

Influence of lip protrusion and thickness on the perception of facial profile attractiveness among subjects with different ethnic backgrounds

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ABSTRACT

Objectives: To evaluate the influence of lip protrusion and thickness on the perception of facial profile attractiveness among subjects with different ethnic backgrounds.

Materials and Methods: 424 participants were divided into four groups (European, Black African, Far Eastern, and Middle Eastern) and further subdivided into two subgroups according to age (18 to 40 and 41 to 60 years). An idealized female profile silhouette image was manipulated to generate 18 images with three different lip thicknesses and six sagittal lip positions. To assess perception of facial profile attractiveness, participants completed the developed questionnaire.

Results: Statistically significant differences were found among subjects with different ethnic backgrounds for all images ($P < .01$). Percent agreement averaged 13.89%. Within each group, scores varied with lip thickness and protrusion, with significant interaction between the two factors. Gender and age had a significant impact on profile attractiveness mean scores.

Conclusions: Ricketts norms for the most favorable lip position to E-line need to be updated. Middle Eastern and Europeans regarded lips positioned + 1 mm to the norm in relation to E-line as the most attractive. Thick lips that were mildly protruded were preferred by Africans. Far Eastern participants preferred normal thickness and thin lips that were protrusive; thick lips were ranked lowest. Among the thick lips, protrusive lips were ranked higher. More personalized and culturally sensitive orthodontic treatment planning is needed to help patients achieve their desired facial esthetic outcome. (*Angle Orthod.* 2025;00:000–000.)

KEY WORDS: Race; Profile; Lip thickness; Protrusion; E-line

INTRODUCTION

Orthodontic patients are now more aware of the importance of facial esthetics in their social interactions. In this era, women are attracted to cosmetic surgery clinics and makeup counters to increase the protrusion of their lips to meet contemporary social media standards and trends. Ricketts in 1957 emphasized the significance of lip prominence in relation to the nose and

chin by describing the E-line as a reference line for lip position.¹ For Caucasian subjects, it was claimed that both lips should lie behind that line (4 mm for the upper lip and 2 mm for the lower lip). This might raise the question whether this reference would still be valid more than 60 years later. The concept that perception of facial attractiveness can be affected by time-dependent variations was investigated by Auger et al.² In more recent investigations, there was a preference for larger lips in female individuals as well as a trend toward fuller lips that were more anteriorly positioned.³

Racial and cultural background can also affect the perception of facial profile attractiveness. In addition, travel, immigration, and the influence of international media can also significantly impact esthetic choices of different societies.⁴ Accordingly, orthodontists are now more likely to meet and treat patients with variable ethnic and cultural backgrounds. While many orthodontists work to treat bimaxillary protrusion with the aim of reducing lip prominence, patients have their own racial and cultural perceptions of beauty. This should be taken into consideration during orthodontic treatment planning.⁵

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Farrow et al. studied the perceptions of black Americans and found that a mild bimaxillary protrusion profile was considered as the most attractive.⁶ They observed that African Americans favored a straighter profile than the standard for their ethnicity but highly protrusive compared to the standards of white people. Hwang et al. reported that American-European white evaluators favored convex profiles while Korean evaluators preferred more concave profiles.⁷ In a similar study, Japanese orthodontists and young adults preferred a retruded profile, despite the fact that convex features were historically more characteristic of Japanese profiles.⁸ Nomura et al. investigated differences in esthetic preference of raters from European American, Hispanic American, Japanese, and African backgrounds;⁹ all observers favored more retruded lip positions, with the African panel preferring the least retrusive of the four groups.

Other factors likely to influence perception of attractiveness are rater's age and gender. In a study by Shimomura et al., no significant differences were found between male and female raters in selecting the top three profiles that were perceived as the most esthetic.¹⁰ However, the group of patients who were over 30 years old favored a more retruded lip position than did younger age groups for the female profile.

Despite the significant impact of facial profile aesthetics on social and psychological wellbeing, there is still a limited understanding of how cultural factors may influence the perception of lip protrusion and thickness with respect to facial attractiveness. While orthodontic treatment often aims to improve facial harmony and balance, the lack of consensus on universal beauty standards and the potential for cross-cultural variation in esthetic preferences, raises questions about the extent to which orthodontic interventions can address the diverse need and expectations of different populations. Previous work focused mainly on lip position as a factor influencing perception of profile esthetics. However, the interaction between lip thickness and protrusion also merits special attention. Therefore, the aim of this study was to evaluate the influence of lip protrusion and thickness on the perception of facial profile attractiveness among subjects with different ethnic backgrounds. Understanding these variations can help orthodontists personalize treatment goals, improve patient satisfaction, and align treatment outcomes with culturally influenced esthetic preferences.

MATERIALS AND METHODS

This was a questionnaire-based study and was approved by the Research Ethics Committee of the University of Sharjah (approval number: REC-22-11-26-01-PG). Sample size was calculated by G*Power software (version 3.1.9.7, Düsseldorf, Germany) using parameters from a previous study.¹¹ At a significance

Table 1. Details of the Included Participants

Groups	Total Number (n)	Age (n, %)		Gender (n, %)	
		18–40 y	41–60 y	Females	Males
Group A (Black African)	94	50 53.2%	44 45.4%	55 58.5%	39 41.5%
Group B (European)	93	51 54.8%	42 45.2%	48 51.6%	45 48.4%
Group C (Far Eastern)	118	60 50.1%	58 49.2%	55 46.6%	63 53.4%
Group D (Middle Eastern)	119	56 47.1%	63 52.3%	65 54.7%	54 45.4%
Total	424	217	207	223	201

level (type one error) of 0.05 and power of 0.80, a minimum sample size of 90 subjects per group was required with a total sample size of 360 subjects.

A total of 424 participants aged 18–60 years old were included. Subjects were excluded if they had syndromes or craniofacial malformations, lived outside their native country for more than 10 years, or had mixed origins (parents from different races).

Participants were divided into four groups based on their ethnic background; Group A, Black African; Group B, European; Group C, Far Eastern; and Group D, Middle Eastern. In addition, within each group, they were further subdivided based on their age into two subgroups: subgroup A, 18 to 40 years old and subgroup B, 41 to 60 years old (Table 1).

A lateral cephalogram for a female participant was manipulated using computer software (Photoshop CS4, Adobe, San Jose, Calif). Linear and angular soft tissue measurements were set to be within the accepted normal values for the Caucasian race. To assess the influence of lip protrusion on facial profile attractiveness, the sagittal position of the upper and lower lips in the idealized image was altered in 1-mm increments relative to the E-Line. This resulted in six images representing varying degrees of lip protrusion in the sagittal dimension. In addition, lip thickness was altered in 2-mm increments to have thin lips (upper lip, 14.6 mm; lower lip, 10.2 mm) and thick lips (upper lip, 18.6 mm; lower lip, 14.2 mm) in addition to the average lip thickness (upper lip, 16.6 mm; lower lip 12.2 mm) in each sagittal position of the six sagittal positions. This resulted in a total of 18 profile silhouette images (Figure 1 and Table 2).

Participants were asked to reply to a questionnaire and were asked to provide their age, gender, profession, ethnic origin of parents, and how long they lived abroad (outside their native country). Images were placed randomly in a PowerPoint presentation and participants were then asked to rate the attractiveness of the facial profile in each of the 18 images as viewed on a 17-inch flat-screen. They were asked to rate the attractiveness of the facial profile in each image using a Likert-type rating scale of 1 to 5 according to the following: 1,

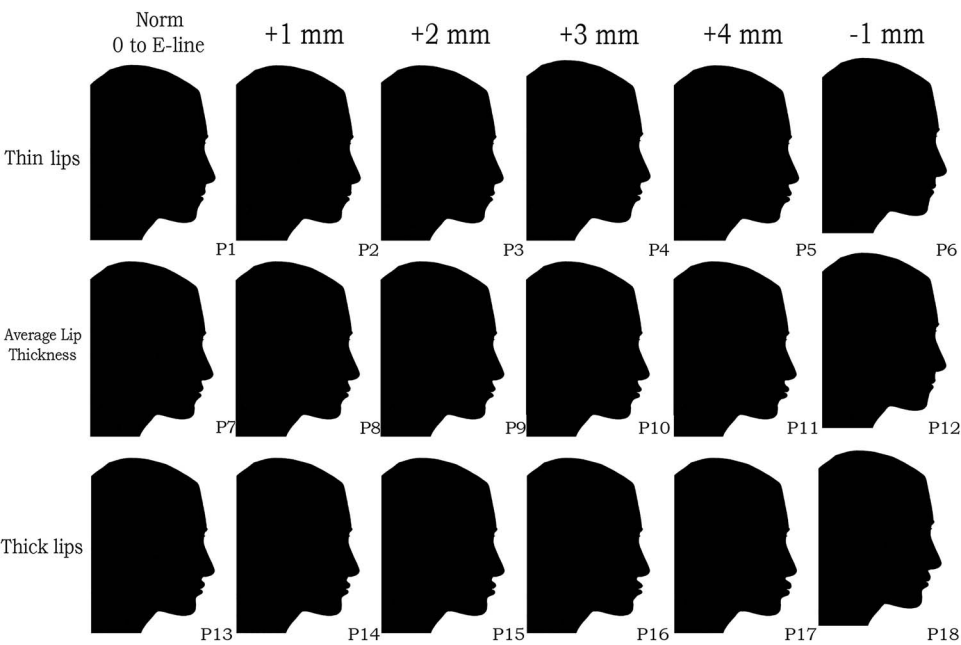


Figure 1. The 18 facial profile images used in the study with three different lip thicknesses (thin, normal, and thick) and six different sagittal positions to the E-Line (0, + 1, +2, + 3, +4, –1 mm).

extremely unattractive; 2, unattractive; 3, neither attractive nor unattractive; 4, attractive; and 5, extremely attractive. Each image was identified by a randomly assigned double letter followed by a number (eg, HT1, TT1, NT1). A duplicate image was added to the questionnaire to assess intra-examiner reliability.

Statistical Analysis

All data were collected, tabulated, and analyzed statistically. Statistical analysis was performed by SPSS

software (version 20). Kruskal–Wallis test was used for comparing the mean attractiveness score of the four groups for each profile. General linear model (GLM) univariate analysis of variance model with two fixed effects was applied for analyzing the influence of lip thickness and protrusion and their interaction on the attractiveness score. Similarly, this was applied to analyze the effects of race and gender and their interaction, as well as the effect of race and age and their interaction on the attractiveness score (Significant at $P < .05$). Two-tailed tests were assumed throughout the analysis for all statistical tests.

Intra-examiner reliability was assessed using Cronbach’s Alpha coefficient. This was equal to 0.933, which demonstrated that the instrument was internally consistent and discriminations between pictures at different score levels on the test were stable differences.

RESULTS

Table 3 shows the mean and standard deviation scores for the different ethnic groups for each facial profile image. Statistically significant differences were found among subjects with different ethnic backgrounds ($P < .01$) for all 18 facial profile images. For most of the profile images, Group A (Black Africans) had the highest scores, whereas subjects from Group C (Far Eastern) had the lowest. Table 4 shows the ranking of the facial profile images within each ethnic group. The percentage of agreement among the four ethnic groups was only 13.89%. Profile P4 (+3 to norm) was found to be the most unattractive in two ethnic

Table 2. Description of the 18 Facial Profile Images Used in the Study

Lip Thickness	Image	Description	Distance to E-Line	
			Lower Lip	Upper Lip
Thin lips	P1	Norm	–2 mm	–4 mm
	P2	+1 to Norm	–1 mm	–3 mm
	P3	+2 to Norm	0 mm	–2 mm
	P4	+3 to Norm	1 mm	–1 mm
	P5	+4 to Norm	2 mm	0 mm
	P6	–1 to Norm	–3 mm	–5 mm
Normal lip thickness	P7	Norm	–2 mm	–4 mm
	P8	+1 to Norm	–1 mm	–3 mm
	P9	+2 to Norm	0 mm	–2 mm
	P10	+3 to Norm	1 mm	–1 mm
	P11	+4 to Norm	2 mm	0 mm
	P12	–1 to Norm	–3 mm	–5 mm
Thick lips	P13	Norm	–2 mm	–4 mm
	P14	+1 to Norm	–1 mm	–3 mm
	P15	+2 to Norm	0 mm	–2 mm
	P16	+3 to Norm	1 mm	–1 mm
	P17	+4 to Norm	2 mm	0 mm
	P18	–1 to Norm	–3 mm	–5 mm

Table 3. Facial Profile Attractiveness Scores for the Four Different Ethnic Groups

Profile image		Group A (Black African)		Group B (European)		Group C (Far Eastern)		Group D (Middle Eastern)		P Value
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Thin lips										
Norm	P1	3.33	1.30	3.53	0.82	2.18	0.89	3.55	1.03	0*
+1 to Norm	P2	3.46	0.98	3.55	0.88	2.43	0.85	3.26	1.19	0*
+2 to Norm	P3	3.31	1.27	2.65	0.87	2.86	1.21	3.06	1.26	.0012*
+3 to Norm	P4	2.96	1.05	2.25	0.80	2.82	1.29	2.46	1.38	0*
+4 to Norm	P5	3.21	1.03	2.58	0.88	2.71	1.21	2.68	1.28	0*
-1 to Norm	P6	3.38	1.02	3.23	0.77	2.34	0.98	3.31	1.05	0*
Normal lip Thickness										
Norm	P7	3.30	1.30	3.45	0.99	1.93	0.80	3.45	1.07	0*
+1 to Norm	P8	3.84	0.80	3.81	0.80	2.28	0.87	3.64	1.11	0*
+2 to Norm	P9	3.97	0.91	3.34	0.74	2.52	1.08	3.63	1.07	0*
+3 to Norm	P10	3.24	0.90	3.36	0.85	2.63	1.04	2.94	1.21	0*
+4 to Norm	P11	3.09	1.09	2.25	0.94	2.93	1.19	2.51	1.36	0*
-1 to Norm	P12	3.49	1.15	2.87	0.97	2.09	0.83	2.65	1.28	0*
Thick lips										
Norm	P13	3.71	0.91	2.96	0.90	2.24	0.99	3.00	1.31	0*
+1 to Norm	P14	3.84	0.99	3.12	0.90	2.27	0.85	3.04	1.14	0*
+2 to Norm	P15	4.05	0.92	3.29	0.88	2.27	0.95	3.24	1.18	0*
+3 to Norm	P16	3.80	1.00	3.29	0.89	2.39	1.15	3.32	1.23	0*
+4 to Norm	P17	3.66	0.97	3.23	0.92	2.57	0.83	3.25	1.19	0*
-1 to Norm	P18	3.18	1.12	3.02	0.69	2.14	0.95	3.00	1.28	0*

groups: Group A (Black African) and Group D (Middle Eastern). In addition, it was also ranked second last in Group B (European).

The interaction among various factors affecting the overall perception of attractiveness was determined statistically by plotting the graphs shown in Figure 2. The interaction of the parameters was evident from the intersection of the lines in the figures. Table 5 shows the results of the GLM univariate analysis of the variance model with two fixed effects. This showed that

lip thickness as a main effect was not statistically significant ($P = .5068$), and it showed the effect of gender ($P = .05595$). On the other hand, all other factors (lip protrusion, ethnicity, and age) as well as interaction among the factors, were shown to be statistically significant ($P < .05$).

DISCUSSION

The purpose of this study was to investigate the influence of lip protrusion and thickness on the perception of

Table 4. Ranking of the Facial Profile Images Within Each Ethnic Group^a

Lips			Group A (Black African)	Group B (European)	Group C (Far Eastern)	Group D (Middle Eastern)
Thin Lips	Norm	P1	11	3	15	3
	+1 to Norm	P2	9	2	8	7
	+2 to Norm	P3	12	15	2	10
	+3 to Norm	P4	18	17	3	18
	+4 to Norm	P5	15	16	4	15
	-1 to Norm	P6	10	9	10	6
Normal Lip Thickness	Norm	P7	13	4	18	4
	+1 to Norm	P8	3	1	11	1
	+2 to Norm	P9	2	6	7	2
	+3 to Norm	P10	14	5	5	14
	+4 to Norm	P11	17	18	1	17
	-1 to Norm	P12	8	14	17	16
Thick Lips	Norm	P13	6	13	14	12
	+1 to Norm	P14	4	11	12	11
	+2 to Norm	P15	1	8	13	9
	+3 to Norm	P16	5	7	9	5
	+4 to Norm	P17	7	10	6	8
	-1 to Norm	P18	16	12	16	13

^a Percentage of agreement = 13.89%.

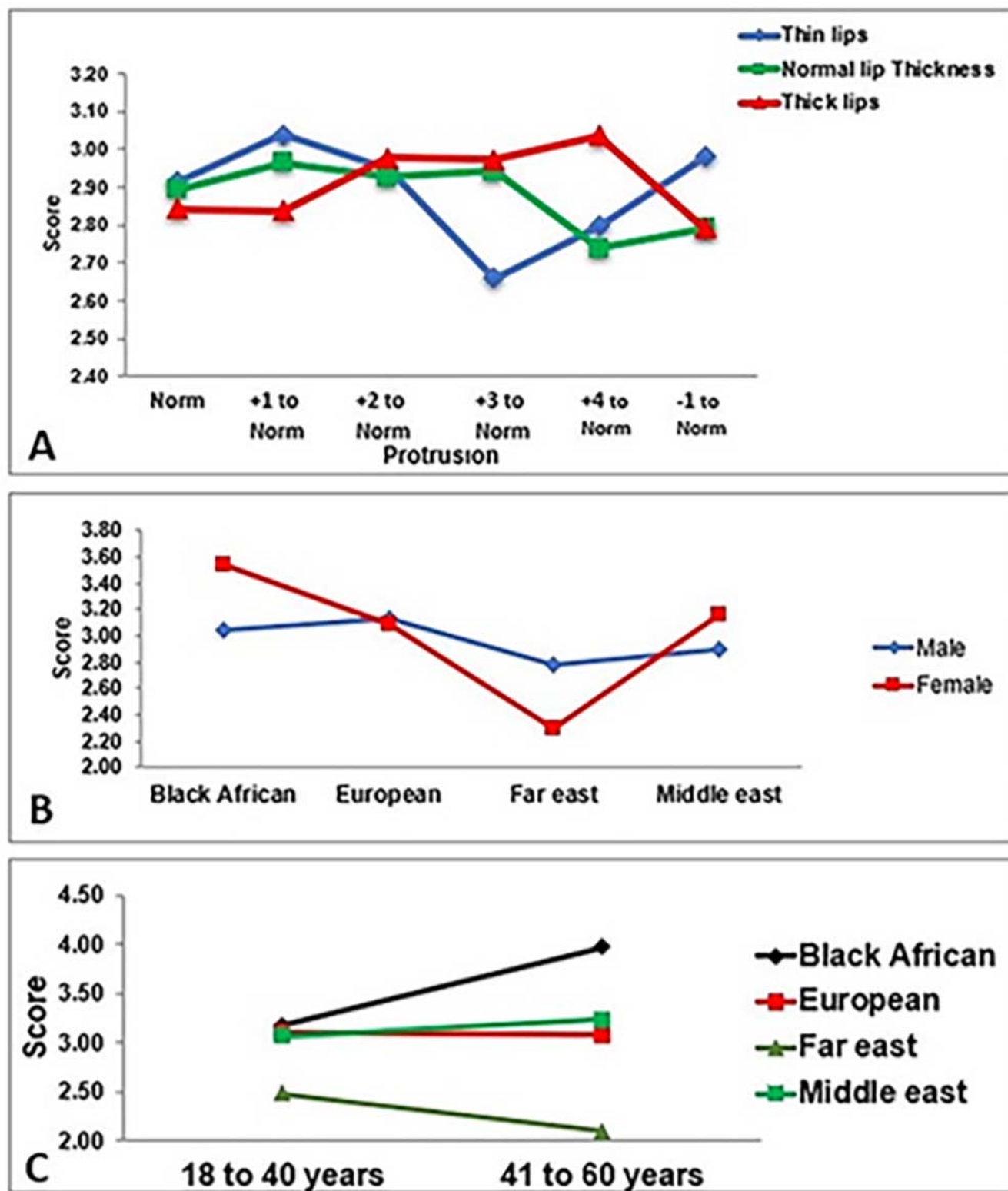


Figure 2. Interaction plot of (A), lip protrusion and thickness; (B) ethnicity and gender; and (C) ethnicity and age.

Table 5. Tests of Between-Subject Effects

Source	Type III Sum of Squares	df	Mean Square	F	P Value
Thickness	1.84	2	0.92	0.68	.5068
Protrusion	15.99	5	3.20	2.37	.0370*
Thickness * Protrusion	79.77	10	7.98	5.91	0*
Race	502.01	3	167.34	144.24	0*
Gender	4.24	1	4.24	3.65	.05595
Race * Gender	196.74	3	65.58	56.53	0*
Race	1628.19	3	542.73	472.84	0*
Age	33.88	1	33.88	29.52	0*
Race * Age	316.21	3	105.40	91.83	0*

^a General linear model univariate analysis of the variance model with two fixed effects.

* Significant at $P < .05$.

facial profile attractiveness among subjects with different ethnic backgrounds. In the current study, statistically significant differences were found among the four groups ($P < .01$) for all 18 facial profile images. The percentage of agreement among the four ethnic groups was only 13.89% (Table 4). By analyzing the variations in esthetic preference, this study aimed to enhance the understanding of the complex interplay between cultural norms and individual preferences in shaping the perception of facial attractiveness. Ultimately, this research may inform more personalized and culturally sensitive orthodontic treatment planning that can help patients achieve their desired facial esthetic outcome.

Subjects from Group A (Black African) preferred thick lips that were protrusive. Thin lips were ranked the lowest. Thin lips were ranked as more esthetic when they were less protruded. This was similar to the findings of the study by Farrow et al., in which it was determined that subjects from the black race found a mild bimaxillary protrusion profile to be the most attractive.⁶

On the other hand, subjects from Group C (Far Eastern) preferred lips of normal thickness and thin lips that were protrusive. Thick lips were ranked lowest. However, among the thick lips, protrusive lips were ranked higher. This was contrary to the findings of Shimomura et al. who reported that Japanese orthodontists and young Japanese adults preferred retrusive lips.¹⁰ Kollipara et al. demonstrated the influence of ethnicity on lip preferences and stress, supporting avoidance of generalizations in lip preferences.¹² In a study assessing lip preferences between surgeons and laypersons in Asia, preference differences were reported, with surgeons preferring fuller lips while laypersons preferred smaller lips.¹¹ Different preferences within the same ethnicity prompts the need to consider additional factors before lip augmentation.¹²

Subjects from the Middle Eastern and European groups had almost similar tastes, preferring lips of normal thickness positioned as the norm or mildly protrusive. P8 (lips of normal thickness positioned at + 1 to the norm)

was ranked as the most attractive among European and Middle Eastern participants.

Results from the current study indicated that mildly protrusive lips were perceived to be more attractive. A study by Jones also confirmed that, for a female image, + 2 mm protrusion of the lower lip from the E-line was preferred.¹³ However, lip protrusion was found to be undesirable if they protruded far beyond the E-line. In the current study, Profile P4 (+3 to E-line) was found to be the most unattractive in two groups: Group A (Black African) and Group D (Middle East). In addition, it also ranked second last in Group B (Europeans). This indicated that there seemed to be universal agreement that excessively protrusive lips were found to be unattractive across all ethnic groups.

Overall facial attractiveness is affected not only by lip protrusion but also thickness of the lips. In a study that compared lip attractiveness between thin and thick lips after filling with hyaluronic acid, thicker lips were rated more attractive than thinner lips both before and after filling. However, thicker lips scored higher (ie, more attractive) before filling.¹⁴ In the current study, investigation of the effect of lip thickness as an independent variable showed that there was less variation among the thickness scores. This indicated that thickness alone was not a major influence on profile attractiveness score among all subjects. However, lip thickness relates to facial profile indirectly through its interaction with other facial prominences to bring out the perception of beauty. In collaboration, lip thickness and protrusion influence people's perception of facial attractiveness. Similarly, the interaction of gender and ethnicity was also evident as a factor influencing the perception of facial attractiveness (Figure 2). On the other hand, Shimomura et al. reported that there was no significant difference between female and male subjects in selecting the most favored lip position.¹⁰

Facial profile attractiveness was perceived differently between the younger and older age groups. Group A (Black African) and Group D (Middle Eastern) elder groups had higher mean attractiveness scores than those evaluated by the younger age groups with 3.98/3.19 and 3.11/3.07 (elder/younger age score), respectively (Figure 2). For Group B (European), both age groups had an almost equal score of 3.09/3.11 (elder/younger age score). In Group C (Far Eastern), the younger age group had higher scores than the elder age group (2.10/2.48; elder/younger score). For a female profile, Shimomura et al. concluded that patients over 30 years preferred a more retruded lip position than 15- to 19-year-olds, and 20- to 29-year-old patients, which was slightly different from this study, considering the different age groups involved.¹⁰

This was the first study to investigate the combined effect of lip protrusion and thickness on the perception

of facial profile attractiveness among subjects with different ethnic backgrounds. The findings of this study would be valuable in orthodontic treatment planning and extraction/nonextraction decision making. Factors such as a patient's race, age, and gender have a strong influence on perception on facial esthetics and should be well taken into consideration. These ethnic preferences might guide pretreatment counselling, avoiding a "standard" approach, and promote more individualized treatment plans.

However, in this study, the upper and lower lip were evaluated as one entity instead of assessing protrusion and thickness for each. Both lips have different morphologies which bring out different perceptions of beauty when analyzed independently. In addition, this study utilized a single female silhouette to standardize the profile image and minimize variability in facial characteristics. However, this may limit the generalizability of the findings, as esthetic perception could differ when assessing male profiles or a range of facial morphologies. It can thus be recommended to conduct future studies incorporating male profiles and multiple images representing different facial structures to further explore these variations. Additional factors influencing lip esthetics, such as profession of observers, also should be assessed to avoid any generalizations arising from ethnic preferences.

CONCLUSIONS

Within the limitations of this study, the following conclusions can be drawn:

- Ricketts norms for the most favorable lip position to E-line need to be updated. Middle Eastern and Europeans regarded lips positioned + 1 to the norm in relation to E-line as the most attractive. Thick lips that were mildly protruded were preferred by Africans. Far Eastern participants preferred normal thickness, and thin lips that were protrusive. Thick lips were ranked lowest. Among the thick lips, protrusive lips were ranked higher.
- The percentage of agreement regarding the perception of profile attractiveness among the four ethnic groups was only 13.89%. More personalized and culturally sensitive orthodontic treatment planning is needed to help patients achieve their desired facial esthetic outcome.
- Lip protrusion had a greater influence on perception of facial profile attractiveness than lip thickness. There was a significant interaction between lip thickness and lip protrusion on the influence on perception of facial profile attractiveness.
- Lip protrusion was found to be undesirable if it extended far beyond the E-line. Profile P4 (+3 to E-line) was

found to be the most unattractive in two groups: Group A (Black African) and Group D (Middle East). In addition, it also ranked second last in Group B (Europeans).

- The findings of this study should be considered in orthodontic treatment planning, especially for extraction/nonextraction decision making. Factors such as patient ethnicity, age, and gender have a strong influence on perception on facial esthetics and should be taken into consideration.

REFERENCES

1. Ricketts RM. Planning treatment on the basis of the facial pattern and an estimate of its growth. *Angle Orthod.* 1957;27(1):14–37.
2. Auger TA, Turley PK. The female soft tissue profile as presented in fashion magazines during the 1900s: a photographic analysis. *Int J Adult Orthodon Orthognath Surg.* 1999;14(1):7–18.
3. Ghorbanyjavadpour F, Rakhshan V. Factors associated with the beauty of soft-tissue profile. *Am J Orthod Dentofacial Orthop.* 2019;155(6):832–843.
4. Saghir S, Hyland L. The effects of immigration and media influence on body image among Pakistani men. *Am J Mens Health.* 2017;11(4):930–940.
5. Arpino VJ, Giddon DB, BeGole EA, Evans CA. Presurgical profile preferences of patients and clinicians. *Am J Orthod Dentofacial Orthop.* 1998;114(6):631–637.
6. Farrow AL, Zarrinnia K, Azizi K. Bimaxillary protrusion in black Americans—an esthetic evaluation and the treatment considerations. *Am J Orthod Dentofacial Orthop.* 1993;104(3):240–250.
7. Hwang H-S, Kim W-S, McNamara JA. Ethnic differences in the soft tissue profile of Korean and European-American adults with normal occlusions and well-balanced faces. *Angle Orthod.* 2002;72(1):72–80.
8. Ioi H, Nakata S, Nakasima A, Counts A. Effect of facial convexity on antero-posterior lip positions of the most favored Japanese facial profiles. *Angle Orthod.* 2005;75(3):326–332.
9. Nomura M, Motegi E, Hatch JP, et al. Esthetic preferences of European American, Hispanic American, Japanese, and African judges for soft-tissue profiles. *Am J Orthod Dentofacial Orthop.* 2009;135(4):S87–S95.
10. Shimomura T, Ioi H, Nakata S, Counts AL. Evaluation of well-balanced lip position by Japanese orthodontic patients. *Am J Orthod Dentofacial Orthop.* 2011;139(4):e291–e297.
11. Heidekrueger PI, Szpalski C, Weichman K, et al. Lip attractiveness: a cross-cultural analysis. *Aesthet Surg J.* 2017;37(7):828–836.
12. Kollipara R, Walker B, Sturgeon A. Lip Measurements and preferences in Asians and Hispanics: a brief review. *J Clin Aesthet Dermatol.* 2017;10(11):19–21.
13. Jones B. Investigating Lip Protrusion Aesthetics by Comparing the Facial Investigating Lip Protrusion Aesthetics By Comparing The Facial Profile View With An Oblique View [master's thesis]. Nova Southeastern University; 2017.
14. de Queiroz Hernandez PM, Cotrin P, Valarelli FP, et al. Evaluation of the attractiveness of lips with different volumes after filling with hyaluronic acid. *Sci Rep.* 2023;13:4589.