

An Asian community's perspective on facial profile attractiveness

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Abstract - Objectives: To assess the facial profile preferences of laypersons in an Asian community and the influence of age, ethnic and gender on profile selection. Methods: A sample of 149 laypersons (65.1% Chinese, 21.5% Malays and 13.4% Indians), comprising of 112 females (75.2%) participated in the study. The mean age was 24.6 years (SD 4.4). A facial profile photograph and a lateral cephalometric radiograph of a Chinese male and female adult with a normal profile and a class I incisor and skeletal relationship were digitized to create a baseline template. Computerized digital photographic image modification was carried out on the template to obtain seven facial profiles [bimaxillary protrusion, protrusive mandible, retrusive mandible, normal profile (incisor and skeletal class I pattern), retrusive maxilla, protrusive maxilla and bimaxillary retrusion] for each gender. The laypersons were asked to rank the profiles of each gender on a scale of 1 (very attractive) to 7 (least attractive). *Results:* Orthognathic Chinese male and female profiles were perceived to be the most attractive. A male orthognathic profile with normative Chinese cephalometric values was perceived to be more attractive than a 'flatter' bimaxillary retrusive profile. Bimaxillary retrusion and normal Chinese female profiles were perceived to be the most attractive. A male or female profile with a protrusive mandible was judged to be the least attractive. Age, gender and ethnicity were nonsignificant predictors for the most attractive female profile. Conclusions: Orthognathic Chinese male and female profiles were judged to be the most attractive by Asian adult laypersons. Male and female profiles with mandibular protrusion were judged to be the least attractive.

Facial attractiveness is an important physical attribute on which perceived personality traits and social ability are formulated by society (1–6). Cognitive science has shown that perception of facial attractiveness displayed sexual dimorphism and crosscultural similarity in the selection of facial features that constitute an attractive face (7–9). The relevance of facial esthetics in dentistry has gained greater attention in modern times. Prosthodontic oral rehabilitation (10, 11) and orthodontic-surgical correction of dentofacial deformities (12, 13) are treatment approaches that recognize the importance of soft tissue influence on facial attractiveness.

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Self-perceived dentofacial attractiveness was found to have an impact on orthodontic treatment uptake (14, 15). Improvement of facial esthetics was the primary motivation in adults who had orthognathic surgery carried out (16–21). Measurements made on cephalometric radiographs that define facial morphology were poorly correlated with self-perception of facial esthetics (22–25). The rating of facial attractiveness was found to be influenced by the direction from which the face was assessed. The level of dental training also had an influence on the rating of facial attractiveness (26).

Previous studies found that White subjects, especially females, with class I skeletal relationships were perceived to be the most attractive while those with class II dentofacial features were the least favored (27, 28). Chinese laypersons considered a Chinese male profile with either a bimaxillary protrusion or dental retrusion on a balanced skeletal relationship to be equally attractive. A male or female profile with a retrognathic mandible or prognathic mandible was judged to be unattractive (29). A study conducted in the Japanese population found that a straight profile was ranked to be the most attractive profile while mandibular retrognathic and prognathic profiles were ranked to be the least attractive profile (30). A significant difference in the perception of facial profile attractiveness was found between clinicians and laypersons (31, 32).

Although most people do not usually view themselves and others from a profile view, it was evident from the literature that there was a difference in the perception of facial profile esthetics between laypersons and clinicians, and even among clinicians themselves. Globalization and world economics has brought about an exchange of human workforce between Asian and Western populations in recent years. Thus it would be timely to determine the perception of Chinese profile attractiveness by Asian laypersons. Such information could assist dental surgeons to better manage the facial esthetic expectations of Asian dental patients, in particular, orthodontic patients. The main objective of this study was to assess the Chinese facial profile preferences of laypersons in a multi-ethnic Asian community and to determine if age, ethnicity and gender have an influence on their preferences. A second objective was to determine whether Asian laypersons preferred normal Chinese profiles to White profiles in Chinese male and female subjects.

Materials and methods

The adult sample consisted of 97 Chinese (65.1%), 32 Malays (21.5%) and 20 Indians (13.4%). Of the 149 subjects, 112 (75.2%) of them were females. The sample had relatively more Malays and females but fewer Chinese compared with the national ethnic and gender demographics (33). The mean and median ages were 24.6 (SD 4.4) and 23.0 years (range: 19.0–41.0). The participants were sampled

from a nondental teaching institution and all had higher educational qualifications.

Profile slides (35-mm) of a Chinese male and female adult with normative Chinese cephalometric values (34) and class I occlusion were scanned with the use of the Nikon Coolscan III film scanner (1350 pixels/inch, 3669×2273 pixels; Nikon, Tokyo, Japan). The color image was converted into gravscale using Adobe Photoshop (version 7.0, Adobe Systems Incorporated, San Jose, CA, USA). Lateral cephalograms taken at natural head posture were scanned using Epson Twain Pro backlit scanner (150 pixel/inch, 884 × 1231 pixels; SEIKO Epson Corporation, Nagano, Japan). Computer-assisted simulation system for orthognathic surgery 2001 (CASSOS2001; SoftEnable Technology Ltd, Hong Kong) cephalometric software was used to match the scanned and digitized lateral cephalogram and profile image of each gender. Thereafter, the original images (normal male and female profile; Fig. 1) with their respective lateral cephalograms were used to generate six other profile images by manipulating the hard tissue cephlometric values (Sella-Nasion-A point angle; Sella-Nasion-B point angle; A point-Nasion-B point angle, upper incisormaxillary plane angle and lower incisor-mandibular plane angle) from their normative values by at least 2 SD in the anteroposterior plane with minimal changes made to the vertical plane. This was carried out to produce facial profile images with normal vertical proportions. The seven profiles accounted for the anteroposterior growth patterns of the maxilla and mandible as well as the bimaxillary protrusive profile typically associated with Chinese subjects and the bimaxillary retrusive profile commonly associated with White subjects. Each image had only one skeletal component or bimaxillary dental components manipulated and the manipulation details are given in Table 1. The seven Chinese male and female profiles generated are displayed in Fig. 1.

The laypersons were asked to rank the seven profiles of each gender on a scale of 1 (very attractive) to 7 (least attractive) without any repeat of rank at the same session. The seven profiles of each gender were placed side-by-side for assessment at the same session. The order of arrangement of the male and female profiles was deliberately varied to prevent profile pattern recognition during assessment.

All statistical analyses were carried out using SPSS (Version 13.0) (35). A comparison of



Fig. 1. Male and female facial profiles. 'Reprinted with permission from the *American Journal of Orthodontics and Dentofacial Orthopedics*: Soh J, Chew MT, Wong HB, A comparative assessment of the perception of Chinese facial profile esthetics, 2005; 127: 692–9'.

Table 1. The details of manipulations for the profiles
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Photograph	Detail of manipulations
1. Bimaxillary protrusion	Profiles with upper and lower lip protrusion created by anteriorly positioned upper and lower anterior alveolar segments, increased upper and lower incisal proclination and normal anteroposterior position of the mandible
2. Protrusive mandible	Profiles with anterior positioning of the mandible only
3. Retrusive mandible	Profiles with posterior positioning of the mandible only
4. Normal profile	Normal Chinese profile (skeletal I basal relationship and class I incisors with average normative cephalometric values) from which the other six profiles were derived
5. Retrusive maxilla	Profiles with posterior positioning of the maxilla only
6. Protrusive maxilla	Profiles with anterior positioning of the maxilla only
7. Bimaxillary retrusion	'Flatter' profiles with upright upper and lower incisors and less protrusive anterior alveolar segments to simulate White profile features

rank scores between the seven profiles was performed using Kruskal–Wallis test for male and female profiles respectively. The mean rank scores were used to determine the ranking of the profiles. The choice of the most attractive male and female profiles between age, ethnicity and gender were assessed using logistic regression. The odds ratio (OR) was reported with 95% confidence interval (CI). Statistical significance was set at P < 0.05.

Results

Table 2 shows the mean (SD) and median rank scores for male and female profiles. A comparison

	Male				Female			
Photograph	Mean	SD	Median	Ranking ^a	Mean	SD	Median	Ranking ^a
1. Bimaxillary protrusion	5.23	1.72	6	6	3.88	1.61	4	4
2. Protrusive mandible	6.04	1.59	7	7	5.82	1.51	6	7
3. Retrusive mandible	3.60	1.79	4	3	4.87	1.93	5	5
4. Normal profile	2.50	1.33	2	1	2.54	1.49	2	2
5. Retrusive maxilla	3.68	1.76	4	4	5.04	1.37	5	6
6. Protrusive maxilla	3.13	1.57	3	2	3.44	1.52	3	3
7. Bimaxillary retrusion	3.80	1.78	4	5	2.42	1.74	2	1

Table 2. Mean and median rank scores of male and female profiles

^aRanking of male and female profiles based on the mean rank scores.

of median rank scores revealed that the rank scores assigned were significantly different between the seven profiles for both male (P < 0.001) and female (P < 0.001) profiles.

Based on mean rank scores, the most preferred male profile was the normal profile. Male profile with protrusive mandible was ranked the least attractive. Bimaxillary retrusion (mean rank score of 2.42) and normal female profiles (mean rank score of 2.54) were ranked the most attractive. A female profile with protrusive mandible was ranked the least attractive.

There were no significant differences in age, ethnicity and gender's preference in choosing male normal profile as the most attractive profile (Table 3). However, adjusted analysis accounting for age, ethnicity and gender showed that older laypersons were significantly less likely to choose the normal male profile as the most attractive (OR: 0.89, 95% CI: 0.79–0.99). In choosing female bimaxillary retrusion or normal profile as the most attractive profile, age, ethnicity and gender did not influence the profile preferences for both unadjusted and adjusted analyses (Table 4).

Discussion

Asian adults perceived a Chinese profile based on a skeletal I jaw relationship and a protrusive mandiblular profile as the most and least attractive respectively. Collectively, both normal and bimaxillary retrusive Chinese profiles could be regarded as orthognathic profiles most esthetically pleasing to Asian adults. This finding was in agreement with previous studies conducted in Asian communities by Maganzini et al. (29) and Mantzikos (30). The preference for an orthognathic facial profile by Asians was similar to the findings of previous studies conducted in the Western communities (27–28, 31). The result demonstrated a possible cross-cultural effect on the perception of facial profile attractiveness.

A normal Chinese male profile was identified to be the best profile. This finding implied that a typical Chinese male profile with mildly protrusive lips was preferred over a bimaxillary retrusive male profile with a flatter lip profile. Thus given a choice between these two profiles, Asian laypersons would prefer a normal Chinese profile

Characteristic	Most attractive male profile (normal profile)		Unadjusted analysis		Adjusted analysis	
	Yes $(n = 38)$	No $(n = 111)$	P-value	OR (95% CI)	P-value	OR (95% CI)
Age (years)						
Mean (SD)	23.3 (3.2)	25.0 (4.7)	0.055	0.90 (0.81-1.00)	0.034	0.89 (0.79–0.99)
Median	23.0	23.0				
Range	19.0-33.0	19.0-41.0				
Race						
Chinese ^a	23 (60.5%)	74 (66.7%)				2.15 (0.89-5.20)
Malays	12 (31.6%)	20 (18.0%)	0.132	1.93 (0.82-4.54)	0.090	
Indians	3 (7.9%)	17 (15.3%)	0.398	0.57 (0.15-2.11)	0.335	0.52 (0.14-1.96)
Gender						
Female	29 (76.3%)	83 (74.8%)	0.850	1.09 (0.46-2.57)	0.840	0.91 (0.37-2.24)
Male ^a	9 (23.7%)	28 (25.2%)				

Table 3. Factors influencing laypersons' perception of choosing the most attractive male profile

^aReference group used in logistic regression analysis.

Characteristic	Most attractive fe bimaxillary retrus	male profile: sion/normal profile	Unadjuste	ed analysis	Adjusted analysis	
	Yes $(n = 107)$	No $(n = 42)$	<i>P</i> -value	OR (95% CI)	<i>P</i> -value	OR (95% CI)
Age (years)						
Mean (SD)	24.6 (4.5)	24.5 (4.1)	0.963	1.00 (0.92-1.09)	0.829	1.01 (0.93–1.10)
Median	23.0	23.0				
Range	19.0-40.0	20.0-41.0				
Race						
Chinese ^a	65 (61%)	32 (76%)				
Malays	27 (25%)	5 (12%)	0.066	2.66 (0.94-7.55)	0.066	2.69 (0.94-7.70)
Indians	15 (14%)	5 (12%)	0.486	1.48 (0.49-4.42)	0.473	1.50 (0.50-4.55)
Gender						
Female	84 (79%)	28 (67%)	0.135	1.83 (0.83-4.02)	0.126	1.89 (0.84-4.28)
Male ^a	23 (21%)	14 (33%)				

Table 4. Factors influencing laypersons' perception of choosing the most attractive female profile

^aReference group used in logistic regression analysis.

although both profiles could be equally acceptable from a professional viewpoint. This could have implications on managing facial esthetic expectations in Asian male patients.

Male profile with a protrusive maxilla was perceived to be the second most attractive profile indicating that a skeletal II Asian male profile was esthetically and socially acceptable. Male profile with retrusive mandible was ranked the third most attractive. This is an interesting finding because a skeletal II male profile was preferred over a bimaxillary retrusive profile. Moreover, a skeletal II profile was regarded as unattractive by White laypersons (28). This finding suggests a difference in the perception of facial attractiveness for skeletal II profiles between Asian and White laypersons. A bimaxillary protrusive male profile was ranked unattractive, but this finding was not in agreement with that of Maganzini et al. (29) and a probable explanation could be sociocultural differences between the two communities. A skeletal III male profile with a retrusive maxilla was ranked more attractive than one with a protrusive mandible. This suggests that mandibular prognathism was socially less acceptable than a retrognathic maxilla. It is interesting to note that the mean rank scores given to male profiles with retrusive mandible, retrusive maxilla and bimaxillary retrusion were very similar and ranked in the middle of the scale. The diverse perception of these three profiles reflected the highly subjective preferences of laypersons toward male profile attractiveness. It could also mean that these three profiles were perceived as neither attractive nor unattractive. Perhaps the laypersons were less certain of their judgments towards these profiles.

The most attractive female profiles chosen were bimaxillary retrusion and normal profile. This

finding concurred with the findings by Maganzini et al. (29). Thus the perception of an esthetically pleasing female profile by Asian and native Chinese adults was similar. The effects of western culture through global mass media would certainly play an influential role in the concept of a beautiful face perceived by Asian and Chinese communities. Female normal profile was never ranked as the least attractive profile by all the subjects suggesting that the perception of attractiveness for this particular profile was more consistent when compared with the others. A skeletal II female profile with a retrusive mandible was ranked less attractive than one with a protrusive maxilla. It would seem that the mandible was the key determinant in laypersons' perception of facial profile esthetics, which was also evident in skeletal III profile with protrusive mandible. The mean rank scores and ranking order indicated that bimaxillary protrusion in either male or female was perceived to be esthetically less favorable although this inherent facial profile is typically observed in Chinese.

Age, sex and ethnicity were found to be nonsignificant predictors in the assessment of the most attractive female profile. It could mean that the judgment of an attractive female profile was universal among both male and female laypersons of different ages and ethnic groups of this study sample. Gender and ethnicity were nonsignificant predictors in the assessment of the most attractive male profile. Although older adults were less likely to choose a normal male profile to be the most attractive, this finding should be interpreted in light of the marginal age difference and almost similar age range (Table 4). It would seem that the judgment of an attractive male profile might be affected by age. Perhaps the psychological and One of the limitations of the study was the under-representation of Chinese and over-representation of Malay subjects when compared with the population census (33) of June 2004 (Chinese 76%, Malay 14%). The proportion of Indians participants in the present study was consistent with the population census at 13.4%. The proportion of females in this study was also relatively higher than the population proportion (50.3%). In addition, all the participants had higher education. Thus only the opinions of a specific group of adults were studied. It would be of interest to investigate if the facial profile preferences of well-educated adults differ significantly from those of a lesser educational background.

Although the introduction of the bimaxillary retrusion profile in the assessment was meant to simulate a straight profile commonly observed in White subjects, it must be noted that the profiles were still recognizable as being Chinese. In addition, the non-Chinese Asian laypersons were not given non-Chinese facial profiles for assessment. A possible improvement in the research methodology for future studies would be the use of silhouette profiles instead of photographic images to control perception bias because of race recognition and stereotyping.

An important point to be raised from this study is that clinicians managing Chinese patients in Asian communities must take into consideration the differential facial profile preferences that are gender specific with an element of perceptual variation. In particular, this can impact the treatment approaches of clinicians who practice orthodontics. Thus it is important for clinicians to determine the facial profile preferences of Asian patients, their family members and friends, as both internal and external preferences will affect patients' satisfaction with facial profile changes produced by cosmetic treatment.

Conclusions

The study concluded that orthognathic Chinese male and female profiles were perceived to be the most attractive by Asian laypersons. A male orthognathic profile with normative Chinese cephalometric values was perceived to be more attractive than a 'flatter' bimaxillary retrusive profile. Both bimaxillary retrusion and normal Chinese female profiles were perceived to be the most attractive. A male or female profile with a protrusive mandible was judged to be the least attractive. Age, gender and ethnicity were nonsignificant predictors for the most attractive female profile. Older laypersons, independent of sex and ethnicity, might be less likely to choose normal male profile as the most attractive profile.

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