Int. J. Oral Maxillofac. Surg. 2017; xxx: xxx–xxx
http://dx.doi.org/10.1016/j.ijom.2017.07.024, available online at http://www.sciencedirect.com

International Journal of Oral & Maxillofacial Surgery

Clinical Paper
Orthognathic Surgery

Satisfaction with facial profile aesthetics: are norms overrated?☆

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I. Manevska, A. Pavlic, V. Katic, M. Trinajstic Zrinski, M. Drevensek, S. Spalj: Satisfaction with facial profile aesthetics: are norms overrated?. Int. J. Oral Maxillofac. Surg. 2017; xxx: xxx–xxx.

Abstract. This study aimed to explore to what extent adults perceive deviations from the norm of a balanced profile with normal occlusion as reducing satisfaction with facial appearance and having a psychosocial impact. This cross-sectional study included 225 Caucasian subjects (64% women) aged 18–42 years. Their facial profiles were analyzed photogrammetrically and they were classified into three categories: within, below, or above the standard range for the Croatian population with a normal occlusion. Psychosocial issues were assessed by self-reported satisfaction with facial appearance and domains from the Orthognathic Quality of Life Questionnaire: social aspects of dentofacial aesthetics (SA), facial aesthetics concern (FA), and awareness of dentofacial aesthetics (AW). Men with a concave profile were less satisfied with their faces than those with a flat or convex profile ($P < 0.05$). A reduced upper lip height in men resulted in a lower level of satisfaction and increased FA score, when compared to men with a normal or increased upper lip height ($P < 0.05$). In women, a reduced middle third of the face increased AW ($P = 0.045$). Deviations from a well-balanced facial profile, as well as the morphology of the nose and lip, do not increase psychosocial issues to a great extent. The range of acceptable facial characteristics is evidently much broader than the norms.

Key words: aesthetics; face; satisfaction; perception.

Accepted for publication

Current diagnostic trends in maxillofacial surgery and orthodontics still consider skeletal and occlusal relationships determined by cephalometric analysis and plaster casts, placing emphasis on soft tissue relationships and facial aesthetics[1]. The soft tissue paradigm recognizes the influence of facial aesthetics on patient quality of life (QoL), and places functional and aesthetic considerations in an appropriate mutual relationship[2].

The specific concept of QoL associated with oral health is defined as the level of health of the oral and related tissues that enables an individual to eat, speak, and socialize without active disease, discomfort, or embarrassment, or as the absence of negative influences of the oral condition on the individual's social life and a positive sense of dentofacial confidence[3].

The appearance of the teeth and smile are critical components of facial attrac-

☆ Preliminary data were reported as an oral presentation at the Third Congress of the Macedonian Orthodontic Society in Ohrid, Macedonia, 2016.

0901-5027/000001+07

tiveness. Alterations that are proximal to the dental region and cause distortion of the balanced facial form close to the communicative zones are more likely to result in changes in self-esteem[2]. This appears not to be the case for alterations that are more distant from the mouth and have less impact on the soft tissue facial contours. Self-perceived facial form disproportion, e.g., malocclusion, may produce anxieties with resultant changes in self-esteem[4].

However, is there evidence of agreement between human beings as to what constitutes facial attractiveness? What makes a face attractive? Is beauty altogether in the eye of the beholder? Historically, questions on facial beauty and attractiveness were first raised during the time of the ancient Egyptians and Greeks, who standardized proportions for human sculptures – the original canons of proportions – representing a harmonious human form[5]. Some of the factors influencing this complex issue are common concepts at a particular period in time or for a particular culture.

Many studies have evaluated the profile standards and perception of attractiveness of Caucasians, Africans, and Asians[6–9]. In modern society, aesthetic criteria appear to have been defined in almost all cultures[10,11], but several findings suggest that the perception of beauty may be innate, universal, or cross-cultural[12,13]. Langlois et al. proposed that 'averageness' is attractive, i.e. a face is perceived as attractive when its facial gestalt is close to the average or mean of a population of faces[13].

This study aimed to explore to what extent Caucasian adults perceive deviations from the norm of an average, balanced facial profile with normal occlusion as reducing satisfaction with facial appearance and having a disruptive psychosocial influence.

The hypothesis of this study was that deviation from the reference values for a balanced profile will induce dissatisfaction with facial aesthetics, most notably in social parameters and the least in dentofacial awareness. Furthermore, it was hypothesized that the psychosocial impact is likely to be more evident in sagittal than vertical deviations and that aesthetic concerns and the social aspects will be increased more in subjects with concave profiles and females with retruded lips.

Materials and methods

This cross-sectional study included a sample of 225 Caucasian subjects (64% women) aged 18–42 years (median 21, interquartile range 19–23 years). The subjects were employees and students of the University of Rijeka, who were fully dentate up to and including the first permanent molar. Subjects with learning difficulties or craniofacial syndromes, including those with surgically repaired clefts, were excluded.

Profile facial photographs were taken in the standing natural head position, with a hanging gauge (scale 0.5 mm) positioned in line with the tip of the nose, representing the true vertical. Photogrammetry included the analysis of 17 variables defining craniofacial profile characteristics. All analyses were performed using the software AudaxCeph (AudaxCeph, Ljubljana, Slovenia). Reference values for a normal occlusion and balanced profile for the Croatian ethnicity were used, as defined in previously published studies[9,14,15] (Table 1).

The sample size was calculated with the presumption that the differences in dimensions of self-perceived aesthetic impairment between those with significant and non-significant deviations from the norms of a balanced profile and normal occlusion would not be great. These will amount to two scalar points with high dispersal of data, i.e. standard deviation of five scalar points in both groups. At a power of 80% and significance level 0.05, and with the presumption of equal group sizes, the calculated minimum sample size was 198 subjects. If the standard deviation was expected to be lower for one gender (3) minimal sample, then the required sample size would be 72 for each gender. These calculations were performed using the statistical software MedCalc 14.8.1 (MedCalc Software bvba, Ostend, Belgium), and based on previously published data[16].

For the purpose of statistical analysis, the response variables were grouped into three categories: (1) within the norm for the Croatian population with normal occlusion, (2) deviation below the norm, and (3) deviation above the norm. Typical male and female participants with a normal occlusion and well-balanced facial profile are shown in Fig. 1, and those with a profile deviating from the norm are shown in Fig. 2.

A self-administrated questionnaire was completed, which included the demographic variables age and gender and self-reported satisfaction with facial appearance assessed on a Likert-type scale ranging from 0 = not at all to 4 = very much. Three domains of the Orthognathic Quality of Life Questionnaire (OQLQ) were also assessed: social aspects of dentofacial aesthetics (SA), facial aesthetics concern (FA), and awareness of dentofacial aesthetics (AW)[16]. The reliability of the Croatian translation of the OQLQ has been reported previously[17].

Analysis of variance (ANOVA) and the Student–Newman–Keuls post-hoc test were used for the comparison of self-reported satisfaction with facial appearance and the impact on psychosocial issues between those with a normal occlusion profile and those with a deviation

Table 1. Variables used in the study.

Face profile photogrammetric variable		Measurement	Male	Female
Sagittal face and nose				
1	Face convexity angle	G–Prn–Pg	142 ± 4.5	142 ± 4.5
2	Facial angle without the nose	G–Sn–Pg	168.8 ± 5.0	169.1 ± 4.7
3	Total facial angle with the nose	N–Prn–Pg	130.5 ± 3.7	130.2 ± 3.5
4	Nasofrontal angle	G–N–Nd	136.4 ± 6.7	139.1 ± 6.4
7	Tip of the nose angle	N–Prn/Sn–Cm	79.9 ± 6.4	84.1 ± 5.2
8	Nasomental angle	N–Prn/N–Pg	29.5 ± 2.5	30.4 ± 2.4
Lips				
5	Projection of the upper lip to the chin	N–Pg/N–Ls	7.0 ± 2.3	7.2 ± 1.7
6	Projection of the lower lip to the chin	N–Pg/N–Li	3.3 ± 1.8	3.7 ± 1.4
9	Nasolabial angle	Cm–Sn–Ls	105.4 ± 9.5	109.4 ± 7.8
10	Mentolabial angle	Li–Sm–Pg	129.3 ± 9.6	134.5 ± 9.1
11	Upper lip angle	Sn–Ls/Sn–Pg	11.7 ± 6.2	12.9 ± 4.8
12	Upper lip to the Ricketts line	Ls–E	−6.9 ± 2.2	−6.4 ± 1.8
13	Lower lip to Ricketts line	Li–E	−4.2 ± 2.8	−2.9 ± 1.9
14	Upper lip to Burstone line	Ls–Sn–Pg	3.0 ± 1.6	2.6 ± 1.1
15	Lower lip to Burstone line	Li–Sn–Pg	1.9 ± 2.1	2.1 ± 1.6
Vertical face				
16	Upper lip/lower third of the face	Sn–Sto/Sn–M × 100	33.0 ± 2.4	32.4 ± 2.3
17	Middle third of the face	G–Sn	67.9 ± 4.4	64.7 ± 3.4
18	Lower third of the face	Sn–M	71.2 ± 4.7	63.5 ± 3.4

Cm, columella; E, aesthetic line; G, glabella; Li, labiale inferius; Ls, labiale superius; M, menton; N, nasion; Nd, nasal dorsum; Pg, pogonion; Prn, pronasale; Sm, supramentale; Sn, subnasale; Sto, stomion.

Please cite this article in press as: Manevska I, et al. Satisfaction with facial profile aesthetics: are norms overrated?, *Int J Oral Maxillofac Surg* (2017), http://dx.doi.org/10.1016/j.ijom.2017.07.024