ORIGINAL ARTICLE

Facial profile preferences of black women before and after orthodontic treatment

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Introduction: The purposes of this study were to determine (1) profile preferences of black female patients and (2) whether they can recognize their own profile images before and after orthodontic treatment. **Methods:** Fifteen black orthodontists, 15 white orthodontists, and 15 black female patients were asked to indicate the images they considered most pleasing and to determine a zone of acceptability for 3 black female profiles. Raters used the PERCEPTOMETRICS computer program (Health Programs International, Wellesley, Mass). In addition, the 15 patients were asked to identify their most accurate pretreatment and posttreatment profile images. **Results:** Analyses of variance showed that the white orthodontists preferred flatter profiles than the black women, who in turn preferred fuller profiles than the black orthodontists. Significant differences in lip position were detected for most pleasing and midpoint of acceptability among the 3 groups of judges, with no significant differences in any variables measured between treatments in rating the 3 images. No significant differences were detected for the magnitude of the zone of acceptability. All 15 black women recalled having fuller profiles than they actually did before treatment, but they could correctly identify their own profile images after treatment. **Conclusions:** The results of this study will facilitate the understanding of the physical bases of the esthetic judgments of black and white orthodontists and black female patients. (Am J Orthod Dentofacial Orthop 2006;129:17-23)

In orthodontic terms, black patients are generally considered to be bimaxillary protrusive, a condition characterized by dentoalveolar flaring of the maxillary and mandibular teeth with compensatory protrusion of the lips and convexity of the face. According to Farrow et al,[1] the esthetic goals for orthodontic treatment of black patients remain to be determined by analyzing the bases of the holistic views of attractiveness. Alternatively, "how much physical change must there be in a particular feature before the Gestalt of an acceptable, attractive, or beautiful face is rejected. Or conversely, how much change in shape or size of an unattractive feature before an acceptable Gestalt is achieved."[2]

Beauty has traditionally been thought to be in the eye of the beholder,[3] and this allows for great variability among laypeople in judgments of pleasing faces and among practitioners when developing individualized treatment plans. Studies have shown judgment differences due to ethnic background,[1,4-8] and between laypeople and orthodontists,[1,6,8-12] regarding concepts of beauty. Consequently, there might be uncertainty in the minds of some orthodontists about their ability to evaluate black profiles and relate their own profile preferences to the patient's esthetic values.[13]

How patients perceive themselves in profile and frontal views should also be addressed. According to Pitt and Korabik,[14] patients are somewhat able to identify deviations in others, but they are far from accurate in evaluating themselves, unless they perceive a problem with their facial esthetics.[15] Consequently, patients might not be able to recognize changes in their appearance after treatment, particularly in profile view.

The goals of this study were to determine (1) whether black orthodontists (BO), white orthodontists (WO), and black female patients (BFP) differ in their preferences for black female facial profiles, and (2) whether BFP can recognize their own pretreatment and posttreatment profiles.

To assist in doctor-patient communication during diagnosis and treatment planning, the PERCEPTOMETRICS computer software (Health Programs International, Wellesley, Mass) was developed to allow the operator to animate a series of images on the screen, similar to a motion picture. This method provides a dynamic range rather than a single point of acceptable change.[16,17] This dynamic range allows the patient,

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Fig. Images from pretreatment (*top row*) and posttreatment (*bottom row*) movies. *Left,* frame 0 (extreme R position); center, frame 21 (unaltered position); right, frame 42 (extreme P position).

regardless of previous knowledge of potential orthodontic outcomes, and the orthodontist, regardless of race, to communicate by comparing the achievable profile range with what the patient considers pleasing.

MATERIAL AND METHODS

After obtaining institutional human studies approval and informed consents from the patients, we took color photographs of 15 black women, standardized for distance, before and after orthodontic treatment and scanned them with a Sprint Scan 35 (Polaroid, Waltham, Mass). The images were adjusted to remove distractions, such as shadows and stray hairs, with Adobe Photoshop 5.0 (Adobe Systems, San Jose, Calif). By using the morphing software PERCEPTOMETRICS,[2,10,16,17] the area from subnasale to supramentale, the region equivalent to the bimaxillary protrusion area commonly seen in blacks, was morphed continuously between retrusive (R) and protrusive (P) extremes. A series of 21 sequential frames was generated between the unaltered image and the R extreme and another series of 21 frames between the unaltered image and the P extreme, to create 43 frames that were merged to produce a movie. In each morphing sequence from unaltered to extreme, the increment between the frames was constant.

A sample size of 17 was determined to be necessary to detect an expected mean difference of the same magnitude as the standard deviation between any 2 of the 3 groups in the study with a power of 80% (2-sided alternative, Type 1 error = 0.05). Because it was difficult to find that many black judges, a convenience sample of 15 was obtained in each group. The BO (10 men, 5 women) were recruited from private practices. The WO (13 men, 2 women) and the patients were recruited primarily from a university-based orthodontic department. The age distribution was 44.9 ± 11.6 for the BO, 50.9 ± 14.4 for the WO, and 36.1 ± 9.8 for the BFP. Patients were chosen who had Class I malocclusions (based on first-molar relationship) with varying