

## Analysis of Smile Perception in Laypersons and Orthodontists: A Cross Sectional Comparative Study

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**DOI:** 10.31080/ASDS.2022.06.1388

**Received:** March 23, 2022

**Published:** May 23, 2022

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### Abstract

**Objective:** Smile aesthetic is a major concern among patients and orthodontists. The aim of the study was to evaluate the perception of different smile attributes amongst laypersons and orthodontists in treated class II malocclusion cases and to analyze the pre- and post-treatment smile in treated class II division I cases in comparison to ideal smile on VSA (Visual Analog Scale).

**Methods:** A cross sectional comparative study which was done to compare the macro attributes of smile esthetics such as alignment, large size incisor, incisal show, smile, exposure of gingiva, tooth and gingival colour. 22 laypersons and 22 orthodontists were surveyed in the study. Pre- treatment (Figure-1) and post-treatment(Figure-2) smile photograph of class II division I treated patients were obtained from the

departmental records. The smile photographs were shown to the laypersons and orthodontists. The visual analogue scale was given to each to rate it from 0 to 10, with 0 being least attractive to 10 being most attractive. The patients and orthodontists were also asked to state the reason for their rating.

**Results:** the average smile rating is higher for the laypersons which is even statistically significant [p-value < 0.05], at 5% level of significance. Findings suggested that the average smile and the distribution of smile esthetics is not same across the groups, that is, it varies between the groups. The results were statistically significant [p- value < 0.005] at 5% level of significance, on the basis of p-value further indicating the rejection of null hypothesis.

**Conclusion:** The group conducting strict smile assessment was the Orthodontist group. The average smile and the distribution of smile esthetics is not same across the groups, that is, it varies between the groups. The results were statistically significant.

**Keywords:** Smile Analysis; Smile Aesthetic; Macro Aesthetic; Orthodontist; Layperson

## Introduction

Esthetics is one of the goals of Orthodontic treatment, whereas it is the primary area of concern for the presenting patient. Anterior teeth play a pivotal role in the appearance of an individual. The components of the classification of appearance and esthetics are macro-esthetics, mini-esthetics and micro-esthetics. Micro-esthetics includes the assessment of tooth proportions, gingival shape and contour, embrasures and tooth shade. Among all these factors, the tooth proportions play an important role in micro-esthetics [1]. The maxillary anterior teeth size, shape, and arrangement is the most influential factor for harmonious appearance, particularly when viewed from front [3]. Smile aesthetics has become a major concern among patients and orthodontists. Thus it holds a detailed evaluation in orthodontic diagnosis and treatment planning. It is also necessary to scientifically understand smile pleasantness from the point of view of laypeople and patients [2]. In order to obtain a clinically satisfactory outcome, what is beautiful and attractive to the orthodontist and general dentists might not seem attractive to the patients [4].

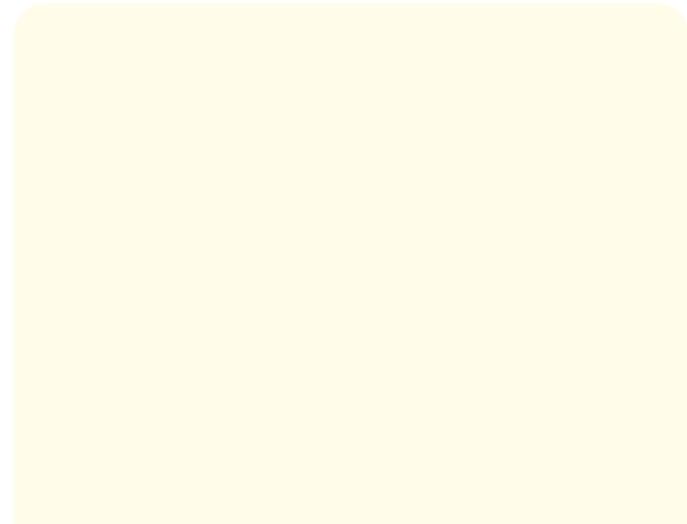
This study is aimed to understand the perception of patients, which often are not given the due importance in the treatment planning. As the esthetics is one of the goals of the orthodontic treatment for the patients and orthodontists as well, this study was conducted to evaluate various attributes in smile and to decide its important in treatment planning.

The aim of the study was to evaluate the perception of different smile attributes amongst laypersons and orthodontists in treated class II malocclusion cases and to analyze the pre- and post-treatment smile in treated class II division I cases in comparison to ideal smile on VSA (Visual Analog Scale). The null hypothesis was the average smile is same across both orthodontists and laypersons and the distribution of smile esthetics is same across both orthodontists and laypersons.

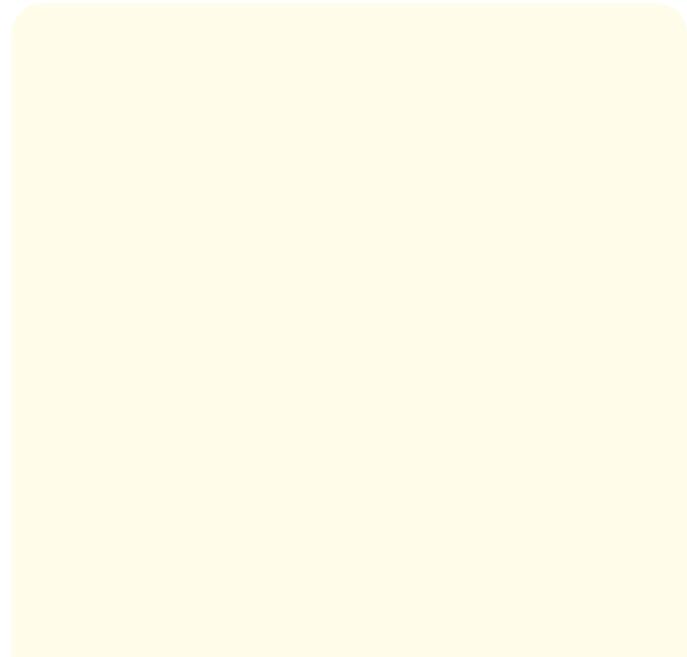
## Materials And Methods

The study was conducted in Department of Orthodontics and Dentofacial Orthopaedics, Manubhai Patel dental college, Hospital and ORI. It was a cross sectional comparative study which was done to compare the macro attributes of smile esthetics such as alignment, large size incisor, incisal show, smile, exposure of gingiva, tooth and gingival colour. 22 laypersons and 22 orthodontists were surveyed in the study. Pre-treatment (Figure 1) and post-treatment (Figure 2) smile photograph of class II division I treated

patients were obtained from the departmental records. The smile photographs were shown to the laypersons and orthodontists. Standardized frontal facial smile photographs [5] of patient's smile were used for analysis. The photographs were taken in patient's natural head posture with Canon EOS 1300D camera, and standardized with the same background. The photographs were cropped using Google picasa version 3.9.



**Figure 1:** Pre treatment smile photograph.



**Figure 2:** Post treatment smile photograph.

The visual analogue scale was given to each to rate it from 0 to 10, with 0 being least attractive to 10 being most attractive. The patients and orthodontists were also asked to state the reason for their rating from the following six smile attributes after explaining about them: due to large size incisor, incisal show, smile line, smile arc, buccal corridors, tooth and gingival color.

**Results**

Table 1 depicts the value obtained by descriptive statistical analysis along with the mean differences for the subjective smile esthetics assessment between the two different groups of individuals namely the orthodontists and the laypersons. Findings from this table shows that the average smile rating is higher for the laypersons which is even statistically significant [p- value < 0.05], at 5% level of significance.

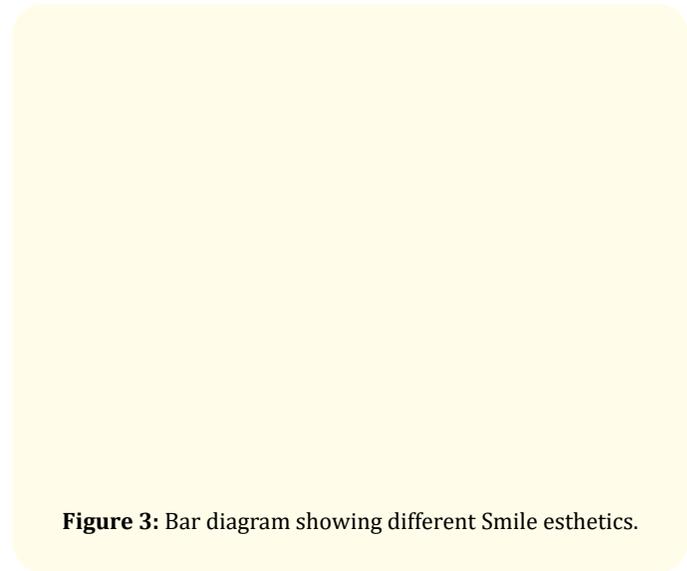
	Orthodontists	Laypersons	Mean difference (between groups)	p-value
Mean	6.82	8.32	1.5	0.001
Standard Deviation	1.44	1.39		
Median	7.00	8.50		

**Table 1:** Descriptive Statistics and their mean differences for subjective smile aesthetics assessment.

Null Hypothesis	Test	P-value	Decision
The average smile is same across both orthodontists and laypersons	Independent sample median test	0.008	Reject the null hypothesis
The distribution of smile esthetics is same across both orthodontists and laypersons	Independent sample Kruskal- Wallis test	0.002	Reject the null hypothesis

**Table 2:** Median test and Kruskal-Wallis test for group differences.

Table 2 shows the results for median test and Kruskal-Wallis test for group differences. Findings from this table suggests that the average smile and the distribution of smile esthetics is not same across the groups, that is, it varies between the groups. The results were statistically significant [p-value < 0.005] at 5% level of significance, on the basis of p-value further indicating the rejection of null hypothesis.



**Figure 3:** Bar diagram showing different Smile esthetics.

**Discussion**

In the present study, scores varied between 7 to 10 in Layperson group and between 6 to 9 in group of orthodontists. In other words, in the sample studied acceptable smiles were most prevalent. However, each group gave different reasons for rating, which suggested that there were different features to classify the same smile as pleasant or unpleasant.

Orthodontists emphasized the amount of smile line and incisal display for smile aesthetics. Laypeople, on the other hand, emphasized on smile line as the features that most contribute to a smile. One sample in layperson group observed that midline was shifted in smile photograph, while 4 samples from orthodontist group observed that midline was shifted. Two orthodontist commented that incisal edge was not following the lower lip line, while one observed that occlusal cant was present in smile photograph.

In all groups, large size incisors were less associated with smile unpleasantness.

According to Van der Geld., *et al.* [9] smiles characterized by total exposure of clinical crowns and gingival display not greater than 1 mm were considered more aesthetic. In the present study, orthodontists evinced the amount of smile line and incisal display for smile aesthetics.

Several studies confirm that orthodontist and layperson judge facial aesthetics differently, so this study mainly focus on judgement of smile aesthetic by layperson as they were the primary consumer of orthodontic services [6-8].

Orthodontists were more likely to judge variables like smile arc and buccal corridor.

However, these variables did not affect the laypersons much. This was also observed by Amjad Al Taki., *et al.* [10] Smile attractiveness most commonly affected by the lips, gums, and teeth and seemed to be affected most by the teeth. Here in this study raters' age, gender and occupation did not significantly affect the ratings of smile attractiveness.

We believe that beauty is subjective and, for this reason, establishing aesthetic protocols for diagnosis and treatment planning based on orthodontists, and laypeople's perception might be a difficult task.

## Conclusion

The null hypothesis was rejected. The group conducting most strict smile assessment was Orthodontist group. The average smile and the distribution of smile esthetics is not same across the groups, that is, it varies between the groups. The results were statistically significant. Laypeople were more concerned about Smile line, whereas orthodontists evinced incisal show, smile line, smile arc, buccal corridor.

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