photoshop version 8.0 (Adobe Systems, San Joe, CA, USA).

Furthermore, various smile parameters were also altered including lip line, smile width and smile arc as shown in Fig 1-3. Figure 1 shows the alteration of smile arc as consonant, flat and reverse types. Smile width was altered as narrow (22% buccal corridors), medium (15% buccal corridors) and broad smiles (2% buccal corridors) as shown in Figure 2. Lip line was modified as: both dentitions visible, upper incisors visible, upper incisors and 2mm gum and 4mm gum visible as shown in Figure 3. The altered images were transferred to Microsoft Power Point (Microsoft, Redmond, WA, USA) and were presented in a prearranged order to individuals belonging to various professions including restorative dentistry, orthodontics, arts students and lay persons for evaluation. The images were rated on a five point visual analogue scale designed to indicate the most preferred to least preferred image. The images were projected for 10 seconds in order to standardize the rating of every picture.

RESULTS

The required sample size was calculated to be 100. The raters were then equally divided in to 4 categories having 25 persons in each including restorative dentists, orthodontists, arts students and 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. Multiple factor ANOVA results of are shown in Table I. When the factors and the category are considered along with each other, there is statistically insignificant difference in the perception of esthetics for the altered parameters in all the three lip thicknesses. These results are for all the altered parameters including lip line, smile width and smile arc. However, when only factor is considered, the alterations in smile attributes result in statistically significant difference in the perceived attractiveness of the smile.

Table II shows the total score for the altered smile parameters in the three lip types. For thick lips male and female subjects, the highest mean score was for a lip line showing the upper and lower incisors. For the medium lip male and female subjects the preferred lip line was the one showing the upper incisors only.

Figure No.1: Altered smile arc in the three lip thicknesses

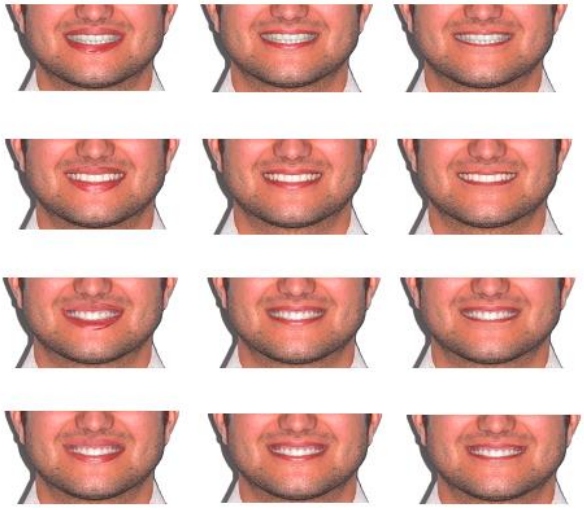

Figure No.2: Altered lip line in the three lip thickness subjects

Figure No.3: Altered smile width in the three lip thickness subjects

Whereas for the thin lip subjects, a 2mm gum show for male and 2-4 mm gum show for female were preferred. Result for smile width preferences showed the following results: medium smile width for thick and thin lips and broad smile was preferred for medium lip thickness in both genders. Consonant smile was preferred in thin lips whereas flat smile arc was preferred in thick lips. In medium lip thickness however, flat smile arc was preferred for male and consonant smile arc was preferred for female subject.

Table 2 shows the total score for the altered smile parameters in the three lip types. For thick lips male and female subjects, the highest mean score was for a lip line showing the upper and lower incisors. For the medium lip male and female subjects the preferred lip line was the one showing the upper incisors only.

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Table No.I: Result of Repeated Measure ANOVA

Variable		Gender	Lip Thickness		
			Thick Lip - p-value	Medium Lip - p-value	Thin Lip - p-value
Lip line	Factor	Male	0.001	0.01	0.04
		Female	0.03	0.001	0.001
	Factor & category	Male	0.35	0.23	0.19
		Female	0.62	0.42	0.25
Smile width	Factor	Male	0.02	0.03	0.03
		Female	0.001	0.001	0.05
	Factor & category	Male	0.4	0.8	0.2
		Female	0.4	0.45	0.10
Smile Consonance	Factor	Male	0.03	0.04	0.03
		Female	0.04	0.01	0.01
	Factor & category	Male	0.1	0.69	0.3
		Female	0.9	0.6	0.2

Table No.2: Mean Scores for Lip Line Preferences in the Three Lip Types

Parameter	Alteration of Parameter	Male Subject			Female Subject		
		thick lips	medium lips	thin lips	thick lips	medium lips	thin lips
Lip line	upper incisor	3.02±0.8	3.38±0.9	2.64±1.2	2.84±0.6	3.52±0.9	2.22±0.2
	upper and lower incisor	3.42±0.7	3.14±1.3	2.48±1.0	3.24±0.8	3.26±0.9	2.20±0.4
	2mm gum	3.1±0.2	3.16±0.4	2.98±0.2	2.18±0.6	2.82±1.0	2.76±0.9
	4mm gum	2.32±0.4	2.94±0.3	2.28±0.5	2.18±1.0	3.16±1.0	2.71±0.4
Smile width	Narrow	2.72±0.3	3.08±0.2	2.24±0.1	2.54±1.0	2.82±0.9	2.02±0.6
	Medium	3.42±0.6	3.14±0.3	2.98±0.7	3.34±0.7	3.26±0.9	2.80±1.0
	Broad	3.1±0.8	3.36±0.8	2.58±0.3	3.18±0.7	3.42±1.0	2.73±0.7
Smile arc	Flat	3.32±0.9	3.34±0.8	2.28±0.6	2.98±0.8	3.26±0.7	2.40±0.9
	Consonant	3.02±0.3	3.18±0.7	2.84±0.8	2.54±1.0	3.42±0.9	2.72±1.0
	Reverse	2.82±0.5	2.84±0.3	2.18±0.4	2.34±0.6	2.6±0.9	2.20±1.0

DISCUSSION

Orthodontists have experienced a paradigm shift from an emphasis on correction of tooth alignment to enhancement of smile esthetics especially in adult orthodontic patient. The ability of an orthodontist to recognize the positive factors for enhancement of smile esthetics is a contemporary requisite.[8] The discrepancy of perception between the individuals belonging from different professions can cause confusions in the ultimate description of ideal smile parameters. The uncertainties can also lead to difficulty for an orthodontist in choosing the 'end of treatment smile' for the patient. The digital 3D images can be useful in this regard.[12,13] Smile attractiveness and the thickness of lips are related parameters. An attractive smile would depend on the best possible harmony of the smile features with the thickness of lips which makes the lip curtain. This study was therefore aimed at outlining the denominators of attractive smiles for particular lip thickness.

The basic ideology of altering of the same male and female photograph was to avoid the confounding factors of the face that would otherwise deviate the raters from making an honest opinion about the images. Our study results showed that variations in a particular smile parameter have statistically significant difference on the perceived attractiveness in subjects with all the three lip thicknesses. At the same time the results of multiple factor ANOVA showed that the individual

assessment of attractiveness did not vary significantly amongst people belonging to various occupations. This agrees with some studies like that of Ritters et al.[14], who evaluated the effect of smile width during smile as perceived by lay persons and orthodontists. Krishnan et al.[7], found no difference of perception between lay persons and dental specialists for smile evaluation. Erum and Fida[15], in their study concluded that different professional personnel among which art students, orthodontists, dentists and lay persons were considered, had comparable esthetic perception. Our study results show least scores for thin lips which therefore prove higher preference for thick lips especially in females.

Alterations of smile parameters including lip line, smile width and smile arc were done separately in both male and female subjects with different lip thicknesses while keeping the other facial features constant to control the confounding factors that would be otherwise introduced by other facial features. Our study results showed preference of different lip lines for varying lip thicknesses. For thick lips, a lip line showing both the dentitions was favored. For medium lip thickness no gums show whereas for thin lips a greater gum show was chosen as the preferred lip line. The preference of lip line for different lip thicknesses in the same smile frame is the first study on the topic and therefore our results cannot be compared with the results of previously done studies on smile esthetics. Flores Mir et al.[16], concluded that mild gingival display is harmonious with an attractive smile according to lay persons. Geron[5] concluded a 1mm gingival exposure as within the esthetic range. In contrast, Erum and Fida[15] concluded that the preferred lip line was the one with no gum show. However, the subjects chosen for smile assessment in the above mentioned studies were only of average lip thickness. More gum show was preferred in our female subjects. Even a 4 mm gum show was acceptable for our thin lip female subject which might be due to relatively more youthful lip line requirement for thin lips as thin lips are feature of aging especially for female subjects.

The general trend in scoring reveals preference for broad smiles in both the genders. Our results showed preference of medium smile width for thick and thin lip male and female subjects whereas broad smile preference for medium lip thickness. Husley et al.[4] reported that smile width variations are less significant in determining smile attractiveness as perceived by lay persons. Gianelly[17] and Sarver[18], however have concluded that narrow smiles with increased buccal corridors are undesirable. Moore et al.[19] suggested the presence of buccal corridors to be considered as one of the problems to be corrected during orthodontic treatment. Our study results showed preference for consonant smiles for both genders in thin lips. This is very trivial as Sarver[18], has pointed out that smile arc flattening can occur during orthodontic treatment. Parekh et al.[20] also concluded that both orthodontists and lay persons perceived flat smile arc unattractive. Krishnan et al.[7] therefore suggested that orthodontists should not disturb consonant smiles but rather create them with proper bracket positioning. Our study results however revealed preference for flat smile arcs in the thick lip subjects. This is contradictory to the results of the above mentioned studies.[7,18,20] In author's humble opinion, a flat smile arc may add a pleasant affect to the person having thick lips rather than a consonant smile arc. In medium lip thickness however, flat smile was preferred in male and consonant for female. This might be because of more feminist smile feature requirements in female subject. Reverse lip line was not favored in any subject.[21]

Smile esthetics are affected with varying lip thicknesses. A particular smile characteristic may not score equal in variant lip thickness. The 'end of treatment smile' objective should be tailored to the attractiveness need according to the facial features in order to enhance attractiveness by harmonizing all the facial features. The esthetic outcomes can be controlled by timely planning especially before the treatment starts which ultimately depends on the knowledge and skills of an orthodontist.

CONCLUSION

The variability in smile parameters in subjects with different lip thicknesses showed significant difference in the esthetic scores of the raters of different professions while the perception difference among the raters was insignificant. For thick lip subjects, preferred smile was a flat smile characterized by a lip line showing the upper and lower incisors and having a medium width for both genders. For medium lip thickness subjects, preferred smile was characterized by the lip line showing only the upper incisors, a broad smile width with smile consonance preference especially for the female subject. For thin lip thickness subjects, preferred smile was characterized by a consonant smile arc having a medium smile width with a lip line showing 2mm gum show for male and more gum show for the female subject.

Recommendations: Variations in judgments are common hence the patient should be convinced to participate in planning the final esthetic outcome which are most compatible with the other facial features.

Author's Contribution:

Concept & Design of Study:	Nabila Anwar
Drafting:	Rizwan Shah
Data Analysis:	Faisal Pasha
Revisiting Critically:	Nabila Anwar, Rizwan Shah
Final Approval of version:	Nabila Anwar

Conflict of Interest: The study has no conflict of interest to declare by any author.

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