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CASE STUDY

INFLUENCE OF LOWER LIP POSITION FOR VARYING DEGREES OF CHIN PROMINENCE IN FACIAL ATTRACTIVENESS

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ABSTRACT

Introduction: The oro-facial region is usually an area of significant concern for the individual. Lip protrusion and chin prominence is assumed to be most important factor in assessment of male and female facial attractiveness.

Aims and Objectives: To evaluate influence of the lower lip prominence for varying degrees of chin prominence in male and female in the sagittal plane by lay people and orthodontists.

Materials and Methods: An idealized profile image of male and female was selected. The image was manipulated to create six images each demonstrating different degrees of retrogenia and progenia altered in 4-mm increments from -12 mm to +12 mm and six images each demonstrating chin and lower lip prominence in 4-mm increments from -12 mm to +12 mm. Laypeople and orthodontists ranked the images from the most to the least attractive by Visual Analog Scale.

Results: It was seen that in males, when chin is protrusive- forward lower lip and if chin is retrusive- unaltered lower lip was more attractive. In females, when chin is protrusive- unaltered lower lip and if chin is retrusive- unaltered lower lip was more attractive. No difference of opinion was seen between orthodontists and laypeople.

Conclusion: The ideal and preferred sagittal position of chin is on or in front true vertical line, with slight forward lower lip for male while for female chin position on or behind true vertical line with unaltered lower lip position. Overall direction of opinion was same for lay people and orthodontists.

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INTRODUCTION

The oro-facial region is usually an area of significant concern for the individual because it draws the most attention from other people in interpersonal interactions and is the primary source of vocal, physical, and emotional communication. The facial profile plays an important role in perceptions of facial esthetics. (FaranakModaraia *et al*., 2013; Naini, 2011) Long time ago the hunt for an ideal shape of the face was started by the artists, anthropologists, surgeons and orthodontists from different countries, but neither of them could approach the unbroken opinion. Convexity, lip projection and projection of teeth strongly differed in estimation of ideal face. The cause might be the difference in perception of beauty and esthetics in every culture. Lip protrusion is assumed to be most important factor in assessment of male and female facial attractiveness. In assessment of facial profile, lip projection may be determined by lip thickness, lip tonicity, nose and face type.

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(Faranak Modaraia *et al*., 2013; Naini, 2011; Brock *et al*., 2005) Peck and Peck found that compared to orthodontists, laypeople preferred lip profiles that were more protrusive. (Faranak Modaraia *et al*., 2013; Peck and Peck, 1970) As per studies, Europeans consider most attractive faces to be those with typical or slightly protruded jaws and bigger lip projection. In Indian population very few such studies have been undertaken hence to evaluate the perception of attractive profile in male and females we have undertaken this study.

Aims and objectives

1. This study aims to evaluate the influence of the lower lip position for varying degrees of progenia and retrogenia.
2. It will also assess differences in preference between orthodontists and laypeople in male and female profiles.

MATERIALS AND METHODS

Facial image of a 20 year old female and male subject with no orthodontic treatment, who fulfilled the criteria of soft tissue

normative value and balanced smile, was obtained. Adobe Photoshop 7 was used for modification of images.

Fig.1. Ideal facial profile

The ideal facial profile was manipulated such that the mandibular prominence (lower lip and chin) was altered in 4mm increments from -12 mm to +12 mm.

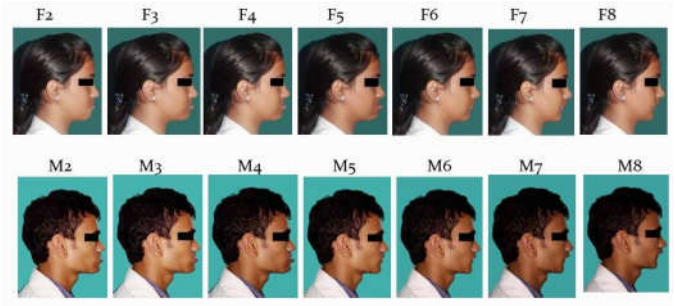

Figure 2. Lip and chin manipulation, from left to right: M2, F2(+4mm); M3, F3 (+8mm); M4, F4 (+8mm); M5, F5 (+12mm); M6, F6 (-4mm); M7, F7 (-8mm); M8, F8 (-12mm)

The same images were manipulated such that the lower lip was not altered and so that only the chin prominence was altered by the same increments (ie, -12 mm to +12 mm).

Figure 3. Chin-only manipulation, from left to right: M9, F9 (+4mm); M10, F10 (+8mm); M11, F11 (+12mm); M12, F12 (-4mm); M13, F14 (-8mm); M14, F14 (-12mm)

The images were presented to 20 laypeople and 10 orthodontists. The observers were asked to rank the images in order from most attractive to least attractive.

Statistical analysis

The observer's ranks were recorded from 1 through 14 for each image for both male and female. Mean ranks across observers were calculated for each image and used to establish a final rank for the 14 images. Univariate regressions were followed by multivariate regressions in order to adjust for the effects of possible confounders (eg, the direction and amount of chin prominence and whether the lower lip was involved in the image manipulation).

RESULTS

Reliability of the Measure

Images 3 and 4 were identical. For these two images, the intraobserver variability was highly significant, indicating a fair agreement within observers for the two images. The mean rank given by othodontists and lay person is shown in Table 1.

Table 1. Mean Ranks

ORTHODONTISTS				LAYPEOPLE			
Male		Female		Male		Female	
Image	Mean Rank	Image	Mean Rank	Image	Mean Rank	Image	Mean Rank
Image 9	2	Image 1	1.9	Image 1	2.3	Image 1	1.7
Image 1	2.5	Image 9	3.1	Image 9	2.7	Image12	3.7
Image 2	2.6	Image12	4.1	Image12	4.3	Image 9	4.1
Image12	4	Image 6	4.2	Image10	5.5	Image 6	5.1
Image 6	6.6	Image10	4.9	Image 2	6.4	Image13	5.1
Image13	7.2	Image13	5.8	Image13	6.5	Image10	6.2
Image14	7.7	Image 2	6.9	Image 6	6.7	Image14	7.4
Image10	7.9	Image11	9.1	Image14	8.2	Image 2	8.7
Image 7	9.3	Image14	9.2	Image11	8.5	Image11	9.4
Image11	9.7	Image 3	10.5	Image 8	9.5	Image 7	9.5
Image 4	10.2	Image 5	10.7	Image 7	9.6	Image 4	10
Image 8	11.1	Image 7	11.1	Image 4	10.5	Image 3	11
Image 3	12.1	Image 4	11.5	Image 3	11.2	Image 5	11.5
Image 5	12.1	Image 8	12.5	Image 5	13.1	Image 8	11.6

Table 2. Multiple Linear Regression of Mean Ranks (Orthodontist- female data)

ORTHODONTISTS- FEMALE DATA				
Mean rank	Coefficient	95% CI		P-value
Direction (Protrusion vsRetrusion)	-0.241	-3.2624	2.7790	0.8582
Amount Of Deviation	0.6493	0.2985	1.000	0.00272
Lower Lip (Lip vs No Lip Involvement)	3.2694	-0.2569	6.7957	0.06497
Interaction Of Lip By Direction	0.55833	-2.7588	3.8755	0.7080
Interaction Of Amount By Direction	0.01180	-0.3389	0.3625	0.940036

Table 3. Multiple Linear Regression of Mean Ranks (Orthodontist-male data)

ORTHODONTISTS - MALE DATA				
Mean rank	Coefficient	95% CI		P-value
Direction (Protrusion vsRetrusion)	-0.85	-4.727	3.0273	0.6268
Amount Of Deviation	0.616666	0.1664	1.0668	0.0134
Lower Lip (Lip vs No Lip Involvement)	1.2083	-3.317	5.7346	0.555
Interaction Of Lip By Direction	0.975	-3.282	5.2328	0.6117
Interaction Of Amount By Direction	0.15416	-0.296	0.6043	0.4524

Table 4. Multiple Linear Regression of Mean Ranks (Laypeople- female data)

LAYPEOPLE - FEMALE DATA				
Mean rank	Coefficient	95% CI		P-value
Direction (Protrusion vsRetrusion	0	-1.60	1.60	0
Amount Of Deviation	0.5354	0.349	0.721	0.00016
Lower Lip (Lip vs No Lip Involvement)	2.95	1.081	4.818	0.0065
Interaction Of Lip By Direction	0.783	-0.9744	2.541	0.334
Interaction Of Amount By Direction	0.072	-0.112	0.258	0.3920

Table 5. Multiple Linear Regression of Mean Ranks (Laypeople- female data)

LAYPEOPLE - MALE DATA				
Mean rank	Coefficient	95% CI		P-value
Direction (Protrusion vsRetrusion)	-0.525	-2.56	1.5167	0.569
Amount Of Deviation	0.5243	0.2872	0.7613	0.0093
Lower Lip (Lip vs No Lip Involvement)	3.052	0.669	5.436	0.0183
Interaction Of Lip By Direction	1.37	-0.867	3.6170	0.19502
Interaction Of Amount By Direction	0.036	-0.2002	0.2738	0.72958

Table 6. f- test

Group	P-value
Male	1
Female	0.977836

Analysis of Mean Ranks

The first three favored images, according to the ordered mean ranks, were images 9, 1 and 2 for male profile and 1, 9 and 12 for female profile. The three most disliked images, according to the ordered mean ranks, were images 8, 3 and 5 for male profile and 3, 4 and 8 for female profile. Multiple linear regression of mean ranks of the male and female profiles is shown in Table 2,3,4,5. It shows that in orthodontist's perspective, there is significant change in the rank by the amount of deviation in both male (p value - 0.0134) and female (p value- 0.002)profiles (Table 2,3); while in lay person's perspective there is significant change in rank by the amount of deviation (Male p value- 0.00093, Female p value-0.000162) and also by lower lip involvement (Male p value- 0.018325, Female p value-0.006583) in both male and female profiles (Table 4,5). Direction, interaction of lip by direction and interaction of amount by direction does not affect the ranking in both orthodontist and lay person perspective.

DISCUSSION

Facial profile plays an important role in the esthetics of a person. The outlook of an orthodontist is different than the lay people in regard to a person's esthetics. Thus as an orthodontist is important to know the perception of lay people, hence this study is carried out. In this study, an ideal profile image of male and female subject with no orthodontic treatment, who fulfilled the criteria of soft tissue normative value and balanced smile, was obtained to create six images each demonstrating different degrees of retrogenia and progenia from -12 to +12mm & six images demonstrating chin and lower lip prominence from -12 mm to +12 mm. These images were ranked by 20 laypeople and 10 orthodontists. The most attractive male profile for the orthodontist is the one with +4mm chin protrusion while least attractive was +12mm chin-lip protrusion. For the lay people, the most attractive male profile was the ideal profile while least attractive was +12mm chin-lip protrusion. In female profile, the ideal profile was most attractive while -12mm chin-lip retrusion was the least attractive for both orthodontist and lay people. The general trend here demonstrates that minor degrees of chin retrusion or protrusion were rated as more attractive and greater degrees of deviation were rated as less attractive, as seen in study done by FaranakModarai *et al*. (2013). This is also seen in studies done by Naini *et al*. (2012) Kuroda *et al*. (2009).

Influence of lower lip on attractiveness

In males, if chin is protrusive- forward lower lip is more attractive (Image 2 Orthodontist - mean rank 2.6, lay people mean rank- 6.4) while if chin is retrusive - unaltered lower lip is more attractive (Image 12 Orthodontist-Mean rank- 4, Lay people- Mean rank-4.3). In females, if chin is protrusive-unaltered lower lip is more attractive (Image 9 Orthodontist - mean rank 3.1, lay people mean rank- 4) while if chin is retrusive-unaltered lower lip is more attractive (Image 12 Orthodontist - mean rank 4.1, lay people mean rank- 3.7). Thus, positive direction made image more attractive in male while in female it was found to be less attractive (even if chin alone was manipulated). When the chin was retrusive, a more forward lip position was favored. FaranakModarai *et al*. (2013) Kuroda *et al*. (2009) found that chin prominence in progenic patient is deemed less attractive whereas here in male we

found it to be more attractive. This study was consistent with their finding that for more prominent chin a more protrusive lower lip position was preferred & when the chin was retrusive, a normal lower lip position was preferred to a retrusive lip. It is also confirmed by Czarnecki *et al*. (1993) in that greater lower lip protrusion was favored where there was a prominent chin, and the least favored profile was an unaltered lip profile with a prominent chin. According to Coleman *et al*. (2007) more full lip positions relative to Ricketts' E-plane were generally preferred for the more extreme retrognathic and prognathic profiles, whereas more retrusive lip positions were preferred for the more average profiles. In this study, there was no significant difference between orthodontists and laypeople in terms of image rankings of male and female profiles. Test used was f test (Table 6). These findings indicate that there is agreement between clinicians and laypeople in choosing the preferred profile.

Conclusion

- The ideal and preferred sagittal position of chin is on or in front the true vertical line, with slight forward lower lip for male while for female chin position on or behind the true vertical line with unaltered lower lip position.
- Overall direction of opinion was same for lay people and orthodontists. Chin protrusion was more attractive for male profile and slight retrusive chin or no change was more attractive for females.
- Laypeople were more concerned about lower lip position than orthodontists.
- The most important factor in profile attractiveness was the amount of sagittal discrepancy.

Hence it is important to keep into consideration these points in the orthodontic treatment that male and female profiles are expected to be different in relation to the lower lip and chin.

REFERENCES

Brock RA, Taylor RW, Buschang PH, Behrents RG. 2005. Ethnic differences in upper lip response to incisor retraction. *Am J OrthodDentofacialOrthop*., 127:683–691.

Burstone CJ. 1958. The integumental profile. *Am J Orthod*., 44:1-25.

Burstone CJ. 1967. Lip posture and its significance in treatmentplanning. *Am J Orthod*., 53:262-84.

Coleman GG, Lindauer SJ, Tukekci E, Shroff B, Best AM. 2007. Influence of chin prominence on esthetic lip profile preferences. *Am J OrthodDentofacialOrthop*., 132:36–42.

Cox NH. And Vander Linden FPGM. 1971. Facial harmony. *Am J Orthod*., 60:175-83.

Czarnecki ST, Nanda RS, Currier GF. 1993. Perceptions of a balanced facial profile. *Am J OrthodDentofacialOrthop*., 104:180–187.

De Smith A. and Dermaut L. 1984. Soft tissue profile preferences. *Am J Orthod*., 86: 67- 73.

Downs WB. 1948. Variations in facial relations: their significance in treatment and prognosis. *Am J Orthod*., 34: 812- 840.

Downs WB. 1956. Analysis of the dentofacial profile. *Angle Orthod*., 26: 191- 212.

FaranakModaraia *et al*. 2013. The influence of lower lip position on the perceived attractiveness of chin prominence. *Angle Orthod*., 83:795–800.

Hier La, Evans CA, BeGole EA, *et al*. 1999. Comparison of preferences in lip position using computer animated imaging. *Angle Orthod*., 69: 231- 238.

Johnston C, Hunt O, Burden D, *et al*. 2005. The influence of mandibular prominence on facial attractiveness. *Eur J Orthod*., 27: 129- 133.

Kuroda S, Sugahara T, Takabatake S, Taketa H, Ando R, Takano-Yamamoto T. 2009. Influence of anteroposterior mandibular positions on facial attractiveness in Japanese adults. *Am J OrthodDentofacialOrthop*., 135:73–78.

Naini FB, Donaldson AN, Cobourne MT, McDonald F. 2012. Assessing the influence of mandibular prominence on perceived attractiveness in the orthognathic patient, clinician and layperson. *Eur J Orthod*., 34:738–746.

Naini FB, Donaldson AN, McDonald F, Cobourne MT. 2012. Assessing the influence of chin prominence on perceived attractiveness in the orthognathic patient, clinician and layperson. *Int J Oral Maxillofac Surg*., 41:839–846.

Naini FB. 2011. Facial Aesthetics: Concepts and Clinical Diagnosis. Oxford, UK: Wiley-Blackwell.

Peck H. and Peck S. 1970. A concept of facial esthetics. *Angle Orthod*., 40:284–318.

Perception of facial profile: How you feel about yourself. International journal of clinical pediatric dentistry, May-August 2011; 4(2):109-111.

Pratik Doshi, AjitKalia, *et al*. 2014. Evaluation of the facial profile by alteration of lip position in Indian Maratha male and female population. *International Journal of Dental and Medical Speciality*, Oct- Dec, 1(2): 7- 10.

Singh J. 2011. Preference of lip profile in varying mandibular sagittal position. *J Int Oral Health*, 3:47–57.

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