



Smile Esthetics – A Literature Review

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Abstract: Smile is the most indicative of facial attractiveness than soft tissue influences. For this reason, it's crucial to consider the smile's characteristics and the dynamic as well as static relationships between the teeth and the soft tissues of the face. Evaluating dental and facial aesthetics is a crucial component of the clinical evaluation because one of the main goals of orthodontic treatment is to overcome psychosocial challenges linked to facial and dental appearance and improve social well-being and QOL in the process. Cultural and ethnic characteristics considerably influence how attractive a face is regarded, yet regardless of culture, a severely disproportionate face becomes a psychosocial issue. Thus, it is helpful to reframe the objective of this section of the clinical evaluation as an assessment of face proportions rather than aesthetics. Therefore the article will be a reviewed on

components of macro, mini and micro esthetics in orthodontics.

Keywords: Macro esthetics, Mini esthetics, Micro esthetics.

Introduction:

The philosopher Alexander Gottlieb Baumgarten first used the term "aesthetics" in 1735 to refer to "the science of how things are known through the senses," which is taken from the Greek word "aisthetike." The main goal of orthodontic therapy is to improve social well-being and quality of life while overcoming psychological challenges related to facial and dental appearance¹. Therefore, restoring a natural, healthy, and attractive appearance is the main objective of orthodontic therapy. Although perfect occlusion remained the fundamental functional objective, it was known that patient happiness depended greatly on the aesthetic result^{2,3}. This has caused the aesthetic paradigm in orthodontic treatment to emerge.

The voluntary smile and the spontaneous smile are the stages of smile formation⁴. Accordingly, assessing oral and facial aesthetics and understanding the smile is crucial to the clinical assessment. Photographs of smiles are taken for evaluation purposes. Digital videography allows for the live capture of speech and smiles. The doctor can record anterior tooth show during speech and smiling at the equivalent of 30 frames per second thanks to digital video and computer technology. The videos are taken in a consistent manner with the camera positioned at a predetermined distance from the subject. Two video segments are captured: one in frontal dimension and the other from an oblique angle.^{5,6,7,8}

The following are the steps should be taken to conduct a thorough inspection of the facial and dental features:

- a) Facial proportions in all three planes of space (macro-esthetics).
- b) The dentition in relation to the face (mini-esthetics).
- c) The teeth in relation to one another (micro-esthetics).

Classification of smile esthetics:

Smile esthetics can broadly be classified into

- Macroesthetics
- Miniesthetics
- Microesthetics

1. The facial features in the three spatial planes (macro-esthetics): In that initial step, issues like asymmetry, excessive or inadequate face height, mandibular deficiency or excess, etc. would be highlighted as examples of issues.

2. The smile framework (mini-esthetics): The smile framework, which is enclosed by the upper and lower lips during smile animation, evaluates factors including excessive buccal corridors, insufficient anterior tooth display, improper gingival heights, and inadequate gingival display when a person smiles.

3. The teeth (micro-esthetics): This includes evaluating the height and width of the teeth, the shape and contour of the gingiva, connections, black triangles, and tooth colour.

Macroesthetics:

A. Facial proportion

1) Vertical division

The face is ideally divided into equal thirds:

- Upper: Trichion to Glabella
- Middle: Glabella to Subnasion
- Lower: Subnasion to Gonion

The lower third of the face is further divided into two unequal parts:

- a. Subnasion to commissures of the lips is equal to one-third or 18 to 20 mm from the subnasion to the upper lip.
- b. Commissures of the lips to the gonion is equal to two-thirds or 36 to 40 mm from the lower lip to the gonion⁹. (Figure 1)



Figure 1: Vertical Proportions

2) Horizontal division

A perfect proportionate can be divided into equal fifths in the central, middle and lateral. The central and medial fifths are determined by the distance between the eyes and their recommended equivalence in breadth. The nose should be the same width as or slightly wider than the chin, and both should be centred within the middle fifth⁹. (Figure 2)

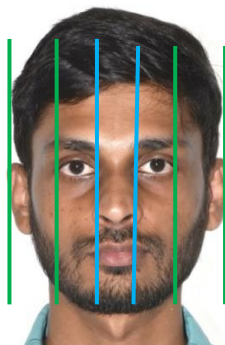


Figure 2: Horizontal Proportions

B. Balance and Symmetry

The facial midline establishes facial symmetry. The midline separates the right and left sides of the face by passing through the middle of the face and the cupid's bow on the lip. The closer the sides are to bilateral replication or mirror images, the more symmetric and identical they are, and the more naturally harmonious and attractive the face is (horizontal symmetry)⁹. (Figure 3)

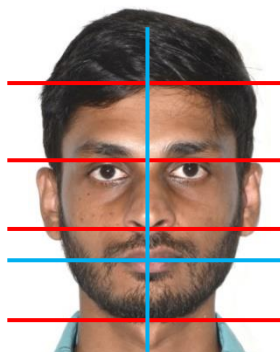


Figure 3: Facial Balance and Symmetry

C. Facial profile:

With the head in its normal position, two lines are drawn: one extending from the most prominent point on the forehead to the subnasion, and the other from the subnasion to the pogonion. It should be almost a straight line formed by these line segments. The profile concavity (upper jaw behind chin) or profile convexity (angle between them) is indicated by the position of the upper jaw. Consequently, a concave shape implies a skeletal Class III jaw relationship, while a convex profile shows a skeletal Class II jaw relationship⁹. (Figure 4)



Figure 4: a) Convex profile b) Straight profile c) Concave profile

Miniesthetics:

Examining the relationship between each arch's dental midline and that jaw's skeletal midline, as well as the vertical relationships between teeth and lips both

at rest and when smiling, as well as transverse relationships like the occlusal cant are crucial elements of miniesthetics.

A. Amount of Incisor and Gingival Display:

Profitt⁹ contends that a social smile with a gingival show of 2mm is normal. Additionally, it's essential to keep in mind that as age progresses, there will be less incisor exposure, changing the vertical relationship between the lip and the teeth. This makes identifying the vertical tooth-lip correlations during the diagnostic evaluation and keeping them in mind during treatment even more significant.

B. Transverse Dimensions of the Smile Relative to the upper arch:

The distance between the maxillary posterior teeth, particularly the premolars, and the inside of the cheek determines how much buccal corridor is visible when smiling. Orthodontists are aware that broadening the maxillary arch can improve the appearance of the smile if cheek draping is noticeably larger than the dental arch. Prosthodontists contend that excessively wide buccal corridors (also known as "negative space") are unattractive¹⁰.

C. The Smile Arc:

The contour of the incisal margins and cupal tips of canine of the maxillary anterior teeth in relation to the curvature of the lower lip during a social smile is known as the smile arc. The lower lip's curvature should be parallel to the incisal borders of these teeth for optimal aesthetics. They are referred to as consonant if the lip and dental contours coincide. A Non-consonant smile arc is less attractive and seen when there is a flattening of the teeth arc¹¹. (Figure 5)



Figure 5: a) Consonant smile arc b) Non – Consonant smile arc

Microesthetics:

A. Width and height of crowns:

The central incisor's width ranges from 8.73 to 9.3 mm while its height ranges from 10.4 to 11.2 mm. In general, females have slightly wider teeth than males do, with canines 81% and 85%, lateral incisors 79% and 85%, and central incisors 86% and 85%, respectively. According to the most recent research, there is no statistically significant difference between men and women in the percentage between the height and width of upper anterior teeth, which ranges from 75% to 80% for central incisors,

from 66% to 70% for lateral incisors, and from 80% to 85% for canines¹¹. (Figure 6)



Figure 6: Width and height of crowns

B. Golden proportion:

The golden ratio is represented by the lateral incisor's width being 62% of the central incisor's actual width, the canine's width being 62% of the lateral incisor's apparent width, and the first premolar's apparent width being 62% of the canine's actual width¹¹. (Figure 7)

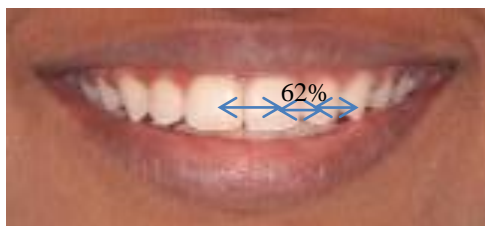


Figure 7: Golden Proportion

C. Height of contact points:

The height of the central incisors' crowns must be 50% at their contact point with each other. This height will then gradually decrease distally, becoming 40% at the contact point between the central and lateral incisors and 30% at the contact point between the lateral incisor and canine¹¹.

D. Zenith:

The highest point of the gingival contour curvature is known as the gingival zenith, and it can vary greatly in anterior teeth. The highest point of the gingival contour of the lateral incisor should ideally be in the center of the crowns, along the long axis of the tooth, whereas it is distally displaced on the central incisor and canine¹¹.

E. Height of the papilla / black spaces:

The interdental papilla is present in 98% of cases where the cervical limit of the interdental contact is placed up to 5 mm from the alveolar bone crest. Nearly 50% of the time, there will be a dark space between the contact point and the bone crest when the distance is 6 mm, and only 27% of the time, the interdental papilla will fill that space when the distance is 7 mm¹¹.

F. Gingival contour:

The specifications for obtaining gingival contour were defined by Kokich, Nappen, and Shapiro¹², who set the gingival margins of the maxillary canines and central

incisors at the same level and the incisal edge of the lateral incisors 1 mm below those. (Figure 8)



Figure 8: Gingival contour

G. Tooth shade and tooth colour:

With advancing age, the teeth's colour and shade alter. At a younger age, the teeth appear lighter and brighter; as people age, they get darker and duller. This is due to the production of secondary dentin when pulp chambers shrink and face enamel thins, which reduces its translucency and increases the contribution of the tooth's darker underlying dentin to the shade¹³.

Conclusion:

Although not new, the principles of smile aesthetics are much too frequently overlooked in the planning of orthodontic treatment. The ideal components of the smile should be viewed as artistic recommendations rather than as strict limitations to help orthodontists treat specific patients who are more conscious than ever of the aesthetics of their smiles. Even though there are numerous factors to take into account when preparing an aesthetic case, there are numerous rules and guidelines that can help guide therapy. Prior to attempting cosmetic dentistry, it is crucial to have a solid understanding of the fundamental ethical principles as well as the components of macro, mini, and micro-aesthetics. The orthodontist should be able to fully live by the principles of cosmetic dentistry with the aid of a solid understanding of orthodontic mechanics and growth changes¹⁴.

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