

# Smile as perceived by orthodontists and general practitioners

Rabia Bilal<sup>a</sup>, Bilal Arjumand<sup>b</sup>, Sehrish Raheem<sup>c</sup>, Omer Shabir<sup>d</sup>, Quddisia Kanwal<sup>e</sup>

## Abstract

**Introduction:** A century ago, the orthodontic paradigm was geared towards achieving optimal occlusal contacts of the teeth and fifty years ago cephalometrics based diagnosis and treatment planning took over the orthodontic world. The present emphasis, however, is toward enhancing facial esthetics and creating a beautiful smile. This is all dependent on the perception of smile which tends to differ between orthodontists and other professionals. The objective of this study was to determine the perception of smile by orthodontists and general practitioners.

**Material and Methods:** 31 smile photographs were given to 13 orthodontists and 13 general practitioners to rate them on attractiveness by using visual analogue scale on 6 attributes of smile mesh. SPSS version 17 for windows was used to analyze and compare the data.

**Results:** There was no significant difference in the perception of a pleasing smile between the two groups, but the preferences varied between the two. There was weak correlation for different smile attributes between orthodontists and general practitioners.

**Conclusions:** There is a difference in preference of various smile attributes among orthodontists and general practitioners in rating them on the attractiveness of smile.

**Key Words:** Smile perception, smile attributes, orthodontists, general practitioners

## Introduction

Physical attractiveness is an important social issue and face is one of its key features. Peck and Peck<sup>1</sup> have reported hierarchy in the characteristics that determine aesthetic perception of a person, with face being the most important factor. Over the last decade smile aesthetics has gained immense importance in dentistry in general and orthodontics in particular.<sup>2</sup> Since the patient's decision to undertake orthodontic treatment is based primarily on aesthetic considerations, the evaluation and understanding of the factors that influence their decision is of key importance.<sup>3</sup>

We know that malocclusion and malaligned teeth result in less pleasing and unattractive

smile by affecting different smile attributes like smile arc,<sup>4</sup> smile line,<sup>5</sup> buccal corridors,<sup>6</sup> incisal show and gingival show. Tooth color, gingival color,<sup>7</sup> width to height ratios, embrasure space and gingival zeniths<sup>8,9</sup> are other very important attributes which affect the perception of pleasing smile.<sup>10</sup> Ackerman and colleagues described a morphometric analysis of smile by highlighting the importance of macro, micro and mini-esthetics.<sup>11</sup>

An understanding of the factors that help or harm the attractiveness of a smile is an important step in creating attractive smiles and these beauty norms and standards can be applied in line with diagnostic methods and esthetic treatment modalities.<sup>12</sup>

Perception aesthetics provides a philosophy to produce maximum and yet realistic treatment results and patient satisfaction. While influences can be, they are real factors which should be considered when evaluating and performing aesthetic treatment to achieve patient satisfaction. Attempts to quantify

<sup>a</sup> Corresponding Author: BDS, FCPS. Assistant Professor, Department of Orthodontics, Margalla College of Dentistry.

E-mail: [rabia.orthodontist@gmail.com](mailto:rabia.orthodontist@gmail.com)

<sup>b</sup> BDS. Senior Registrar, Department of Operative Dentistry, Margalla College of Dentistry.

<sup>c,d,e</sup> Final year BDS, Margalla College of Dentistry.

facial beauty date back to ancient Greeks, and a number of methods of assessing facial beauty exist.<sup>13</sup>

Aesthetic perception varies from person to person and is influenced by their personal experience and social environment. For this reason, professional opinions regarding evaluation of facial aesthetics may not coincide with the perception and expectations of patients, general dentists or lay people. Defining these attributes and prioritizing them within and between dentists and specialists allows predictable utilization in defining perception and subsequently providing patients with realistic goals and objectives.<sup>14</sup>

The aim of this study was to evaluate the perception of smile by orthodontists and general practitioners, to assess the most preferred smile attribute in smile assessment and correlation of smile rating.

## Material and Methods

This cross sectional comparative study was conducted between September to November 2010. The data was collected randomly at different departments of Margalla College of Dentistry. There were panels of orthodontists, endodontists and general practitioners who picked these pleasing faces randomly from the said institute. Pleasing faces were defined as profiles having normal facial proportions, attractive smiles, no dentofacial deformities, malocclusion or previous history of orthodontic treatment.

Consent was taken from 31 individuals and Images (frontal smiling views) of these individuals (both males and females) were taken at department of orthodontics, Margalla College of Dentistry (Figure 1). The photographs were taken by a single operator while the subjects were in a relaxed position. The photographs were taken at a fixed distance from the object and in true daylight. These images were given to 13 orthodontists and 13 general practitioners via e-mails to rate

them on attractiveness by using Visual Analogue Scale (VAS) from least to most attractive (Figure 2). A questionnaire with a smile photograph of each subject along with the visual analogue scale was given to each assessor to rate it from 0 to 100, with 0 being least attractive to 100 being most attractive. The assessors were also asked to state the reason for their rating from the following six smile attributes: smile line, smile arc, buccal corridors, incisal show, tooth and gingival color.

The smile line, smile arc, buccal corridors and incisal show constitute the mini-esthetics of smile mesh while tooth color and gingival color constitute the micro-esthetics of smile mesh. Descriptive statistics were used to determine the mean scores while paired sample t-test was used for comparing the mean scores. Spearman correlation coefficient was used to correlate different smile attributes among the two groups.

## Results

The results of this study determined the perception and preference between the two groups and both the outcomes were analyzed and compared. The scores allotted on VAS by the participants of both the groups were used to calculate the mean scores for each group i.e. orthodontists and general practitioners by using the descriptive statistics. The mean score of both the groups were compared by using paired sample t-test (Table I). The results showed that there was no significant difference between the mean scores of the two groups in rating the smile.

This shows that what was attractive for orthodontists was also attractive for general practitioners with insignificant difference.

When the percentage of preference for the six smile attributes was calculated separately for both the groups, it showed difference in the two (Figure 3). The orthodontists rated smile arc as the most preferred attribute while rating the attractiveness of smile (67%).



Figure 1: Few of the photographs given to the two groups for assessment

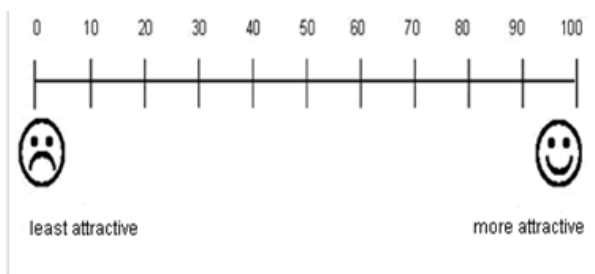


Figure 2: Visual Analogue Scale for assessing the photographs

This was followed by tooth color (13%), incisal show (8%), smile line (6%), gingival color (3%) and buccal corridors (3%). The general practitioners considered incisal show as most preferred attribute (27%) followed by smile arc (26%), smile line (23%) and tooth color (21%).

These four attributes were given almost equal importance in rating. This was followed by gingival color (1%). General practitioners did not consider buccal corridors in their ratings (Figure 4 and 5). When these percentage preferences were correlated by using spearman correlation co-efficient, most values were less than 0.5 showing very weak correlation in preference attributes between the two groups (Table II).

Table I: Mean of the scores and p value for both the groups

Pic No.	Orthodontic Scoring Mean (SD)	GP Scoring Mean (SD)	P Value
1	72.30(17.86)	75.00(15.00)	0.090
2	65.76(18.91)	54.23(17.05)	0.062
3	65.76(18.91)	46.53(15.19)	0.237
4	53.84(15.43)	54.23(12.72)	0.419
5	55.00(15.00)	66.92(15.48)	0.443
6	46.15(15.02)	46.92(14.93)	1.000
7	57.30(20.06)	55.00(18.48)	0.418
8	22.69(12.84)	27.30(21.07)	0.581
9	25.76(14.55)	31.92(17.97)	0.357
10	39.61(15.06)	46.53(22.11)	0.202
11	41.69(9.73)	47.69(18.66)	0.113
12	56.92(14.79)	56.92(14.79)	0.703
13	40.38(17.84)	40.38(17.84)	0.823
14	54.23(17.05)	54.23(17.05)	0.028*
15	22.30(18.09)	22.30(18.09)	0.156
16	34.61(19.19)	34.61(19.19)	0.012*
17	33.84(16.60)	33.84(16.60)	0.413
18	48.46(11.96)	48.46(11.96)	0.048*
21	56.92(9.69)	56.92(9.69)	0.149
22	22.69(17.27)	22.69(17.27)	0.241
23	56.92(13.77)	55.38(17.01)	0.092
24	25.38(14.35)	38.46(15.73)	0.485
25	38.07(10.71)	35.76(19.340)	0.604
26	51.92(16.27)	50.76(20.60)	0.063
27	45.38(13.45)	50.00(18.70)	0.089
28	19.61(13.91)	28.46(14.05)	0.853
29	57.30(11.47)	51.53(20.04)	1.000
30	42.69(18.32)	34.61(20.76)	0.200
31	49.61(15.20)	51.53(19.40)	0.784

The results helped us determine that there was no statistically significant difference in the perception of a pleasing smile but the preference for different smile attributes was different in both the groups and could not be correlated.

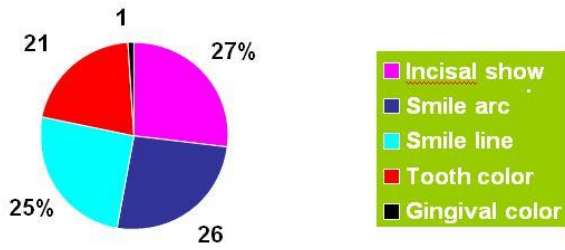


Figure 3: Percentage preference for different smile attributes by general practitioners

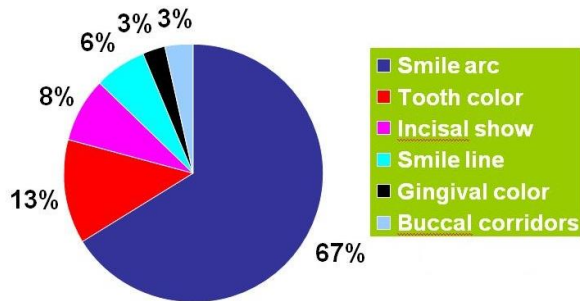


Figure 4: Percentage preference for different smile attributes by orthodontists

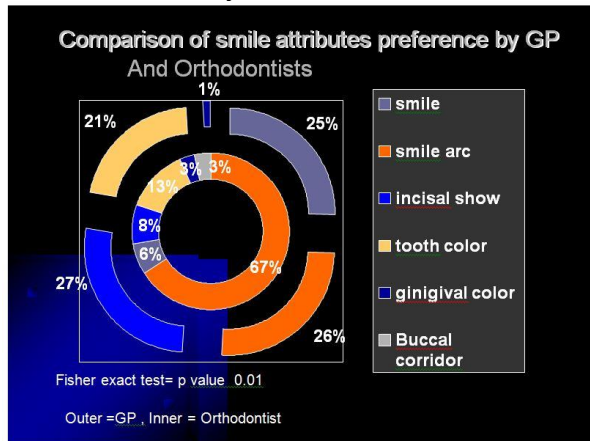


Figure 5: Percentage preferences by orthodontists and general practitioners

### Discussion

It is a well known fact that the perception of orthodontists often differs from that of the perception of other professionals and laypersons and that the aesthetic perception could differ for different ethnic groups as well. Many researchers including Zachrisson, Peck and Kokich have proposed various parameters for esthetic smiles,<sup>15,16</sup> but most of

Table II: Correlation between smile attributes amongst orthodontists and general practitioners

Picture no.	Spearman Correlation Co-Efficient	P Value
01	0.135	0.66
02	0.229	0.45
03	0.290	0.33
04	0.141	0.64
05	0.246	0.41
06	0.304	0.31
07	0.077	0.80
08	0.012	0.97
09	0.599	0.03
10	0.496	0.08
11	0.404	0.17
12	0.135	0.66
13	0.012	0.97
14	0.069	0.82
15	0.261	0.39
16	0.562	0.04
17	0.393	0.18
18	0.512	0.07
19	0.243	0.42
20	0.140	0.64
21	0.495	0.11
22	0.422	0.15
23	0.224	0.46
24	0.173	0.57
25	0.335	0.26
26	0.047	0.88
27	0.054	0.86
28	0.109	0.72
29	0.038	0.90
30	0.220	0.47
31	0.339	0.25

these studies were carried out on the western population. There have been very few studies done on Pakistani population. Hence, there was a need felt to evaluate how the

orthodontists and general dentists perceive and rate smile based on different smile attributes of micro and mini esthetics.

An understanding of the factors that help create the beautiful smiles is the need of hour of modern orthodontics. Orthodontists play an important role in creating beautiful smiles by correcting malocclusion and dentofacial deformities. The importance of smile has also gained wide popularity in cosmetic, restorative and prosthetic dentistry as well and with the growing demands of multidisciplinary dentistry these factors should be used along other diagnostic tools to assess the norms of beauty for creating pleasant smiles.

This study helped us to understand these factors and to appreciate the difference that exists between the perceptions of professionals from the same field but different disciplines. It also emphasizes the importance of having common expectation of treatment outcome especially during multidisciplinary cases so that optimum patient satisfaction can be ensured.

In this study there was no significant difference in the perception of orthodontists and general practitioners when it comes to rating a smile photograph as more or less pleasing and what was pleasing for orthodontists was also pleasing for general practitioners. When compared to the other studies on same subject as done by Kokich and Kiyak,<sup>17</sup> it was found out that there was no difference between the perception of smile between dentists and orthodontists.

But there was difference of preference among the two groups between mini and micro-esthetics of smile mesh of Ackerman and colleagues. The weak correlation between the two groups showed that both the groups had different reasons to rate the smile as more or less pleasing. Orthodontists preferred smile arc as the most preferred attribute followed by tooth color, incisal show, smile line, gingival color and buccal corridors. This preference was different in general

practitioners. They rated incisal show as the most preferred attribute, followed by smile arc, smile line and tooth color, although there was very small difference in preference between these four attributes. This was followed by gingival color. Buccal corridors were not given any preference in the rating of general practitioners, even if it was, this could not be detected due to the small sample size.

In another study done by Loi and Counts<sup>18</sup> the importance of buccal corridors was determined in rating the attractiveness of smile. It was found out that orthodontists were more sensitive to give importance to the buccal corridors in their rating as compared to general practitioners.

A study was done by Thomas and Reddy<sup>19</sup> in which changes in ideal smiles were made and were assessed both by dentists and orthodontists. The results showed that orthodontists were more sensitive in picking up minor deviations from ideal smile as compared to general dentists.

With the advent of modern aesthetic dentistry and rising demand for multidisciplinary approach, a common objective towards patient treatment while keeping in mind patients preference is of utmost importance. It is imperative and need of the hour to have consensus on the attractiveness of the most important attribute of aesthetics, i.e. smile. Thus there is a need for assessing all the attributes of micro and mini aesthetics to ensure best treatment outcome to the patients not only in orthodontics but during multidisciplinary therapy as well. It is also required that general practitioners and specialists from other fields of dentistry should emphasize the importance of these attributes during care provision to their patients.

## Conclusion

It is an established fact in the West that the perception of smile differs among different professionals and lay persons. However these parameters are established for the Western

population. This study aimed at evaluating the opinion of general practitioners and orthodontists which gave us insight of how the professionals in this part of the world perceive smile. The same perception of orthodontists and general practitioners for attractive smile shows that what is attractive for dentists is also attractive for orthodontist. But the difference of preference on smile attributes does exist. Esthetics is the rising demand of people seeking dental treatment hence making it imperative for the dental professionals to evaluate it on different attributes. With the dentistry emerging as having many sub specialties there should be a better understanding and more coherence between the dentists of different specialties to come up with the final treatment plan in multidisciplinary approaches.

## References

1. Peck S, Peck L. Selected aspects of the art and science of facial esthetics. *Semin Orthod.* 1995;1: 105-26.
2. Soh J, Chew MT, Wong HB. A comparative assessment of the perception of Chinese facial profile esthetics. *Am J Orthod Dentofacial Orthop.* 2005; 127:692-9.
3. Flores-Mir C, Silva E, Barriga MI, Lagravere MO, Major PW. Lay person's perception of smile aesthetics in dental and facial views. *J Orthod.* 2004; 31:204-9.
4. Sarver DM. The importance of incisor positioning in the esthetic smile: The smile arc. *Am J Orthod Dentofacial Orthop.* 2001;120:98-111.
5. Peck S, Peck L, Kataja M. Some vertical line measurements of lip position. *Am J Orthod Dentofacial Orthop.* 1992;101:510-24.
6. Krishnan V, Daniel ST, Lazar D, Asok A. Characterization of posed smile by using visual analog scale, smile arc, buccal corridor measures, and modified smile index. *Am J Orthod Dentofacial Orthop.* 2008;133:515-23.
7. Morley J, Eubank J. Macro-esthetic elements of smile design. *J Am Dent Assoc.* 2001;132:39-45.
8. Levin EL. Dental esthetics and golden proportion. *J Prosthet Dent.* 1978;40:244-52.
9. Sarver DM. Principles of cosmetic dentistry in orthodontics: Part 1. Shape and proportionality of anterior teeth. *Am J Orthod Dentofacial Orthop.* 2004; 126:749-53.
10. Nanda R. Biomechanics and esthetic strategies in clinical orthodontics. 1st ed. Connecticut: Elsevier Saunders ; 2005.
11. Proffit WR, Fields HW, Ackerman JL, Sinclair PM, Thomas PM, Tulloch JFC. *Contemporary Orthodontics.* 4th ed. St.Louis: Mosby; 2007.
12. Ackerman JL, Proffit WR, Sarver DM. The emerging soft tissue paradigm in orthodontic diagnosis and treatment planning. *Clin Orth Res.* 1999;2:49-52.
13. Prahl-Andersen B, Boersma H, Van der Linden FP, Moore AW. Perceptions of dentofacial morphology by laypersons, general dentists, and orthodontists. *J Am Dent Assoc.* 1979; 98: 209-12.
14. Tedesco LA, Albino JE, Cunat JJ, Green LJ, Lewis EA, Slakter MJ. A dental-facial attractiveness scale. Part I. Reliability and validity. *A J Orthod.* 1983; 83: 38-43.
15. Zachrisson BU. Esthetic factors involved in anterior tooth display and the smile: Vertical Dimension. *J Clin Orthod.* 1998; 32:432-45.
16. Kokich VO, Kiyak HA, Shapiro PA. Comparing the perception of dentists and lay people to altered dental esthetics. *J Esthet Dent.* 1999; 11:311-24.
17. Kokich VO, Kokich VG, Kiyak HA. Perceptions of dental professionals and laypersons to altered dental esthetics: Asymmetric and symmetric situations. *Am J Orthod Dentofacial Orthop.* 2006; 130:141-51.
18. Loi H, Nakata S, Counts A. Effects of buccal corridors on smile esthetics in Japanese: Angle Orthod. 2009; 79(4):628-33.
19. Thomas M, Reddy R, Reddy BJ. Perception differences of altered dental esthetics by dental professionals and laypersons. *Indian J Dent Res.* 2010; 22:242-7.