

Effect of buccolingual inclinations of maxillary canines and premolars on perceived smile attractiveness

Hui Xu,^a Xianglong Han,^b Yanmin Wang,^c Rui Shu,^a Yan Jing,^a Ye Tian,^a Will A. Andrews,^d Lawrence F. Andrews,^e and Ding Bai^f

Chengdu, China, San Francisco, Calif, and Morgantown, WVa

Introduction: In this study, we aimed to investigate the effect of buccolingual inclinations of the maxillary canines and premolars on the perceived attractiveness of the smile when viewed from the frontal perspective.

Methods: A smiling frontal photograph was taken of a man. A 3-dimensional digital dental model of this subject was constructed within which the buccolingual inclinations of the canines and premolars could be altered relative to the occlusal plane. Three-dimensional models of the altered digital models were then printed in resin and mounted on articulators. Frontal photos of the mounted models were taken and transferred to the smile image. A series of images was produced with the canines and premolars inclined buccally or lingually by different degrees. The smile images were assessed by 2 panels, orthodontists and laypeople. **Results:** There was a broad range of esthetic acceptability for the buccolingual inclinations of the maxillary canines and premolars. The range of preferred inclinations was not as broad. Smile esthetics was significantly compromised ($P < 0.01$) when the canines were lingually inclined more than -12° , or the premolars were lingually inclined more than -15° , as perceived by orthodontists and laypersons. Buccally tipping the canines more than 6° also made the smile esthetics less satisfying ($P < 0.01$). **Conclusions:** It could be esthetically satisfying to position the teeth within the ranges of 0° to -7° of inclination for the canines and -3° to -11° of inclination for the premolars, as assessed by the orthodontists, or of 3° to -10° of inclination for the canines and 5° to -11° of inclination for the premolars, as assessed by the laypersons. Clinicians could exercise flexibility within this range, when compromising tooth positions for transverse jaw discrepancies. (Am J Orthod Dentofacial Orthop 2015;147:182-9)

^aPostgraduate student, Department of Orthodontics, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

^bAssociate professor, Department of Orthodontics, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

^cLecturer, Department of Orthodontics, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

^dAssistant clinical professor, Department of Orthodontics, University of California at San Francisco; private practice, San Diego, Calif.

^eAdjunct professor, Department of Orthodontics, West Virginia University, Morgantown, WVa.

^fProfessor and chair, Departments of Orthodontics and Paediatrics, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, Chengdu, China.

All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

Funded by the Science and Technology Plan Project of Sichuan Province (grant 14ZC2479).

Address correspondence to: Ding Bai, Departments of Orthodontics and Paediatrics, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, 14#, 3rd section of Renmin South Road, Chengdu 610041, P. R. China; e-mail, baiding@scu.edu.cn.

Submitted, July 2014; revised and accepted, October 2014.

0889-5406/\$36.00

Copyright © 2015 by the American Association of Orthodontists.

<http://dx.doi.org/10.1016/j.ajodo.2014.10.029>

An attractive smile is an important aspect of facial appearance.¹⁻⁸ Researchers have conducted extensive studies on the impact of various aspects of smile attractiveness including buccal corridor spaces, arch widths, smile arcs, midline deviations, gingival displays, occlusal plane inclinations, and facial measurements.¹⁻¹⁴ Recently, the buccolingual inclination of the posterior teeth has been recognized as an important aspect of both occlusion and smile attractiveness.⁹ A full, broad smile with minimal buccal corridor space has been deemed by some to be a preferred esthetic feature.¹⁻³ Zachrisson⁹ stated that lingually inclined posterior teeth would increase the negative corridor and consequently decrease the smile fullness and attractiveness.

There are some deficiencies in studies regarding the impact of buccolingual inclinations of the maxillary posterior teeth on perceived attractiveness, resulting in conflicting findings.¹⁻⁸ Previous researchers have failed to separately evaluate the esthetic effect of buccolingual inclinations of posterior teeth and the effect of

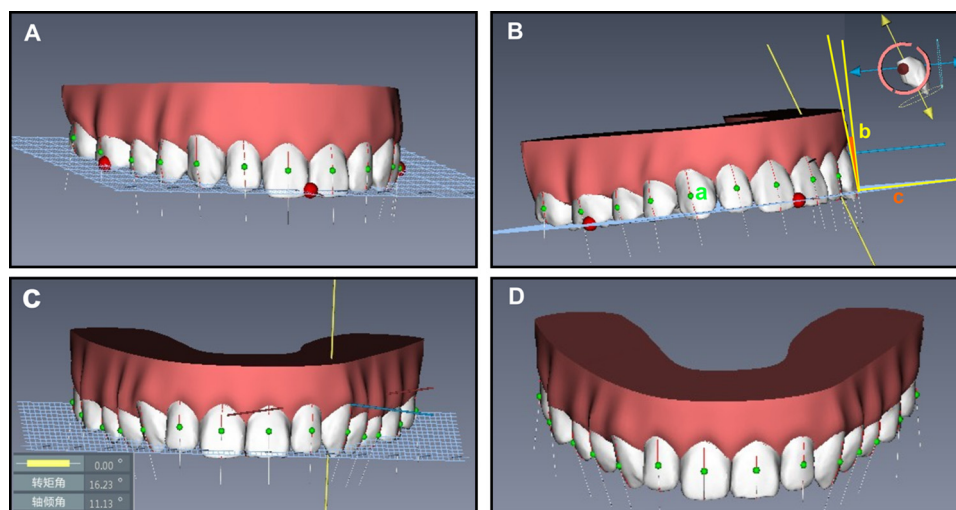


Fig 1. The 3D digital dental model was constructed and manipulated using the OrthoRX software: **A**, the occlusal plane was formed by the bisection of the vertical overlap of the incisal edges of the maxillary and mandibular incisors and the bisection of the vertical overlap of the anterior cusp tips of the mandibular and maxillary first molars; **B**, The facial-axis point (*b*) was marked, and the angular inclination of the canine (*a*) was measured relative to the occlusal plane (*c*); **C**, the inclinations of the teeth were altered one by one; **D**, the digital model with a -16° inclination of the canines and a -19° inclination of the premolars.

negative buccal corridor spaces, since these 2 factors were coupled together in the study designs.^{2,3,6,8} Also, attention has been focused on the tilting of the posterior teeth in the frontal smile⁹ and the incisors for the profile smile,^{15,16} but the inclinations of the canines and premolars were omitted. The maxillary canine could be of prime importance in smile esthetics because of its location on the corner of the dental arch, joining the anterior and lateral segments of the teeth. Conclusions reached in previous studies were arrived at by digitally altering the positions of teeth on photographs, without knowing the exact angular inclination of the teeth relative to the occlusal plane in actual situations; thus, these studies could not provide detailed principles that can be systematically applied to clinical practice.^{2,3,5}

The term “inclination of teeth” was described in the 6 keys of normal occlusion,¹⁷ and ideal norms were set for buccolingual inclinations.¹⁸ In “Six elements of orofacial harmony” by Andrews,¹⁹ it is suggested that the root of each tooth should be centered between the faciolingual borders of the basal bone, and that each crown should be inclined so that it can interface fully and function gnathologically. In practical situations, dentoalveolar transverse compensation is often needed because of skeletal transverse discrepancies. The borders of the basal bone provide limitations for transverse tooth movement, in consideration of health and stability. In such conditions,

the inclinations of the teeth should be a compromise from the published norms. For patients who seek orthodontic therapy, much attention is often paid to enhancing dentofacial esthetics rather than improving occlusal relationships. This calls for further research on the range of what might be considered esthetically acceptable regarding the buccolingual inclinations of teeth, as perceived by laypersons and dental professionals. Such research could help define the boundaries for transverse dental compensation when there are jaw discrepancies.

In this study, we hypothesized that there might be a range of esthetic acceptability for the buccolingual inclinations of the maxillary canines and premolars from a frontal view of the smile. We performed this study to investigate the effect of buccolingual inclinations of the maxillary canines and premolars on the perceived attractiveness of a frontal smile.

MATERIAL AND METHODS

This study was carried out in 3 steps. In the first step, a 3-dimensional digital dental model was constructed, and alterations were made in the buccolingual inclinations of the selected maxillary teeth (Fig 1). Second, photographic manipulations were performed so that the altered inclinations of the teeth could later be transferred from mounted maxillary models to the frontal view of the smile (Fig 2). Finally, the 15 frontal smile

Download English Version:

<https://daneshyari.com/en/article/3116077>

Download Persian Version:

<https://daneshyari.com/article/3116077>

[Daneshyari.com](https://daneshyari.com)