



**OBJECTIVE:** Assessment of esthetic effectiveness of four optical illusion techniques when intervening only in one composite resin veneer with the goal of diastema closure between upper central incisors.

**MATERIALS AND METHODS:** Acrylic model with six natural upper anterior teeth and with a 2 mm diastema between central incisors was fabricated (Fig.1). Left central incisor was movable and prepared for veneer. The first two illusion techniques reproduced were exterior interventions and were produced by finishing. The last two techniques were interior interventions and were produced by application of a gray tint over the first nanohybrid layer which was covered by the last microfill layer of the system (Fig.2).<sup>1,2</sup> Every veneer was removed after fabrication and the next one was constructed over the same preparation.

Composite resin veneers were constructed and the following cases were derived: V0: no veneer (Fig.2), V1: veneer without optical illusion (Fig.3), V2: veneer with centralized interproximal ridges (Fig.4), V3: veneer with curved incisal edges (Fig.5), V4: veneer with gray pigment mesially/distally (Fig.6), V5: veneer with gray pigment on developmental lobes (Fig.7)

Each derived cast was photographed (Nikon D3200, AF-S MICRO NIKKOR 105mm and R1C1 Speedlight flash system) under the same environmental lighting conditions with a standard model-camera distance (30cm) and by the same operator. Digital printed photos of the models (large:13,2x17,8cm, small:6,1x8cm), with (low, medium, high) and without smile line (processed by Adobe Photoshop CS6) were shown to three groups of persons (n=25) (specialists, senior dental students and patients) in standardized viewing conditions in order to assess the overall size and the width of the left central incisor. Results were analyzed by Pearson's and goodness-of-fit  $\chi^2$  tests, Stuart-Maxwell marginal homogeneity test and logistic regression models for clustered data. Bonferroni corrected p-values are reported where appropriate.

**RESULTS:** Descriptive characteristics of the sample are seen in Table 1. There was no significant influence in considering the two central incisors as same size according to the technique (p=0.869) and group of evaluators (p=0.209)(Table 2). The estimated probability of assessing the tested incisor as wider was indicatively lower in V2 compared to V1 (adjusted Odds Ratio=0.59; p=0.088)(Table 3). Statistically significant differences were detected concerning the evaluation row (all p-values  $\leq 0,010$ ) regardless the size of photos. The height of the smile line affected the evaluation of the veneers only in the large sized photographs.

**CONCLUSIONS:** No interference is the best esthetic decision considering a 2 mm diastema closure between two central incisors if the plan is to interfere in only one of them with a laminate veneer. The next best option is to deliver a veneer with centralized interproximal ridges. Technique, level of dental expertise of the evaluator and gender of the evaluator does not affect veneer selection. Smile line affects veneer selection only in large sized photos.

**CLINICAL SIGNIFICANCE:** It is very important to have established clinical guidelines on the best way to close a 2mm diastema between the central incisors intervening on only one of them.

References: 1. Goldstein R. Esthetics in Dentistry. Sec. ed. Vol. 1. Principles, communications, treatment methods. London: Decker B.C. 1998;133-181. 2. Fradeani M. Esthetic Rehabilitation in fixed prosthodontics. Chicago: Quintessence 2004;1:148-151.

	Faculty members	Senior undergraduate students	Patients	Total	p-value
	N (%)	N (%)	N (%)	N (%)	
<b>Gender</b>					0.222
Men	14 (56.0)	12 (48.0)	8 (32.0)	34 (45.3)	
Women	11 (44.0)	13 (52.0)	17 (68.0)	41 (54.7)	
<b>Education</b>					<0.001
Primary	0 (0.0)	0 (0.0)	1 (4.0)	1 (1.3)	
Secondary	0 (0.0)	0 (0.0)	8 (32.0)	8 (10.7)	
Technical/College	0 (0.0)	0 (0.0)	7 (28.0)	7 (9.3)	
University	25 (100.0)	25 (100.0)	9 (36.0)	59 (78.7)	

Table 1. Descriptive characteristics of the observers (N=75).

Factor	Odds Ratio	95% C.I.	p-value
<b>Technique</b>			<b>0.869</b>
V1 *	1		
V2	1.51	(0.63, 3.58)	0.353
V3	1.16	(0.42, 3.19)	0.770
V4	1.16	(0.42, 3.23)	0.772
V5	1.00	(0.35, 2.83)	1.000
<b>Observers group</b>			<b>0.209</b>
Faculty members*	1		
Senior undergraduate students	2.52	(0.71, 8.95)	0.154
Patients	3.05	(0.87, 10.68)	0.081
<b>Gender</b>			<b>0.647</b>
Male*	1		
Female	1.24	(0.50, 3.09)	0.647

Table 2. Results from a multivariable logistic regression model for the probability of estimating the left central incisor as equally sized.

Factor	Odds Ratio	95% C.I.	p-value
<b>Technique</b>			<b>0.250</b>
V1*	1		
V2	0.59	(0.33, 1.08)	0.088
V3	0.70	(0.35, 1.39)	0.307
V4	0.70	(0.35, 1.39)	0.308
V5	1.00	(0.50, 2.01)	>0.999
<b>Observers group</b>			<b>0.007</b>
Faculty members*	1		
Senior students	0.83	(0.26, 2.62)	0.750
Patients	0.24	(0.08, 0.67)	0.007
<b>Gender</b>			<b>0.971</b>
Male*	1		
Female	1.02	(0.44, 2.37)	0.971

Table 3. Results from a multivariable logistic regression model for the probability of estimating the left central incisor as wider.



Fig. 1. Initial model



Fig. 3. Veneer without illusion



Fig. 4. Veneer with centralized interproximal ridges



Fig. 5. Veneer with curved incisal edges



Fig. 6. Veneer with gray pigment mesially/distally



Fig. 7. Veneer with gray pigment on developmental lobes

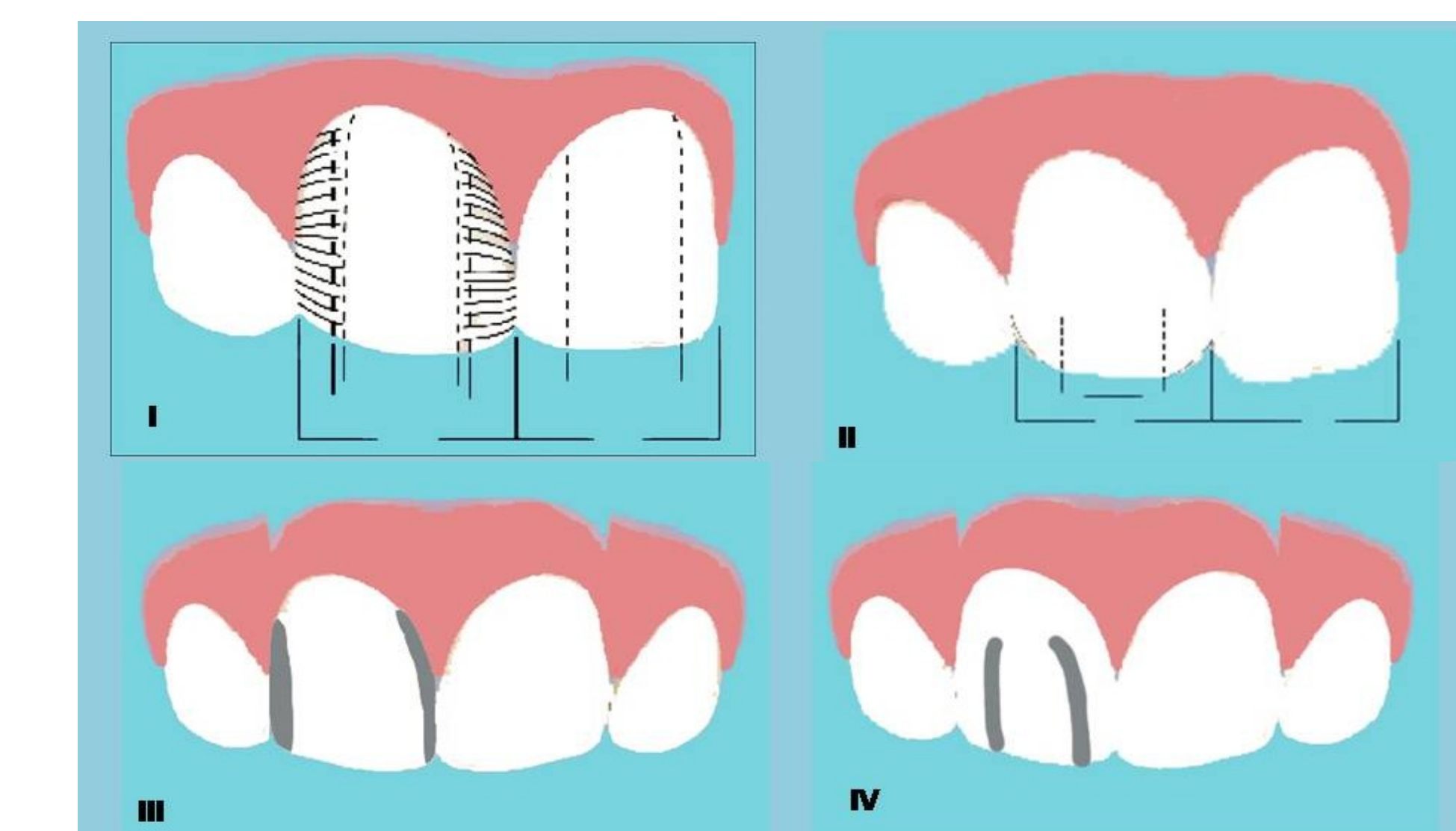


Fig. 2. Schematic view of the illusion applied and tested in the present study. I. Centralizing interproximal ridges (V2). II. Curving incisal edges (V3). III. Applying gray pigment mesially/distally (V4). IV. Applying gray pigment on developmental lobes (V5).



Fig. 8. All cases with low smile line



Fig. 8. All cases with medium smile line

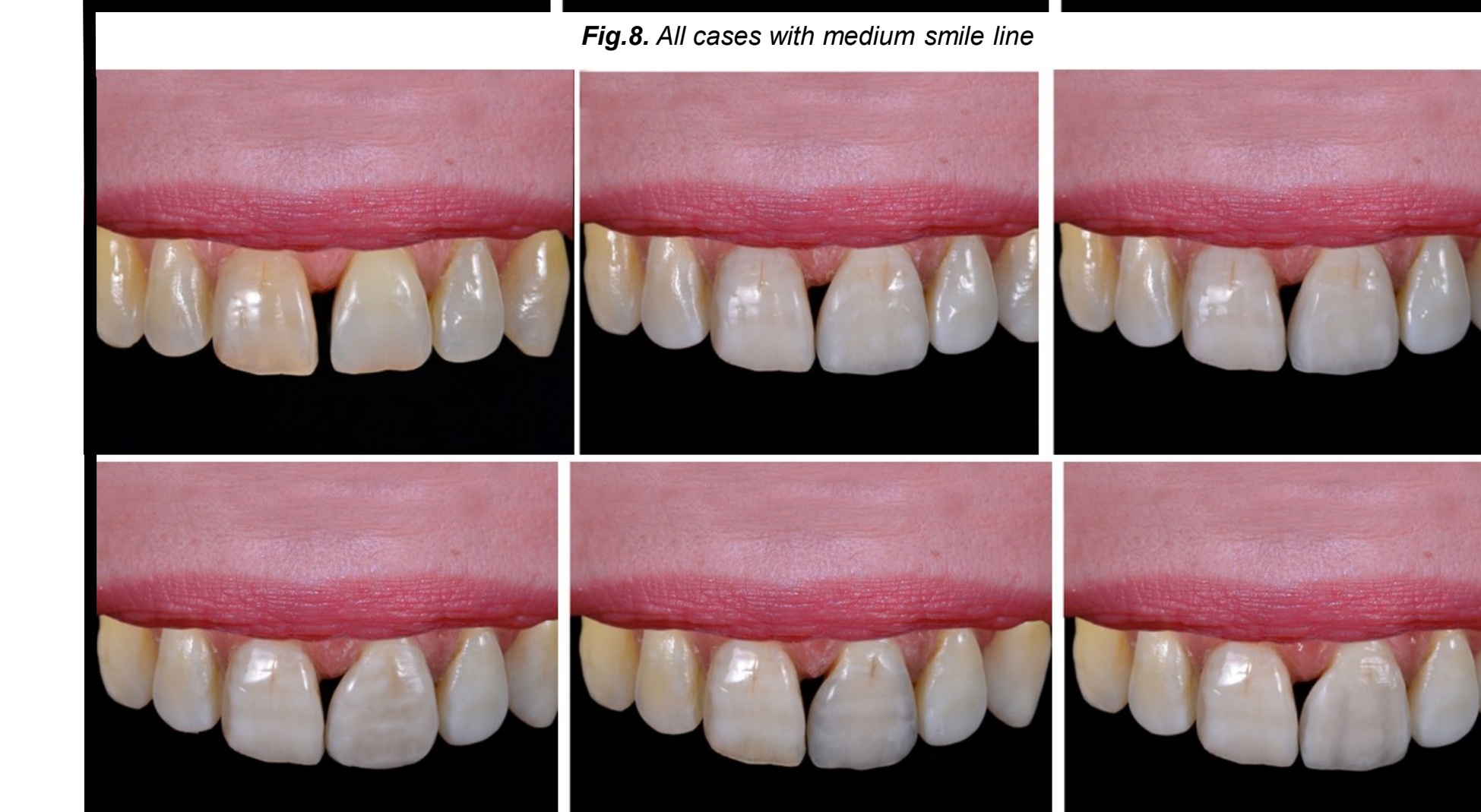


Fig. 8. All cases with high smile line