

Aesthetic Perception of Student of the Faculty of Dentistry, University of Prof. Dr. Moestopo on Concave Face Profile

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Abstract

Background: One of the reasons patients undergo orthodontic treatment is not satisfied with their appearance and profile. This is especially felt by patients with class III malocclusion, where the patient's facial profile is generally concave because the lower jaw is more prominent than the upper jaw. In orthodontic treatment, correction of this concave face profile is indeed not easy and often to get good results requires collaboration with surgery. Today, orthodontic treatment is more associated with aesthetic correction of the patient's face and smile. As is known, the perception of each individual on facial profiles varies depending on education, experience and views or aesthetic values that are adopted. This, in particular, can affect an orthodontic treatment plan which is certainly arranged according to patient expectations.

Objective: To find out the aesthetic perceptions of the students of the faculty of dentistry Prof. Dr. Moestopo University on concave facial profiles

Materials and Methods: A total of 67 students aged 17 - 30 years consisting of 35 academic program students and 32 professional program students at the faculty of dentistry Prof. Dr. Moestopo University participated in this study by signing an informed consent. All participants were asked to provide their aesthetic perceptions of the six variations of concave facial profiles on a visual analogue scale along with their reasons.

Results: Status of student education programs proved to influence aesthetic perception ($p < 0.05$), while gender did not.

Conclusion: The aesthetic perception of the students of the faculty of dentistry Prof. DR. Moestopo University towards concave facial profiles is expressed by the profile angle of 186° . The tolerance of aesthetic perceptions to concave facial profiles is inversely proportional to the angle of profile of the face.

Keywords: *Aesthetic Perception; Class III Malocclusion; Concave Facial Profile*

Introduction

Modern society places a very strong emphasis on one's physical appearance, because it can affect their lives in various ways [1,2]. Research shows that the face is an indicator of attraction that is slightly stronger than the body as a whole. Not a few think that attractive appearance is in harmony with quality of personality such as being more friendly, intelligent and more social in a more positive way [2].

A malocclusion with malposition of the dentition is believed to have a significant impact on the quality of individual attractiveness, esthetics and life. In this case, the interference caused can affect social interaction, interpersonal relationships, mental conditions and can cause feelings of inferiority [2].

Nowadays, a great deal of attention is directed to dentistry, especially orthodontics, which is more associated with facial esthetic correction or appearance. In this case, changes can be made through correction of the ideal dental arch shape, charming smile and ideal facial profile. Facial profile analysis is important to assess the harmony of the patient's face and in terms of individual well-being, orthodontic treatment can be accompanied by surgical procedures [1,4]. One important factor that influences the attractiveness of an individual's facial profile is the position of the mandible. According to Naini., *et al.* (2011) the mandible is one of the facial characteristics that people tend to often be associated with individual personality.

In term of malocclusion, class I malocclusion is associated with a straight profile, while class II malocclusion is associated with convex facial profiles, so Class III malocclusion is associated with concave facial profiles and this can be caused by a retrusive maxillary position, or protrusive mandible or both [4-6]. Generally, both practitioners and lay people assume that the face profile of class I is more interesting than the face profile of class II and class III [7]. However, Ioi H., *et al.* (2007) found that Japanese people tended to choose class II face profiles rather than class III face profiles for both men and women [8]. Johnston., *et al.* (2010) reported that patients with class III malocclusion were more concerned and aware of their profile. Asian perspectives on convex facial profiles due to retrognathia of the mandible, are still acceptable socially and aesthetically, while the same profile is considered less or unattractive by white people than concave facial profiles [4]. Despite this view, it is recognized that no studies have been conducted to showing what kind of class III face profile is considered to be quite interesting or acceptable/tolerated by the Asian community. It's believed that the aesthetic perception of each individual is different and subjective, and influenced by various factors such as education, experience and angle of views adopted which may also be influenced by ethnicity and culture.

Moving on from this thought, this study was conducted with the aim to determine the aesthetic perceptions of the students of the faculty of dentistry Prof. Dr. Moestopo University on concave facial profiles. Hopefully, the results obtained can be of benefit to practitioners consideration while dealing with patients with concave facial profiles.

Materials and Methods

A total of 67 students participated in this study and they're all explained pertaining the purpose of the study and the importance of giving approval by signing the informed consent before entering the further stage in this study. Participants in this study consisted of 35 academic program students and 32 professional program students from the faculty dentistry Prof. Dr. Moestopo University. In this group of participants, there were 20 male students and 47 female students. To all participants in this study were given six concave face profile photographs of patients who were engineered in such a way that they had six variations in the profile angle. The difference in the profile angle among the six variations is $+ 2^\circ$, starting with the angle of 186° , because in the profile analysis, it is known that for the angles above 180° (Figure 1), the profile of the face is categorized as concave [9-11]. Thus, in this study, the angles of facial profiles in photographs were 186° (A), 188° (B), 190° (C), 192° (D), 194° (E) and 196° (F) (Figure 2). Participants are asked to give a score on each photograph and explain the reason. Assessment is done using a VAS (visual analog scale) which is a scale with a value of 0 - 10. A value of 0 indicates the most unattractive perception while a value of 10 indicates the most interesting perception in terms of aesthetic profiles. Assessment is done by marking exactly the selected number and not in the middle. If there is an incorrect sign in the number between 0 - 10, then this form is excluded from the study. Assessments must be done on their own without discussing with friends or other people so that participants are expected to be able to give an assessment based on their own perceptions without influence from others.

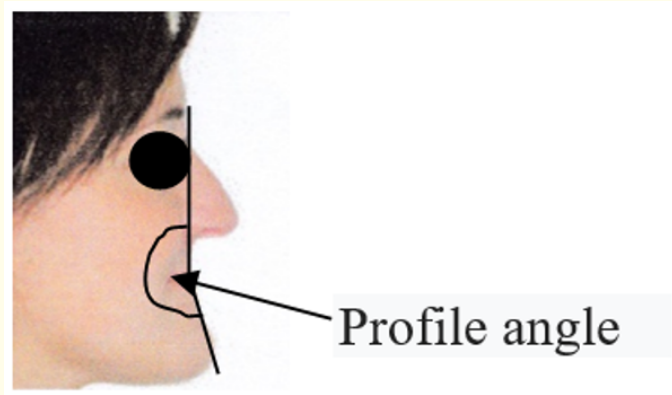


Figure 1: Analysis of facial profiles. The intersection of lines from glabella - upper lip and line of upper lip - soft tissue pogonion will form angles and on class III (concave) facial profiles the angle is more than 180° .

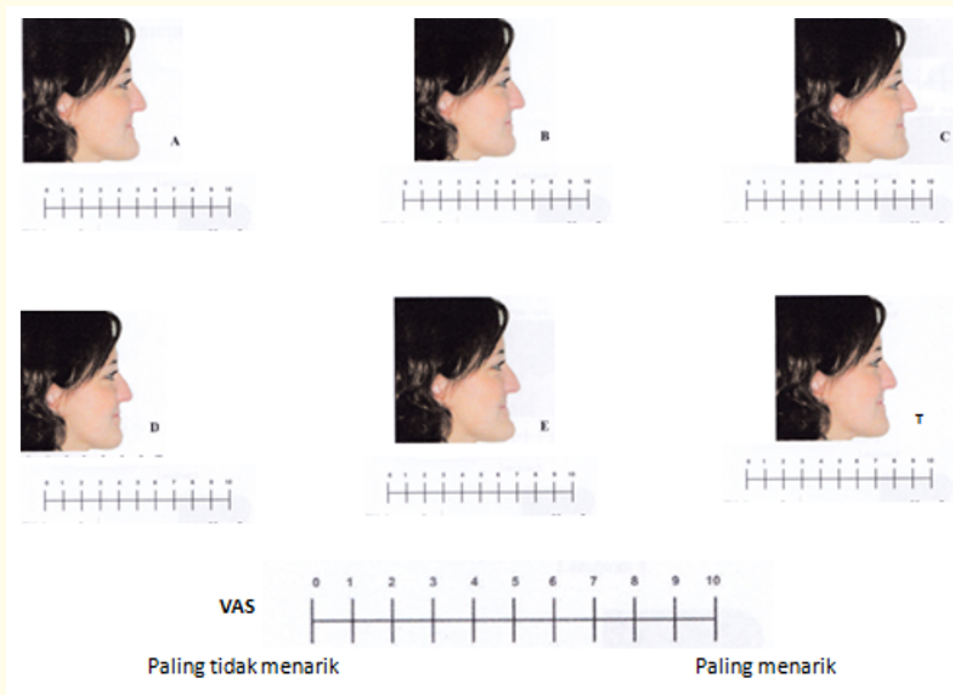


Figure 2: Sheet containing 6 photographic variations of concave facial profiles that must be assessed by participants with VAS (visual analog scale). VAS consists of a horizontal line containing numbers from 0 - 10. A value of 0 indicates the most uninteresting perception and the value of 10 shows the most interesting perceptions according to participants.

Results

The scores/scores obtained in this study are tabulated. Table 1 shows the average visual analog scale (vas) score for all variations in the concave facial profile angle shown to participants. Table 2 shows the average of vas score of participants based on the level of education, namely participants in the academic program and professional program at the faculty of dentistry Prof. Dr. Moestopo University. Table 3 shows the average vas score based on the sex of the participants.

In table 1, it can be seen that participants gave the highest score on the variation of the concave profile photograph D, where the angle magnitude is 186°. This angular variation in this study is the initial value of the six angle variations used. Thus, it is clear that the aesthetic perception of a concave facial profile that can still be tolerated by participants in this study is 186°. Basically a concave face profile with an angle of 186° on a photograph will look almost straight like the face profile of class I.

Angle variation	Mean	SD
A (194°)	3.36	1.178
B (188°)	5.55	2.141
C (192°)	3.97	1.466
D (186°)	6.25	1.803
E (196°)	2.34	1.754
F (190°)	4.10	1.955

Table 1: Mean of vas score for all variation of angle of concave profile.

In table 2, it can be seen that the concave face profile which is still quite esthetically perceived by the participants in this study is photographic D. This occurs both in groups with participants of academic programs and professional programs. Professional program students have access to patients in the clinic so that they are assumed to have understood better the facial profile picture. Meanwhile, academic program students rely solely on theoretical learning. However, both groups showed the same preference for aesthetic perceptions of concave facial profiles

Angle	variation Student of academic program		Student of professional program		p value
	Mean	SD	Mean	SD	
A (194°)	4.06	1.731	2.59	1.411	.001
B (188°)	6.69	1.604	4.31	1.974	.000
C (192°)	4.54	1.268	3.34	1.428	.001
D (186°)	6.71	1.619	5.75	1.883	.004
E (196°)	2.71	1.619	1.94	1.830	.015
F (190°)	4.63	1.101	3.53	1.626	.028

Table 2: Mean of VAS score based on education level.

In table 3, it looks that both male and female participants have the same preference for aesthetic perception of concave facial profiles. The preference of aesthetic perception on concave facial profiles even looks the same in other variations of profile angles. Thus, aesthetic perceptions of concave facial profiles can be said to be not influenced by gender.

Angle variation	Male		Female		p value
	Mean	SD	Mean	SD	
A (194°)	3.15	1.871	3.45	1.691	.606
B (188°)	5.10	2.425	5.74	2.005	.361
C (192°)	3.75	1.585	4.06	1.420	.573
D (186°)	6.20	1.765	6.28	1.838	.676
E (196°)	2.40	2.257	2.32	1.519	.686
F (190°)	4.00	2.127	4.15	1.899	.818

Table 3: Mean of VAS scores by sex.

Discussion

Perception is understood as the awareness of the organism of the objects and events around it caused by the stimulus received by the sense organs [12]. In this case, perception is a process to achieve awareness or understanding of the environment by regulating and interpreting sensory information. All perceptions involve signals in the nervous system which can be the result of physical stimulation of the sense organs. Our brain will organize and give meaning to limited information collected by sensory organs. Then, the brain will compile guesses and guesses based on experience with reference to the context, namely objects that stimulate sensory organs at that time. Therefore, perception is believed to be not just a process of detecting stimulus, but perceptual processes that depend on the way the brain organizes the stimulus to create meaning [12,13].

The face is the main factor that determines one's attractiveness and facial attractiveness is an important physical attribute because people tend to assess personality characteristics and one's social abilities through one's appearance/face. Cognitive processes have shown that perceptions of facial attractiveness display sexual dimorphism and cross-cultural similarities in choosing or determining facial characteristics that are categorized as interesting [3]. In this case, attractive individuals are considered to have higher social appeal, better interpersonal relationships and are more competent in the field of work. Attractive individuals often benefit from this halo effect even from childhood to adulthood and obtain more positive social ratings throughout their lives in various fields. On a more extreme level, there is a presumption that might not be realized, such as the perception that beautiful means good and bad means evil which can be interpreted as collective prejudice that might underlie one's judgment [13,14].

Outwardly, humans prefer attractive individuals. Through his research, Professor Langlois., *et al.* prove that children pay more attention to attractive-faced individuals than individuals with less attractive faces. Assessment of facial attractiveness is obtained in the early stages of childhood and as we aged, various factors influence which ultimately contribute to the formation of a perception [15]. In this case, these factors can be in the form of previous experience, expectations and psychological conditions which is able to create a perceptual order that involves readiness to receive stimulus in a certain way, ignores certain types of stimuli and becomes sensitive to other stimuli [12]. Context and contrast factors underlying a stimulus can dramatically change perceptions of a particular stimulus. The context that underlies the individual's perceptions can influence the way the individual evaluates others [16]. Aesthetic perceptions also cannot be separated from consideration of the context. In this connection, the prominence of aesthetic characteristics will help direct one's perceptions, because one's attention will quickly be fixed on structures that have real contrast characteristics compared to the stimulus around them. Other factors, such as culture can cause bias in the perception process and this is known as cultural relativism. Experts believe that the culture and beliefs adopted by the community are different and in the end this will produce different perceptions of someone or an object. Therefore, the beliefs and activities of each individual must be understood according to the individual culture itself.

Face Profile Preferences in the community show that ethnic factors have a strong influence on judging facial attractiveness. Through research, it is known that Mongoloids chose the characteristics of bimaxillary retrognathism or orthognathic facial profiles as attractive profiles, while for the Caucasoids, profiles that appealed to women were straight tend to convex with slightly protrusive lips, and for men, the attractive profile was convex with retrusive lips. In the Negroid group, the profile considered attractive is a class I profile with bimaxillary prognathism and competent lips [15].

Aesthetics is a branch of philosophy that discusses art and beauty and the human response to it and includes aspects of beauty, attraction and harmony. In this connection, the face is said to be harmonious when each part that forms it gives birth to an objective and positive feeling or appreciative impression. This increase in appreciative impression is in line with the level of perfection of the face shape. Perfection that is appreciated for a form, begins with a perception that judges the face as a single unit. Furthermore, the perception process develops into each of its components. In this context, it is harmonious to be able to produce a feeling of satisfaction because the object that is observed and perceived fulfills the rules relating to the individual concept. In other words, individuals perceive something as expected. Thought like this is not without foundation, because the level of appreciation of a person depends on the level of perception of the perfection of the shape of the object. Moving on from this thought, harmony is understood as the only concept that can provide an opportunity to formulate objective criteria that can generally be applied to assess face shapes that are categorized into normal limits. Based on this fact, the term harmonious is considered capable of defeating one's consideration of the term beauty and interesting in the process of establishing a diagnosis and preparing a treatment plan so that a professional and analytical approach to facial aesthetics is possible [14].

Having a harmonious and proportional face is the dream of every human being. According to Jefferson, there are universal standards for faces regardless of race, age, gender and other variables. This standard became known as divine proportion. Attractive faces must have ideal facial proportions and research by Ricketts has proven this in the analysis of lateral cephalometry, frontal and analysis of facial

photographs carried out based on the rules of the divine proportion to produce faces that are believed to be ideal [17]. Therefore, treatments that refer to standards of divine proportion is believed to maximize facial aesthetics. It is true, that attractive faces are influenced by cultural and ethnic factors but disproportionate faces can lead to psychosocial problems. Distortion and asymmetry are said to be the main contributors to facial aesthetic problems, so the main purpose of facial analysis is to detect disproportion [9].

Regarding facial analysis, it can be seen from two directions, namely frontal and lateral. Through the frontal view, we can assess, among other things, proportion, shape and facial symmetry. In proportion analysis, the face can be divided into three parts, namely the upper third of the trichion (hairline boundary) to the glabella, the middle third, namely from the glabella to the subnation and the lower third from the subnation to the menton. In this case, the face is said to be proportional when each of the upper third, middle and lower of the face is the same. In the lateral view, analysis is generally directed at the nose, lips and chin, because these three things are important in facial aesthetics. Small nose and chin can make lips more forward and vice versa the big nose and chin can make lips look retrusive. The facial profile is analyzed in this lateral view, namely at the angle formed by the intersection of lines drawn from glabella to the superior labialis with a line drawn from the superior labialis to the most anterior point of the soft tissue of the chin (pogonion). Variation of the resulting angle will result in three categories of face profiles namely straight profiles, if the intersections of the two lines form a straight line with a large angle of 180° , a convex profile, if the intersection of the two lines produces an angle less than 180° , because the chin is positioned more backward and concave profile, if the intersection of the two lines forms an angle greater than 180° because the chin is located more anteriorly.

In this study, the aesthetic perception of concave facial profiles was assessed using visual analog scale (VAS) in students of academic programs and professional programs at the Faculty of Dentistry, Prof. Dr. Moestopo University. VAS consists of a horizontal straight line of 100 mm or 10 cm, starting with numbers 0 to 10 in each horizontal line terminal. Each of these terminal line boundaries expresses the extreme value of the aesthetic perception that is to be measured. The value of zero (0) at the beginning of the line is for the lowest perception (least interesting) until the value of ten (10) at the end of the line is for the highest perception (most interesting). modifications to the position of the chin and lips both to the protrusion and retrusion positions of 2° , 6° , 8° and 10° respectively [19]. The profile picture given is in the form of a photograph rather than silhouette because it refers to Shaw's opinion that the assessment given by the respondent on the photograph giving results is more valid and representative than silhouette images.

In this study, it was clear that the level of education also influenced differences in perception. In this case, professional program students who have entered the practical stage (clinics) provide stricter assessments than academic program students who have not entered the clinical stage (Table 2). Furthermore, sex factors also showed that female groups gave a tighter assessment than the male group although the difference was not significantly different ($p > 0.05$). An interesting fact in this study is that the differences in perceptual assessments given based on both education level and sex remain more or less the same for the choice of subject profile images, namely 'D' profile with an angle of concavity of 186° as the most aesthetic and This assessment shows that perceptions decrease sequentially to the least/less interesting profile, namely 'E' profile with an angle of concavity of 196° , although the magnitude of perceptual assessment is not exactly the same. Thus, it can be said that the level of education that allows for exposure to information in the learning process is proven to have a significant influence on aesthetic perceptions ($p < 0.05$), especially participants in this study

Conclusion

This research has proven that the aesthetic perception of the students of the faculty of dentistry Prof. DR. Moestopo University towards concave facial profiles is expressed with a profile angle of 186° . This tolerance of aesthetic perceptions of concave facial profiles is inversely proportional to the angle of the face profile.

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Declaration

The researcher/author stated that there was no conflict of interest with participants in this study.

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