Some esthetic factors in a smile

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Esthetics have become increasingly important in the practice of modern restorative dentistry and are synonymous with a natural, harmonious appearance. An attractive or pleasing smile clearly enhances the acceptance of an individual in our society by improving the initial impression in interpersonal relationships. A defective smile might be considered properly as a physical handicap. The smile is one of the most important facial expressions and is essential in expressing friendliness, agreement, and appreciation.

Often the demand for esthetics motivates the patient to seek dental treatment. However, beauty is not absolute and is extremely subjective. It is dictated often by cultural or ethnic factors and individual preferences.

It would be useful to describe some average desirable characteristic features of smiles to help achieve optimum results in esthetic oral rehabilitation. This study formulates a standard of normalcy in an esthetic smile relative to

1. smile type (high, average, low);
2. parallelism of the maxillary incisal curve with the lower lip;
3. position of the incisal curve relative to touching the lower lip; and
4. the number of teeth displayed in a smile.

The standard may serve as a guideline for restoration or enhancement of esthetics for the anterior component of the dentition.

MATERIAL AND METHODS

A comparative analysis of the characteristic dental and facial features of esthetic smiles was conducted with 454 full-face photographs of dental and dental hygiene students with open smiles (smiles displaying teeth). The subjects were 207 men and 247 women from 20 to 30 years of age. Each subject was compared, analyzed, and evaluated by careful visual judgment rather than by mathematical measurements. However, to minimize possible evaluator preferences that can occur in this type of survey, we analyzed the data independently. Differences between smile type and parallelism of the maxillary incisal curve relative to touching the lower lip were determined statistically with z scores.

Definition of terms

Open smiles were divided into three categories (Fig. 1).

High smile (S1). Reveals the total cervicoincisal length of the maxillary anterior teeth and a contiguous band of gingiva (Fig. 1, center and Fig. 2, A).

Average smile (S2). Reveals 75% to 100% of the maxillary anterior teeth and the interproximal gingiva only (Fig. 1, bottom and Fig. 2, B).

Low smile (S3). Displays less than 75% of the anterior teeth (Fig. 1, top and Fig. 2, C).

RESULTS

Smile type. The survey revealed that 48 (10.57%) persons were classified as having a high smile (S1), 313 (68.94%) as having an average smile (S2), and 93 (20.48%) as having a low smile (S3) (Table I and Fig. 3).

The differences in smile type between men and women were significant statistically: (p < .05) (z[S1] = 2.33; z[S2] = 2.75; z[S3] = 4.50; critical region z = 1.96).

Parallelism of the maxillary incisal curve with the lower lip. Three hundred eighty-five (84.8%) subjects showed parallelism of the upper incisal curve with the inner curvature of the lower lip, 63 (13.88%) showed a straight rather than a curved line, and six (1.32%) showed a reverse smile line (Fig. 4 and Table II). The differences between men and women were insignificant statistically.

Position of the incisal curve relative to touching the lower lip. Three groups were identified: (1) the incisal curve of the maxillary anterior teeth touched the lower lip (C1) (Fig. 5, A), (2) the incisal curve of the maxillary anterior teeth did not touch the lower lip (C2) (Fig. 5, B), and (3) the incisal portions of the
maxillary anterior teeth were slightly covered by the lower lip (C3) (Fig. 5, C).

The data revealed that 192 (46.61%) subjects showed the maxillary anterior teeth touching the lower lip, 134 (34.62%) were not touching the lower lip, and 61 (15.76%) had the incisal portions of the anterior teeth covered by the lower lip. The differences between men and women in groups C1 and C2 were significant statistically: $p < .05$ ($z[Cl] = 3.65; z[C2] = 3.0; z[C3] = 0.75$; critical region $z = 1.96$) (Table III). Differences between men and women in group C3 were not significant statistically.

The number of teeth displayed in a smile. The number of teeth displayed in a smile were as follows: six anteriors only, 7.01%; six anteriors and first premolars, 48.6%; six anteriors and first and second premolars, 40.65%; six anteriors, first and second premolars, and first molars, 3.74%.

The results of this experiment show that a typical or average smile has the following characteristics:

1. The overall cervicoisinusal length of the maxillary anterior teeth are displayed.
2. Gingiva does not show (except the interproximal gingiva).
3. The incisal curvature of the maxillary anterior teeth parallels the inner curvature of the lower lip.
4. The incisal curvature may be either totally touching or slightly touching the lower lip.
5. The six maxillary anterior teeth and the first or second premolars are displayed.
6. The midline coincides with a harmonious balance of the smile.
7. Stereotyped “feminine” and “masculine” tooth anatomy characteristics could not be related to the sample.

DISCUSSION

Consideration of the criteria of a smile obtained from this study may be very useful in improving the esthetic value of restorations; for example, establishing the length of the maxillary teeth and the interincisal distances between the anterior teeth.

A correct interincisal distance among the centrals, laterals, and canines is necessary to create an attractive incisal curvature that parallels the inner curvature of the lower lip, and it also creates the esthetically required “dynamic negative space.”

In an open smile the upper and the lower teeth usually maintain a slight interocclusal clearance. This space might be equal to the interocclusal space of vertical dimension of rest.

Artists use the “eye unit” (the unit of facial measurement) theory to describe the topographic interrelation-
Fig. 2. Photographs illustrating smile types. A, High smile ($S_1$). B, Average smile ($S_2$). C, Low smile ($S_3$).

Fig. 3. Comparison between smile types of men and women. $S_1$ = High smile; $S_2$ = average smile; $S_3$ = low smile.

Absolutely symmetrical or centered. Patients tend to relate their midline to the upper lip rather than to other facial features that are further from the mouth. An imaginary line dividing the midline lobe of philtrum into equal or symmetrical halves may be used to establish the midline (Fig. 7, A and B).

Midline diastema seems to divide the dental composition into two separate entities that disturb the cohe-

Fig. 4. Types of maxillary anterior incisal curvature in relationship to lower lip; that is, parallel, reverse, or straight.
ESTHETIC FACTORS IN A SMILE

Fig. 5. Maxillary anterior incisal edges: A, touching (C1). B, not touching (C2). C, Slightly covered by lower lip (C3).

Table I. Comparison between smile types of men and women

<table>
<thead>
<tr>
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<th>High smile (S1)</th>
<th>Average smile (S2)</th>
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p < .05; critical region: z = 1.96. S1 = 2.33; S2 = 2.75; S3 = 4.50.

Table II. Types of incisal curvature

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p < .05; critical region: z = 1.96 (N.S.).

Table III. The position of maxillary anterior incisal curvature relative to lower lip

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<th>Touching (C1)</th>
<th>Not touching (C2)</th>
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p < .05; critical region: z = 1.96. C1 = 3.65; C2 = 3.0; C3 = 0.75 (N.S.).
SUMMARY AND CONCLUSIONS

A survey of the characteristics of an open smile was conducted with 454 full-face photographs of randomly selected dental and dental hygiene students.

Findings show that an average smile exhibits approximately the full length of the maxillary anterior teeth, has the incisal curve of the teeth parallel to the inner curvature of the lower lip, has the incisal curve of the maxillary anterior teeth touching slightly or missing slightly the lower lip, and displays the six upper anterior teeth and premolars. Consideration of the characteristics may be useful in improving the esthetics of restorations.

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REFERENCES


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