

# Tooth Architecture and Smile Aesthetics

## Qualitative Analysis by Students *versus* Patients



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### Introduction

Variations in tooth architecture parameters can influence patients and dentistry professionals concerning smile aesthetic perceptions.

### Objectives

Qualitative evaluation and comparison of patients and Dentistry Students' (DS) perceptions regarding tooth architecture parameters and smile aesthetic appearance.

### Material and Methods

An observational, cross-sectional study, approved by UFP - Ethics Committee. Two photographs (intraoral: maximum occlusion; extra-oral: smile) were taken to 35 patients (74.3% women) of CPMD-UFP. Patients completed the survey (Personalized Aesthetic Evaluation<sup>(1)</sup>), by self-assessment, after watching their own photographs. Thirty-eight FHS-UFP Dentistry students registered tooth micro/macro-aesthetic parameters (Aesthetic Checklist<sup>(2)</sup>) after observing the patients photographs. Descriptive and inferential statistics with chi-square tests ( $\alpha=0.05$ ) to compare both participant group regarding their evaluation (Table 1).

**Table 1** – Correspondence (pairing) between the questions of the patients survey with the questions of the dentistry students (DS) checklist for statistical data analysis.

Questions of the Aesthetic Survey applied to Patients	Questions of the Aesthetic Checklist applied to Dentistry Students (DS)
Do you like your tooth shade?	- The tooth shade is normal, with a small colour alteration, or a severe colour alteration?
Are your teeth very long? Or very small?	- The length of the anterior teeth is normal, increased or decreased?
Are your teeth crowded?	- The 1 <sup>o</sup> and 2 <sup>o</sup> quadrant are symmetric? - The tooth midline is deviated or coincident with the facial midline? - The tooth axes are normal or abnormal? - The contact points are normal or abnormal?
Are your teeth crooked?	- The tooth connectors are normal or abnormal? - The incisal embrasures are normal or abnormal? - The 1 <sup>o</sup> and 2 <sup>o</sup> quadrant are symmetric? - The tooth midline is deviated or coincident with the facial midline? - The tooth axes are normal or abnormal? - The contact points are normal or abnormal? - The tooth connectors are normal or abnormal? - The incisal embrasures are normal or abnormal?
Do you like your smile?	- The shape of the upper CI is squared, ovoid or triangular? - The upper CI dominance is present or absent? - The anterior tooth proportionality (CI, LI and Canine) is proportional or abnormal?
Do you have a beautiful smile?	- The shape of the upper CI is squared, ovoid or triangular? - Is the smile aesthetically pleasing?
Would you be satisfied in changing your smile?	- The upper CI dominance is present or absent? - The anterior tooth proportionality (CI, LI and Canine) is proportional or abnormal?

### Results

**Patients:** satisfaction with tooth shade (60%), with smile (80%), presence of a beautiful smile (83%); Interest in changing smile aesthetics (42.9%). **Students:** square/ovoid (40.8%) tooth shape, normal tooth shade (53%), average tooth length (61.7%), upper CI dominance (66.2%), tooth midline without deviation (55%), normal tooth axes (52.2%), tooth proportionality (51%), tooth asymmetry (54%); only 36.4% of smiles were considered aesthetic. Patients versus student's compliance ratio ( $p<0.001$ ) in all evaluated criteria, except regarding the tooth midline parameter (Tables 2, 3, 4, 5, 6). More studies should be applied to different populations and rehabilitation fields.

**Table 2** – Comparison of the satisfaction of the patients regarding tooth shade with the evaluation of tooth shade by DS.

DS Tooth Shade	Patients Satisfaction with Tooth Shade				p
	Unsatisfied		Satisfied		
	n	%	n	%	
Normal	240	33.9%	468	66.1%	< 0.001
Altered	291	46.9%	329	53.1%	
Total	531	40.0%	797	60.0%	

**Table 3** – Comparison of the assessment of tooth size by patients with the evaluation of the tooth length by DS.

DS Tooth Length	Patients Small Tooth				Patients Long Tooth			
	No		Yes		No		Yes	
	n	%	n	%	n	%	n	%
Normal	740	90.2%	80	9.8%	733	89.4%	87	10.6%
Increased	427	96.8%	14	3.2%	269	61.0%	172	39.0%
Decreased	46	69.7%	20	30.3%	60	90.9%	6	9.1%
Total	1213	91.4%	114	8.6%	1062	80.0%	265	20.0%
	$p < 0.001$				$p < 0.001$			

**Table 4** – Comparison of the opinion of patients regarding "crooked teeth" in relation to some aesthetic criteria evaluated by DS.

DS Criteria	Patients Crooked Teeth		p
	No	Yes	
<b>Tooth Symmetry</b>			
Absent	416	298	<0.001
	47.6%	65.4%	
Present	458	158	
	52.4%	34.6%	
<b>Tooth Midline</b>			
Coincident with Facial Midline	498	235	0.052
	57.1%	51.5%	
Deviation of Dental Midline	374	221	
	42.9%	48.5%	
<b>Tooth Axes</b>			
Normal	540	154	<0.001
	61.8%	33.8%	
Abnormal	334	302	
	38.2%	66.2%	
<b>Tooth Contact Points</b>			
Normal	406	108	<0.001
	46.5%	23.7%	
Abnormal	468	348	
	53.5%	76.3%	
<b>Tooth Connectors</b>			
Normal	382	99	<0.001
	43.7%	21.7%	
Abnormal	492	357	
	56.3%	78.3%	
<b>Incisal Embrasures</b>			
Normal	349	102	<0.001
	39.9%	22.4%	
Abnormal	525	354	
	60.1%	77.6%	

**Table 5** – Comparison of patients satisfaction with their smile in relation to some aesthetic criteria evaluated by DS.

DS Criteria	Patients Satisfaction with Smile		p
	No	Yes	
<b>Tooth Shape</b>			
Squared	84	459	<0.001
	31.6%	43.1%	
Ovoid	109	434	
	41.0%	40.8%	
Triangular	73	171	
	27.4%	16.1%	
<b>Upper CI Dominance</b>			
Absent	125	325	<0.001
	47.0%	30.5%	
Present	141	739	
	53.0%	69.5%	
<b>Tooth Proportionality</b>			
Normal	88	590	<0.001
	33.1%	55.5%	
Abnormal	178	474	
	66.9%	44.5%	

**Table 6** – Comparison of patients' interest in changing their smile in relation to aesthetic criteria evaluated by DS.

DS Criteria	Patients' Change Smile		p
	No	Yes	
<b>Upper CI Dominance</b>			
Absent	222	228	<0.001
	29.2%	40.0%	
Present	538	342	
	70.8%	60.0%	
<b>Tooth Proportionality</b>			
Normal	434	244	<0.001
	57.1%	42.8%	
Abnormal	326	326	
	42.9%	57.2%	

### Conclusions

Most patients showed satisfaction with their tooth architecture and smile aesthetics; patients perceptions versus students were in agreement on almost all tooth macro/micro-aesthetic parameters evaluated.

### Clinical Implications

Tooth architecture and smile aspect analysis is a communication tool for professional / scientific criteria and patients expectations in planning cosmetic/aesthetic changes.

**Keywords** Tooth architecture, aesthetic smile, tooth shade, shape, texture and position.

**References** <sup>(1)</sup> Samorodnitsky-Naveh, G. et al. (2007). Patients' satisfaction with dental esthetics. *JADA*, 138(6): 805-808. <sup>(2)</sup> Fradeani, M. e Barducci, G. (2004). Esthetic Rehabilitation in Fixed Prosthodontics – Volume 1: Esthetic Analysis. Chicago, Quintessence.

