

# Evaluation of aesthetic perception of the smile by lay people and dental undergraduate students

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**Objective:** Assess the aesthetic perception of dental undergraduate students and lay people. **Methods:** The sample consisted of 50 lay people and 50 undergraduate students. Data were collected by means of forms with questions and images, then they were tabulated and subjected to descriptive statistics. **Results:** For lay people, teeth alignment, color and shape were the major complaints. Regarding deviation, 28 (56%) considered as ideal a

smile without midline deviation. A smile with coincident curvature was considered the most aesthetic for 43 (86%) respondents. Smile with no diastema was preferred by 47 (94%) lay people. As for the undergraduate students, teeth alignment, color and shape were the major complaints. A total of 34 (68%) considered a smile without midline deviation to be the most pleasant. The ideal smile line was that with coincident curvature (90%). The presence

of diastema was not considered as aesthetic by any of the undergraduate students. **Conclusions:** The kind of smile influences personal relationships both for lay people and undergraduate students. For the latter, it is of greater importance. The most attractive smiles for both groups were those without midline deviation, with curvature coinciding with the lower lip and without diastema. **Keywords:** Smile. Shape perception. Dental esthetics.

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» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

## Introduction

The term “aesthetics” comes from the Greek *αισθητική* or *aisthesis*: perception, sensation, sensitivity. The quest for having the perfect image is increasingly present in our daily routine, thus strengthening the role played by beauty and aesthetics.<sup>1</sup>

The concept of beauty has changed over the years, based on culture and socio-economic factors. Thus, it is paramount to acknowledge all existing diversity, so as to understand the hegemony surrounding the universe of body aesthetics, since there is some variation according to the context where it is inserted.<sup>1</sup>

An individual is composed of individual and social features which might change over the years. Thus, a quest to renew physical features can be seen.<sup>2</sup> Once facial appearance proves extremely important for social life, the role played by the smile is highlighted, as it is major in facial harmony.<sup>3</sup>

A natural, esthetically pleasing smile which is admired by everybody and the individual himself is responsible for an increasing search for treatment at the dental office. Esthetic standards advocated by society motivate individuals to seek more attractive and pleasing smiles.<sup>4</sup>

Therefore, dental professionals need to pay careful attention to diagnose facial changes and, thus, suggest proper treatment to

fulfil patient’s wishes.<sup>5</sup> Patients have become increasingly demanding and seek care to have their smile improved, while raising their self-esteem as a result of treatment carried out according to their facial pattern and individual features.<sup>6</sup>

Dentists and laypeople have different opinions regarding the assessment of the smile. For this reason, decision about esthetic treatment should be made together. The presence of minor deviation might be esthetically accepted; however, not all variations have the same degree of esthetic acceptance.<sup>7</sup> Therefore, Dental professionals must acknowledge that esthetic standards are not determined only by them, but also by society. As a result, they should be able to clarify about treatment and its limitations.<sup>8,9</sup>

Individuals with facial deformities are psychologically impaired and cause social impact; as a result, their self-confidence and social relationships are limited.<sup>10</sup> The literature has evinced the relationship between dental esthetic and/or facial appearance with one’s self-esteem, since dissatisfaction with dental and/or facial aesthetics results in decreased self-esteem.<sup>10-13</sup>

Facial features considered as being the most attractive are the shape of the eyes and teeth. The major characteristics taken into account for esthetic smile assessment are: are: of teeth; the quality of restorations; upper lip position; visibility of teeth; gingival exposure; smile line following lower lip curvature; symmetrical central incisors and symmetrical gingival margin of central incisors.<sup>4,11,14</sup>

A symmetrical smile, with well positioned and well aligned teeth in the arch, with proper display of maxillary teeth in the anterior region, in addition to harmony between white and pink esthetics, comprise the ideal beauty which supplements facial beauty.<sup>4,7</sup>

The golden ratio was established by the Greek and is extremely useful, especially regarding concepts of symmetry, balance and harmony. Numerically represented by the value of 0.618 (the golden number), it is based on visual perception in the quest for esthetics.<sup>15</sup> It was planned to allow standardization of facial harmony, based on the ratio established among different elements. The ratio was incorporated by Dentistry with a view to enhancing facial harmony and providing psychological benefits.<sup>16</sup>

Alber's and Plato's ratios, in theory, and whenever confirmed, offer attractiveness and beauty to the dental set. Value is achieved by estimating the ratio between the width of central incisors and canines. The values for those ratios are 0.71 for Alber's ratio and 0.58 for Plato's ratio, respectively.<sup>4</sup>

Based on the assumption that society has become increasingly demanding as regards beauty standards, and that the dental professional needs to pay close attention to a number of dental changes, the objective of this study was to assess and compare the esthetic perception of laypeople and dental undergraduate students.

### **Material and Methods**

This study was approved by the local Institutional Review Board (protocol: #12641013.9.0000.5188). The sample was composed of 50 laypeople from Universidade Federal da Paraíba (UFPB) who sought dental treatment or had already undergone treatment, and 50 dental undergraduate students randomly selected from the ten periods of the undergraduate course.

Data were collected by a researcher, after an informed consent form was signed by patients. It consisted of forms with questions and images extracted from studies conducted by Rodrigues.<sup>17</sup> Each requisite relative to the images comprised three types of smile: an image classified as the "ideal" smile, whereas the other two had some kind of deviation.

The first criterion assessed was the midline. The ideal image is characterized by absence of midline deviation (A); whereas the other two photographs had 2-mm and 3-mm deviations, respectively (B and C).

The second criterion assessed was tooth ratio. The images were subjected to changes, so as to modify the width of six anterior teeth. They were classified according to the following ratios: (A) Golden ratio (62%), (B) Plato's ratio (58%) and (C) Alber's ratio (71%).

Smile line was the third criterion to be assessed. Images revealed displaced central and lateral incisors and cut incisal edges. Three images were obtained: in the ideal photograph, curvatures were coinciding (A); the second photograph had a straight smile line (B); whereas the third photograph had an inverted smile line (C).

The fourth change created was the presence of diastema between central incisors: the first image had no diastema (A); and two different diastemata (0.5-mm and 1-mm) were created to simulate potential clinical cases (B and C).

Data were displayed in tables, subjected to descriptive statistical analysis and represented in tables.

## Results

### Laypeople

Most laypeople, considering all 50 interviewees, the smile hinders or affects their personal relationships at different degrees (Table 1). A total of 49 interviewees answered that an unpleasant smile leads them to hide their mouth during conversation.

As for self-perception of the smile, 26 interviewees believed their smile was “little

or not at all satisfactory.” Tooth alignment (20 answers), color (14 answers) and shape (11 answers) were the major complaints..

As regards the influence of facial esthetic standards shown on TV, 70% of interviewees thought to be little or not at all influenced. A total of 46% considered actors’ smiles as being extremely satisfactory. Brazilian actors most often mentioned were Reinaldo Gianechini (10 answers) and Caio Castro (9 answers); whereas Brazilian actresses most often mentioned were Giovana Antonelli (6 answers) and Paola Oliveira (4 answers). Answers concerning the images are displayed in Table 2.

**Table 1:** Absolute distribution and percentage of laypeople’s knowledge about esthetic perception.

QUESTIONS	NO	LITTLE(A)	LOT(A)	NO ANSWER
Do you believe your smile hinders or affects your personal relationships, for instance, conversations among friends and at work?	16 (32%)	20 (40%)	14 (28%)	-
Do you believe you have a satisfactory smile?	2 (4%)	24 (48%)	23 (46%)	1 (2%)
In your opinion, what is the importance of beautiful teeth and an attractive smile to your personal and professional social life?	1 (2%)	24 (48%)	25 (50%)	-
Do you believe you are influenced by facial esthetic standards shown on TV?	11 (22%)	24 (48%)	15 (30%)	-
Do you consider TV actors' smile to be the most satisfactory?	9 (18%)	17 (34%)	23 (46%)	1 (2%)

**Table 2:** Absolute distribution and percentage of laypeople's knowledge on the type of smile.

CRITERION	A	B	C	NO ANSWER
Midline	28 (56%)	14 (28%)	8 (16%)	-
Tooth ratio	14 (28%)	25 (50%)	6 (12%)	5 (10%)
Smile line	43(86%)	4 (8%)	1 (2%)	2(4%)
Presence of diastemata	47 (94%)	1(2%)	0 (0%)	2(4%)

### Undergraduates

Most undergraduates, taking all 50 interviewees into account, believe their smile strongly hinders or affects their personal relationships (Table 3). All of them claimed that having an unpleasant smile causes them to hide their mouth during conversation. As for self-perception of the smile, 26 interviewees believed their smile was “extremely satisfactory.” Tooth alignment (20 answers), color (13 answers) and shape (7 answers) were the major complaints.

As regards the influence of facial aesthetic standards shown on TV, 54% of interviewees thought to be little or not at all influenced. A total of 58% considered actors' smiles as being extremely satisfactory. Brazilian actors most often mentioned were Reinaldo Gianechini (6 answers) and Kleber Toledo (6 answers); whereas Brazilian actresses most often mentioned were Xuxa (5 answers) and Bruna Marquezine (4 answers). Answers concerning the images are displayed in Table 4.

**Table 3:** Absolute distribution and percentage of undergraduates' knowledge about aesthetic perception.

QUESTIONS	NO	LITTLE(A)	LOT(A)	NO ANSWER
Do you believe your smile hinders or affects your personal relationships, for instance, conversations among friends and at work?	8 (16%)	11 (22%)	31 (62%)	-
Do you believe you have a satisfactory smile?	-	24 (48%)	26 (52%)	-
In your opinion, what is the importance of beautiful teeth and an attractive smile to your personal and professional social life?	-	12 (24%)	38 (76%)	-
Do you believe you are influenced by facial aesthetic standards shown on TV?	4 (8%)	23 (46%)	23 (46%)	-
Do you consider TV actors' smile to be the most satisfactory?	3 (6%)	17 (34%)	29 (58%)	1 (2%)

**Table 4:** Absolute distribution and percentage of undergraduates' knowledge on the type of smile.

CRITERION	A	B	C	NO ANSWER
Midline	34 (68%)	10 (20%)	6 (12%)	-
Tooth ratio	12 (24%)	25 (50%)	8 (16%)	5 (10%)
Smile line	45 (90%)	1 (2%)	0 (0%)	4 (8%)
Presence of diastemata	46 (92%)	0 (0%)	0 (0%)	4 (8%)

## Discussion

The concept of beauty is determined by objective and subjective factors, with each individual establishing his or her own criteria. Therefore, disagreement among the assessed subjects can be explained by their individual perception of beauty.<sup>4,7</sup> In addition, it has been well described in the literature that beauty standards are influenced by external factors, such as the media, one's family, social group, professional activity geographic location and religion.

In the present study, laypeople and undergraduates believe that the smile hinders or affects. However, there was some difference between the studied groups: 28% (n = 14) of laypeople believed that the smile strongly affects them, whereas 62% (n = 31) of It is, thus, evinced that undergraduates value the smile at a greater extend in comparison to laypeople. It is possible to claim that, for most individuals from the sample, teeth are important for one's appearance, as stated by Feitosa et al.<sup>11</sup> Tooth alignment, shape and color were the major complains

presented by both groups, with alignment being the main reason for dissatisfaction, followed by shape and color. Those results corroborate the outcomes achieved by the study conducted by Feitosa et al.<sup>11</sup> Their study, revealed that changes in color, shape, texture and position of teeth can negatively affect aesthetic standards. Additionally, tooth alignment was the feature most often related to beauty (for 60% of patients and a 100% of undergraduates), followed by the white color of teeth (40% of patients); however, such a feature was not considered as the most important by undergraduates. For them, tooth color ranked in third, as it is the case of the present study. The presence of darkened teeth alludes to some degree of discomfort both by laypeople and undergraduates. Therefore, we should be prepared to assist, work and discuss with patients, who have become increasingly demanding, about aesthetics and facial harmony.<sup>6</sup>

A total of 24 laypeople (48%) believed to be little influenced by aesthetic standards shown on TV, whereas 15 (30%) believed to be extremely influenced. As for the undergraduates, 46% of them believed to be little influenced by aesthetic standards shown on TV, whereas 46% believed to be extremely influenced. A total of 23 (46%) of laypeople considered TV actors' smile as the most satisfactory, whereas for undergraduates the percentage was equal to 58% (n = 29). Thus, it is clear that the media exerts some influence on the

concept of beauty of both groups. França et al<sup>18</sup> believe that such an influence can be explained by the display of extremely white smiles, which often interferes in the beauty standards patients seek. The results can be explained based on the arguments used by Amorim et al,<sup>19</sup> since the authors advocate that we are facing a phenomenon of smile “reification,” manifested by society through images disclosed by the media which determines beauty and aesthetics in Dentistry. Additionally, beauty standards propagated by the media bring along the social consequence of an increasing worship of physical beauty.

In the second half of the form, which included the images, the first criterion assessed was midline deviation. A total of 56% of laypeople classified the ideal smile as having absence of midline deviation. As for undergraduates, 68% (n = 34) considered as ideal the smile without midline deviation. There was some variation, in which undergraduates were more sharp, as the majority opted for a smile without deviation. However, a considerable number of laypeople was also capable of noticing some degree of change in the other smiles and opted for the one without deviation, as it seemed more aesthetic and pleasing. The results achieved in the present study disagree with the findings by Rodrigues et al,<sup>4</sup> in which midline deviation with mean values ranging from 2 to 3mm hindered smile attractiveness for dentists, but not for laypeople. In the study conducted by Normando et al,<sup>20</sup> images classified as unacceptable by laypeople were those with deviation greater than 3mm. The present

study revealed that laypeople aesthetically perceive midline deviation similarly to undergraduates. Other studies support the finding<sup>3,4</sup> that a smile without deviation is more attractive. Leal et al<sup>21</sup> yielded similar results. In their study, orthodontists and laypeople assessed smile aesthetics in a very similar manner. This result can be explained by the influence exerted by the media which shows individuals with balanced facial features smiles, presenting parallelism between the incisal edges of maxillary teeth in the anterior region.<sup>11,18</sup>

The second criterion assessed was tooth ratio. For laypeople, the most satisfactory smile was that which was in accordance with Plato’s ratio (50%, n = 25), followed by the Golden ratio (28%, n = 14) and Alber’s ratio (12%, n = 6). A total of 10% (n = 5) of laypeople did not reply to this criterion. As for undergraduates, the most aesthetic types of smile ranked in the same order as laypeople: At first came the smile which met Plato’s ratio (50% n = 25), followed by the Golden ratio (24% n = 12) and, finally, Alber’s ratio (16%, n = 8). The result shows a similarity of aesthetic standards in both groups. Conversely, it disagrees with the findings by Rodrigues et al,<sup>4</sup> in whose study the smile meeting Alber’s ratio was considered as being more favorable in both groups, whereas the smile which met Plato’s ratio was less attractive to laypeople. Therefore, the sample studied has aesthetic standards that differ from the one advocated in the literature, the years, as it is influenced by culture and socioeconomical, geographic, social and family factors.<sup>1</sup> Therefore, the Golden ration should not be

the only alternative for aesthetic procedures,<sup>4</sup> since in order to achieve success in dental treatment, patient's satisfaction should also be taken into account. Thus, it is important to highlight that a smile considered as being highly aesthetic may not be accepted by everybody due to subjective evaluation.<sup>4</sup>

The next criterion assessed was smile line. Laypeople and undergraduates in which curvatures were coinciding, with 86% (n = 43) of laypeople and 90% (n = 45) of undergraduates. The present study reveals that both laypeople and undergraduates considered a straight, inverted smile line as being nonaesthetic. Similar results were found by other studies.<sup>4,7,9</sup> Once more, this reveals the existence of some agreement between the assessed groups. In dental practice, the result is considered satisfactory, once understanding patient's expectations and aesthetic perception can contribute for the success of aesthetic treatment.<sup>4</sup> It is necessary that there is integration between dental specialties, which leads to better aesthetic treatment outcomes and opens up treatment possibilities.

The last image assessed had photographs without diastemata, with 1-mm diastema and 2-mm diastema. The photograph without diastema pleased 94% (n = 47) of laypeople interviewed.

Diastema-free smile was considered more aesthetic by all undergraduates who responded to this criterion (92% n = 46). Four undergraduates did not respond to

this criterion. Both groups agreed; in other words, the presence of diastema implies in aesthetic impairment for both groups. Similarly, other studies reported aesthetic impairment as a result of diastema.<sup>3,4,9</sup>

Agreement among some of the aspects involved in the assessment can be explained by the origin and cultural influence of evaluators.<sup>1,4</sup>

## Conclusions

- The smile hinders or affects personal relationships, both for laypeople and undergraduates. For the latter, it is of greater importance.
- As for self-perception of the smile, the majority of laypeople considered having a "little or not at all satisfactory" smile. Most undergraduates considered as having an "extremely satisfactory" smile.
- Tooth alignment, color and shape are features that bother both groups the most.
- Both groups assessed considered as being influenced by the aesthetic standards shown on TV, at different degrees.
- For both groups, the most attractive types of smile were those without midline deviation, with curvature coinciding with the lower lip and without diastemata.



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