Perception of dentofacial esthetics

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PhD thesis summary

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Introduction

Physical appearance affects social appreciation. The perception of this physical appearance is heavily influenced by dentofacial esthetics. This crucial role in self-perception and social judgement is well documented. Esthetically pleasing children and adults are judged more positively. Studies show that people with esthetic smiles are judged by other individuals to have better intellectual and social capacities. Men and women have been shown to have similar preferences. Individuals with an esthetics smile are considered to be more attractive by the other sex as well. Physical appearance and the perception of esthetic abnormalities have an influence on the individual's self-esteem too. Facial esthetics show a correlation with confidence and openness as well.

A lot of patients seek medical and dental professional help because of the patterns dictated by society and media. Esthetics gain more and more ground in dentistry, with patient expectations rising

significantly. There is a tendency towards prioritizing esthetics over functionality. These expectations are mostly unrealistic. The dentist should only seek to satisfy these expectations to the point where functional rehabilitation is not compromised. Several treatment options should be presented, and the dental professional should be able to establish an aim that is acceptable for both parties. This relies on the professional's sound knowledge concerning his/her own esthetic preferences and capabilities. Bui et al. have shown that dentist, orthodontist specialists and laypersons all consider dental abnormalities to be more significant than other facial abnormalities. All groups prefer normal facial profiles. Upper lip protrusions are preferred over lower lip protrusions. Sex plays no role in these preferences. The dental professionals' preferences are supposedly based on not only their personal ones, but their knowledge and professional experiences too. It has been shown that dentist tend to judge even little deviations from

normal occlusion as significant. While general dentists concentrate on dental abnormalities, orthodontist put an emphasis on positional ones. There are several studies in the literature that observed the esthetic judgement of professionals and laypersons; however, the number of studies that include self-perception is low. Moreover, there are very limited data concerning dental students. This topic is of importance because a student can be considered an intermediary subject. It is also important to note that esthetics gain more and more ground in the dental curriculum; thus, investigating the dentofacial preferences of dental students can throw light upon the role of education in its development.

Aims

The aim of the present questionnaire- and photo-evaluation based, cross-sectional study was to describe the dynamic changes of dentofacial esthetics throughout dental school. The correlation between school grade, esthetic self-perception, perception of certain profile, miniesthetic and microesthetic features, and sex was studied. The null hypotheses were the following:

- grade does not have a significant effect on students' esthetic self-perception,
- sex does not have a significant effect on students' esthetic self-perception,
- grade does not have a significant effect on students' esthetic preferences,
- sex does not have a significant effect on students' esthetic preferences,
- self-perception does not have a significant effect on esthetic preferences.

Materials and methods

Subjects and sampling

All five Hungarian-speaking grades of all the four Hungarian dental schools were involved. A questionnaire was handed out and was accompanied by a photo series containing smile and profile photos. Completion was voluntary and was performed anonymously. The study was conducted between October 2018 and August 2019. Study protocol and the instruments applied were approved beforehand by the Regional Ethics Committee for Research in Human Medical Biology at the University of Szeged (No. 178/2018-SZTE). Written informed consent was not required. The study was approved by the deans of the four faculties as well.

Questionnaire

The authors proposed that combining the elements of the existing questionnaires might be the optimal solution for this study. This instrument was named

Dentofacial Esthetics Instrument for Dental Students. It was developed for the Hungarian language; however, there is an authentic English translation available that is still to be tested. The questionnaire was aimed at describing esthetic self-perception, whereas the photo series evaluation was aimed at studying subjective esthetics preferences.

Photo series

The photo series used in the study were prepared and edited by the authors. The model was chosen according to literature data: a Caucasian woman of Hungarian origin with a clinically normal smile, normal occlusion, normal cephalometric data, without any clinical abnormalities affecting her facial profile.

The smile image was obtained from a standard frontal view with visible incisors and canines, soft tissues (gingiva), and lips. The image was cropped,

removing the chin, the nose, and the cheeks, in order to rule out any interfering macroesthetic factors.

The profile phot was obtained from a standard lateral view, showing the lower and middle thirds of the face, including the nose, incisors and canine, the lips, and the chin. The upper border was defined by the infraorbital rim.

The photos were taken from a distance of 1.5 m using a Nikon D700 (Nikon Corporation, Tokyo, Japan) camera and a Nikon 105 mm F 2.8G VR AF-S ED.IF Nikkor objective (Nikon Corporation, Tokyo, Japan). The model was instructed to obtain a standing position with a natural head posture, looking forward. The photos were taken at noon, on a sunny day, in a room well lit by natural light.

Photo modifications were performed to affect the esthetically most relevant smile and profile elements. The original photo plus four modifications were used

in case of every esthetic feature; thus, all series contained five images.

Statistical analysis

Statistical analysis was carried out by an independent evaluator. The analysis was blind: the evaluator received coded results and was told what analyses to carry out using what coding, without knowledge of the meaning of the codes.

The results were analyzed in SPSS 22.0 (IBM Corp., Armonk, NY, USA). Continuous variables were characterized by means with standard deviations and medians. Categorical variables were described with the number of observed cases and frequencies expressed in percentages. For hypothesis testing, linear regression analysis, the chi-square test and the Kruskal-Wallis test were used, as appropriate. For the analyses, the multiple-choice items were treated as categorical variables and the Likert-type responses

were treated as continuous variables (as they express degree rather than discrete options).

To test the contribution of students' gender, grade, and institution to the variability of their preferences, a multinomial regression model was built, in which students' preferences were entered as the dependent variable, and the said predictors were entered as factors. The reference grade was always Grade 1, and the reference image was always the unmodified image. This analysis was performed for each of the ten and six photo series. The null hypothesis was that none of the factors had significant contribution to the variability of student preferences. The level of significance was $p = 0.05$, unless otherwise indicated.

Results

Mini- and microsthetic perception

The response rate was 93.7% (861 students). The self-perception of the respondents was highly favorable, regardless of grade or gender. Grade and heteroperception were significantly associated regarding maxillary midline shift ($p < 0.01$) and the relative visibility of the arches behind the lips ($p < 0.01$). Detailed analysis showed a characteristic pattern of preference changes across grades for both esthetic aspects. The third year of studies appeared to be a dividing line in both cases, after which a real preference order was established. Association between autoperception and heteroperception could not be verified for statistical reasons.

Profile preferences

Gender and dental school were not associated with the observed preferences, but the grade of studies was associated for three of the modified parameters: chin

prominence, the sagittal position of the maxillary dental arch, and the simultaneous modification of the prominence of the chin and the nose.

Discussion and conclusions

Our findings corroborate the results of most previous studies regarding the effect of dental education on the dentofacial esthetic perception of students. We have shown that the effect can be demonstrated on the grade level, which we attribute to the specific curricular contents. We found no gender effect, which, in the light of the literature, suggests that the gender effect in dentofacial esthetic perception is highly culture dependent. The results allow no conclusion regarding the relation between autoperception and heteroperception.

We have demonstrated that the anteroposterior position of the maxillary incisors may be an important determinant of profile esthetics, even if this position does not influence the situation of the soft tissues and if the forehead cannot be used as a reference. We have also shown that the harmony between the nose and the chin overrides the importance of their individual dimensions.

Publications providing the basis of the thesis

I.   **Dentofacial mini- and microesthetics as perceived by dental students: A cross-sectional multi-site study**

Romsics L, Segatto A, Boa K, Becsei R, Rózsa N, Szántó I, Nemes J, Segatto E

PLoS One. 2020 Mar 12;15(3):e0230182.

https://doi.org/10.1371/journal.pone.0230182

II.   **Patterns of Facial Profile Preference in a Large Sample of Dental Students: A Cross-Sectional Study**

Romsics L, Segatto A, Boa K, Becsei R, Rózsa N, Párkányi L, Pinke I, Piffkó J, Segatto E

International Journal of Environmental Research and Public Health. 2021 Aug 13;18(16):8554.

https://doi.org/10.3390/ijerph18168554