



# Esthetic Preferences In Relation Tobuccal Corridor And It's Perception On Smile Esthetics Among Orthodontists, General Dentists, And Laypersons - A Photographic Study.

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Submitted: 15-03-2022

Accepted: 23-03-2022

## ABSTRACT:

**BACKGROUND AND OBJECTIVES OF THE STUDY:** Aesthetics in dentistry has increasingly become a major concern for patients and often serves as a primary reason for seeking dental care. So the purpose of this study is to assess and compare the deviations in photographs of male and female subjects of buccal corridor preferences in smile aesthetics in relation to Orthodontists, General dentists and Laypersons.

**METHODOLOGY:** A profile photograph of a male and female subject was digitally modified to create 8 photographs each of buccal corridor. Three groups of raters were selected. A total of 60 raters (20 Orthodontists, 20 General Dentists, 20 Laypersons) were asked to score each photograph using a VAS rating scale. Kruskal-Wallis and Mann-Whitney tests were used to analyze the data.

**RESULTS:** Results of this study showed the perception of buccal corridor exposure preferences in dental aesthetics by laypeople, general dentists, and orthodontists. Mean VAS scores between 3 groups at 2mm distance on the buccal corridor, for the male and female photograph, was statistically significant at  $P < 0.001$ .

**CONCLUSION:** Buccal corridor played an important role in the esthetics of smile. All 3 groups preferred the buccal corridor at 2mm as the most esthetic.

## I. INTRODUCTION:

Aesthetics is defined as "a area of philosophy dealing with the nature of beauty, art, and taste, as well as the creation and appreciation of beauty" by Merriam-Webster<sup>1</sup>. Physical attractiveness is a major social issue in our culture, and one of the most essential elements is the face. Pleasing facial profile esthetics result from relative harmony between the morphology and prominence of various facial structures observed in profile view.

It is considered a blend of imaginative components directed by science. Esthetics is integral to dentistry with regards to building a charming smile that supports people's certainty and works on their nature of life. The acknowledgment of this significant job of feel has prompted fast advancement in this field, prompting further sub-partitioning the idea into macro, mini, and micro esthetics<sup>2</sup>.

Smile is an essential asset for psychosocial adaptation in people with beautiful teeth and smiles are considered more attractive, more intelligent, and more popular with the opposite gender<sup>3</sup>. Evaluating the face in the smiling profile is an integral part of complete orthodontic treatment<sup>4</sup>. The clinical success to treating an orthodontic patient is determined by an understanding of the patient's soft tissue, treatment limitations, and the extent to which orthodontist or multidisciplinary treatment can satisfy the patient's and orthodontist's aesthetic goals<sup>5</sup>.

## II. AIMS AND OBJECTIVES

The aims and objectives of this study is :

- i. To assess buccal corridor preferences in smile aesthetics.
- ii. To assess the perception of Orthodontists, General dentists and Laypersons.
- iii. Comparison of raters judging the male and female photographs in relation to buccal corridor preferences in smile esthetics.

## III. METHODOLOGY

1 female and 1 male student of age 20-30 years were chosen from the institution with a good facial proportion with Skeletal Class I profile, attractive smile, and follow the principles of ideal smile with inclusion and exclusion criteria of the study. A color photograph of each subject was taken in a natural head position while sitting. 3 groups of raters were selected. The subjects are explained about the type of the study and consent is



obtained from them regarding the same. The first group consisted of 20 laypeople in the age group of 21 to 60 years who were selected among the patients visiting the Department of Orthodontics and Dentofacial Orthopaedics. The second group consisted of 20 General Dentists who were selected randomly in Bangalore city. The third group consisted of 20 Orthodontists who were selected randomly in Bangalore city.

**INCLUSION CRITERIA:**

Frontal facial image

1. Subjects having a good facial proportion and Skeletal Class I profile.
2. Subjects having good dental alignment and tooth size symmetry.
3. Subjects having an average smile line, revealing 100% of the maxillary anterior teeth.

**EXCLUSION CRITERIA:**

Frontal facial images

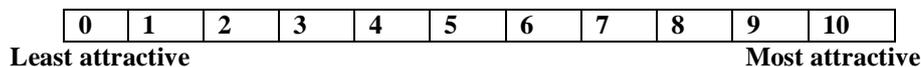
1. Restored anterior teeth.
2. Abraded anterior teeth.
3. Attrited anterior teeth
4. Anterior tooth size asymmetry.
5. History of traumatic injuries.

**PROCEDURE:**

Identification of the subjects based on inclusion criteria and exclusion criteria. Standard photographs of a male and female subject matching the inclusion criterion were obtained using a NIKON D3500 DSLR camera with the subject maintaining the natural head position at a standard 1x1 magnification. (SUBJECT M AND F) .24 Colour photographs of smiles portrayed in both male and female booklets with the following variables. The buccal corridor was compared at 0mm, 2mm, 4 mm, and 6mm for both male and female booklets.

A visual analogue scale (VAS) beside each photograph is used to record the judges' ratings. Each judge is directed to evaluate only the maxillary anterior teeth and to mark on the VAS beside each photograph. Written instructions explain the marking along the VAS indicates how attractive the maxillary teeth. The center line on the VAS indicates average attractiveness, and marks located to the right or the left indicate progressively more or less attractive maxillary teeth, respectively. The distance from the left end of the VAS is expressed as a percentage of the total VAS. Judges are also asked to indicate their sex, age category, and race by checking the appropriate boxes.

**Figure 1: Visual Analogue Scale(VAS)**



**Figure 2: SUBJECT M AND F -EXTRA ORAL SMILE PHOTOGRAPHS OF IDEALLY ALIGNED TEETH**



**IV. DATA ANALYSIS:**

One-way ANOVA test followed by Tukey's HSD Post hoc Analysis will be used to compare the mean preference rating scores for buccal corridor space between three groups for male and female photographs.

Independent Student t-Test will be used to compare the mean preference rating scores for buccal corridor space between genders in each group of male and female photographs. The level of significance [P-Value] will be set at P<0.05.



**Figure3 :SUBJECT F1 – BUCCAL CORRIDOR AT 0mm.**



**Figure 4: SUBJECT F2 - BUCCAL CORRIDOR AT 2mm**



**Figure 5: SUBJECT F3 - BUCCAL CORRIDOR AT 4mm**





**Figure 6: SUBJECT F4 - BUCCAL CORRIDOR AT 6mm**



**Figure 7: SUBJECT M1 - BUCCAL CORRIDOR AT 0mm**



**Figure 8: SUBJECT M2 - BUCCAL CORRIDOR AT 2mm**





**Figure 9: SUBJECT M3- BUCCAL CORRIDOR AT 4mm**



**Figure 10: SUBJECT M4 - BUCCAL CORRIDOR AT 6mm**



**V. RESULTS:  
 TABLE 1**

Comparison of mean VAS scores for Buccal Corridor at different distances b/w 3 groups for Male Photograph using One-way ANOVA test followed by Tukey's Post hoc Test									
Distance	Groups	N	Mean	SD	Min	Max	P-Value <sup>a</sup>	Sig. Diff	P-Value <sup>b</sup>
0mm	Lay person	20	8.80	0.89	7	10	<0.001*	L vs D	0.11
	Dentist	20	8.25	0.91	7	10		L vs O	<0.001*
	Orthodontist	20	7.60	0.75	6	9		D vs O	0.04*
2mm	Lay person	20	8.20	0.95	7	10	<0.001*	L vs D	0.02*
	Dentist	20	8.90	0.72	8	10		L vs O	<0.001*
	Orthodontist	20	9.40	0.60	8	10		D vs O	0.11
4mm	Lay person	20	7.75	0.97	6	9	<0.001*	L vs D	<0.001*
	Dentist	20	5.55	1.00	4	7		L vs O	<0.001*
	Orthodontist	20	5.65	0.75	4	7		D vs O	0.94
6mm	Lay person	20	5.95	0.95	4	7	<0.001*	L vs D	<0.001*
	Dentist	20	3.60	0.82	2	5		L vs O	<0.001*
	Orthodontist	20	3.00	0.92	2	5		D vs O	0.10

\* - Statistically Significant  
 Note: a. P-Value derived by One-way ANOVA Test  
 b. P-Value derived by Tukey's Post hoc Test  
 L indicates Layperson; D indicates Dentist; O indicates Orthodontist

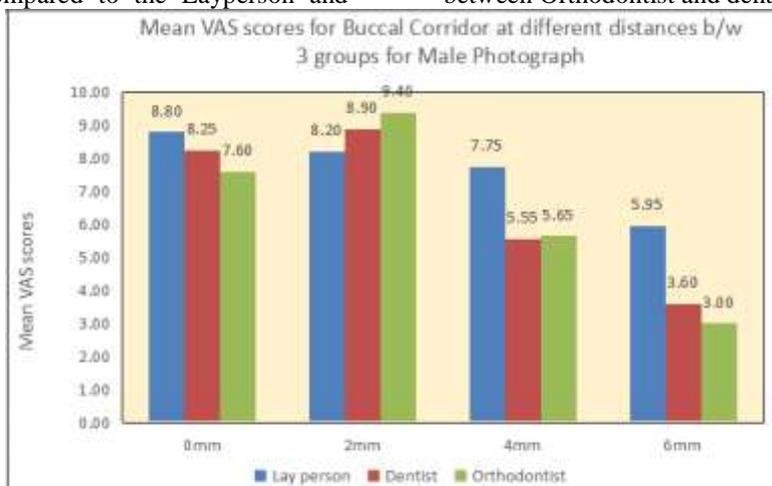
**Inference:** The test result showed that the mean VAS scores for the buccal corridor at 2mm for the Layperson group were  $8.20 \pm 0.95$ , for the dentist group was  $8.90 \pm 0.72$ , and Orthodontist group was

$9.40 \pm 0.60$ . This difference in the mean VAS scores between the 3 groups at a 2mm distance on the buccal corridor for the male photograph was statistically significant at  $P < 0.001$ . Multiple



comparisons between groups revealed that orthodontists showed significantly lesser mean VAS scores as compared to the Layperson and

Dentist group at  $P < 0.001$  &  $P = 0.04$  respectively. However, no significant difference was noted between Orthodontist and dentist groups [ $P = 0.11$ ].



**Graph 1** Mean VAS scores for the buccal corridor at different distances between 3 groups for male photographs.

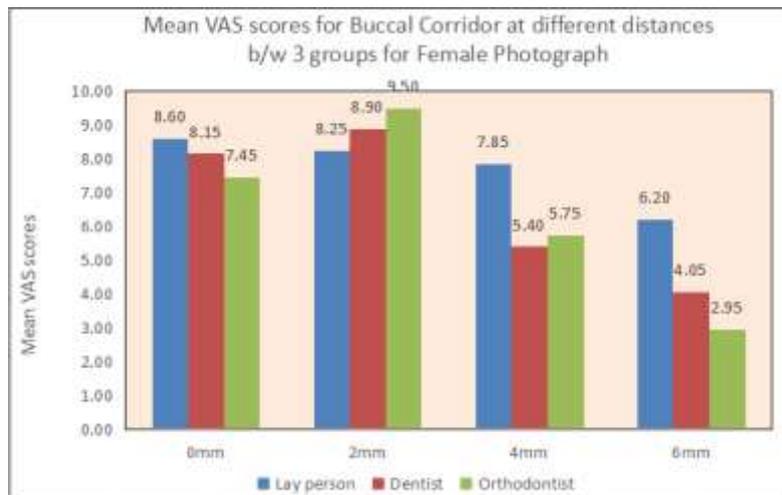
**TABLE 2**

Comparison of mean VAS scores for Buccal Corridor at different distances b/w 3 groups for Female Photograph using One-way ANOVA test followed by Tukey's Post hoc Test									
Distance	Groups	N	Mean	SD	Min	Max	P-Value <sup>a</sup>	Sig. Diff	P-Value <sup>b</sup>
0mm	Lay person	20	8.60	0.94	7	10	<0.001*	L vs D	0.28
	Dentist	20	8.15	0.93	7	10		L vs O	<0.001*
	Orthodontist	20	7.45	0.89	6	9		D vs O	0.04*
2mm	Lay person	20	8.25	0.72	7	10	<0.001*	L vs D	0.008*
	Dentist	20	8.90	0.72	8	10		L vs O	0.001*
	Orthodontist	20	9.50	0.51	9	10		D vs O	0.02*
4mm	Lay person	20	7.85	0.59	7	9	<0.001*	L vs D	<0.001*
	Dentist	20	5.40	1.00	4	7		L vs O	<0.001*
	Orthodontist	20	5.75	0.64	5	7		D vs O	0.32
6mm	Lay person	20	6.20	0.77	5	8	<0.001*	L vs D	<0.001*
	Dentist	20	4.05	0.89	2	5		L vs O	<0.001*
	Orthodontist	20	2.95	0.89	2	5		D vs O	<0.001*

\* - Statistically Significant  
Note: a. P-Value derived by One-way ANOVA Test  
b. P-Value derived by Tukey's Post hoc Test

**Inference:** The test result showed that the mean VAS scores for the buccal corridor at 2mm for the Layperson group was  $8.25 \pm 0.72$ , for the dentist group was  $8.90 \pm 0.72$  and the Orthodontist group was  $9.50 \pm 0.51$ . This difference in the mean VAS scores between the 3 groups at a 2mm distance on the buccal corridor for the female photograph was

statistically significant at  $P < 0.001$ . Multiple comparisons between groups revealed that orthodontists showed significantly lesser mean VAS scores as compared to the Layperson and Dentist groups at  $P < 0.001$  &  $P = 0.04$  respectively. However, no significant difference was noted between orthodontists and dentist groups [ $P = 0.11$ ].



**Graph 2:** Comparison of mean VAS scores for Buccal Corridor at different distances between 3 groups for Female Photograph.

## VI. DISCUSSION:

The creation of a nice and appealing appearance after orthodontic treatment is a clear expectation. Even though the treatment outcome is optimal in terms of teeth alignment, tip, and torque, the patient may not be satisfied with the cosmetic result. Therefore, the purposes of the present study were to evaluate the perception of Orthodontists, Dentists, and Laypersons' preferences of the buccal corridor in smile esthetics.

The buccal corridor is more commonly referred to by orthodontists as negative space present between the lateral aspects of maxillary posterior teeth and the corner of the mouth during smile which appears as a black or dark space. One of the numerous factors determining smile aesthetics indicates that orthodontists, dentists, and laypeople prefer smiles with no or small Buccal corridors over those with large Buccal corridors. As in the present study, the highest ratings were given to the buccal corridor having 2 mm space and then second-highest was given to 0 mm space or no buccal corridor, and the least scores were given to large and very wide buccal corridors. Female photographs were rated higher as compared to male photographs in the multiple comparisons but were not statistically significant. Since smaller buccal corridors were perceived to be more attractive than larger Buccal corridors, orthodontists might consider maximizing maxillary width when it does not compromise other treatment goals.

## VII. CONCLUSION:

The result showed that Orthodontists, general dentists, and laypeople share more similarities than differences when considering dental esthetic values. However, important

differences between these groups were identified. With a greater awareness of these similarities and differences, practitioners will be able to create treatment plans that take into account both the patient's and the dental professional's aesthetic preferences. Furthermore, aesthetic values can vary widely amongst patients. Laypeople are less discriminating than dentists and orthodontists in their perceptions of Buccal corridor size. Even while the laypeople did not have any distinct preferences as a group, they did have clear individual preferences.

The results of this study showed the perception of the buccal corridor, in dental aesthetics by laypeople, general dentists, and orthodontists.

The following conclusions were reached as a result of the research.

1. Buccal corridor played an important role in the esthetics of smile.
2. All 3 groups preferred buccal corridor at 2mm as compared to 0mm, 4mm, and 6mm.
3. General dentists and orthodontists preferred the standard buccal corridor in the Female images more than male images.
4. In general, laypeople scored all of the Male and Female images much higher than the orthodontists and general dentists.
5. Lay people tended to be less critical than dental professionals.
6. General dentists tended to be more critical than laypeople when evaluating buccal corridor.
7. Orthodontists tend to be more critical and precise than General Dentists and Laypersons.
8. The female photographs were judged less critical than male photographs when evaluating, but not much of statistical difference was found when comparing.



9. There are no age group differences in attractiveness ratings in relation to the buccal corridor.

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