รูปด้านข้างของใบหน้าที่ยอมรับได้ในผู้ป่วยจัดฟันไทยที่มีรูปด้านข้างของใบหน้าผิดปรกติ

นางสาว เพกา จรุงกิจอนันต์

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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ปีการศึกษา 2550

ACCEPTABLE FACIAL PROFILES IN THAI NON-STRAIGHT PROFILE PATIENTS

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A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science Program in Orthodontics

Department of Orthodontics

Faculty of Dentistry

Chulalongkorn University

Academic Year 2007

Thesis Title	ACCEPTABLE FACIAL PROFILES IN THAI NON-STRAIGHT PROFILE PATIENTS
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Field of Study	Orthodontics
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เพกา จรุงกิจอนันต์ : รูปด้านข้างของใบหน้าที่ยอมรับได้ในผู้ป่วยจัดฟันไทยที่มีรูปด้านข้างของใบหน้าผิดปรกติ. (ACCEPTABLE FACIAL PROFILES IN THAI NON-STRAIGHT PROFILE PATIENTS) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ทพ.กนก สรเทศน์, 59 หน้า.

วัตถุประสงค์: เพื่อศึกษาหารูปด้านข้างของใบหน้าที่ยอมรับได้ในผู้ป่วยจัดฟันไทยที่มีรูปด้านข้างของใบหน้าผิดปรกติ โดยศึกษารวมถึงเพศที่แตกต่างกันของผู้ป่วย และเพศของรูปด้านข้างที่ประเมินว่ามีผลต่อใบหน้าที่ยอมรับได้หรือไม่ และศึกษากลุ่มทันตแพทย์จัดฟันว่าแตกต่างจากกลุ่มผู้ป่วยหรือไม่

วัสดุและวิธีการ: นำภาพถ่ายรังสีกะโหลกด้านข้างของผู้ป่วยมาลอกส่วนเนื้อเยื่ออ่อน กำหนดจุดเนื้อเยื่ออ่อน (G, A, Pg') และวัดค่าเฟเชียลคอนทัวร์แองเกิล (facial contour angle, FCA) เพื่อเลือกกลุ่มตัวอย่างห้าสิบแปดคนด้วยวิธีการสุ่มตัวอย่างแบบเจาะจงโดยแบ่งออกเป็นสามกลุ่มคือใบหน้า แบบตรง แบบนูนและแบบเว้า ตามค่าปรกติของ FCA ของคนไทย ทันตแพทย์จัดฟันสิบเก้าคนเป็นกลุ่มมาตรฐาน สร้างรูปด้านข้างของใบหน้าและเปลี่ยนแปลงโดยโปรแกรมคอมพิวเตอร์ เฟซเจน โมเดลเลอร์ 3.1.2 ออกมาแปดรูป แยกเป็นเพศชายและหญิง สองรูปเป็นรูปด้านข้างของใบหน้าแบบตรง อีกหกรูปเป็นรูปด้านข้างของใบหน้าแบบเว้าและค่อยๆลด FCA จนเป็นแบบเว้าที่สุด และอีกหกรูปเป็นรูปด้านข้างของใบหน้าแบบนูน และค่อยๆเพิ่ม FCA จนเป็นแบบนูนมากที่สุด นำมาเรียงสลับกัน แยกเป็นรูปด้านข้างของใบหน้าเพศชายแบบเว้า รูปด้านข้างของใบหน้าเพศชายแบบนูน รูปด้านข้างของใบหน้าเพศหญิงแบบเว้า และรูปด้านข้างของใบหน้าเพศหญิงแบบนูน ให้กลุ่มตัวอย่างเลือกรูปด้านข้างของใบหน้าที่ยอมรับได้กี่รูปก็ได้ และให้ประเมินรูปด้านข้างของใบหน้าของตนเองด้วย ความถี่ของการเลือกรูปแต่ละรูปถูกนำมาคำนวณทางสถิติ

ผลการศึกษา: รูปด้านข้างของใบหน้าแบบตรงถูกเลือกมากที่สุด รูปด้านข้างของใบหน้าแบบนูนจะยอมรับได้มากกว่าแบบเว้าถ้าเบี่ยงเบนออกจากค่าปรกติในระดับเท่าๆกันทั้งในกลุ่มคนไข้และทันตแพทย์จัดฟัน กลุ่มตัวอย่างที่มีรูปด้านข้างของใบหน้าแบบนูนจะยอมรับรูปด้านข้างของใบหน้าแบบนูนเท่ากับหรือมากกว่ากลุ่มตัวอย่างที่มีรูปด้านข้างของใบหน้าแบบอื่น ในขณะที่กลุ่มตัวอย่างที่มีรูปด้านข้างของใบหน้าแบบเว้ามีแนวโน้มที่จะไม่ยอมรับรูปด้านข้างของใบหน้าแบบเว้ามาก รูปด้านข้างของใบหน้าของเพศชายที่ผิดปรกติจะเป็นที่ยอมรับได้มากกว่าเพศหญิง กลุ่มตัวอย่างเพศชายยอมรับรูปด้านข้างของใบหน้าแบบเว้ามากได้มากกว่ากลุ่มตัวอย่างเพศหญิง กลุ่มตัวอย่างที่มีรูปด้านข้างของใบหน้าผิดปรกติจะสามารถประเมินรูปด้านข้างของใบหน้าของตนเองได้แม่นยำกว่ากลุ่มที่มีรูปด้านข้างของใบหน้าแบบปรกติ

สรุป: รูปด้านข้างของใบหน้าที่ยอมรับได้ในกลุ่มตัวอย่างที่มีรูปด้านข้างของใบหน้าแบบตรง นูนและเว้านั้นแตกต่างกัน โดยรวมแล้วผู้ป่วยและทันตแพทย์จัดฟันมีแนวโน้มในการยอมรับรูปด้านข้างของใบหน้าไปในทิศทางเดียวกัน เพศของผู้ป่วย และเพศของรูปด้านข้างของใบหน้ามีผลต่อรูปด้านข้างของใบหน้าที่ยอมรับได้

ภาควิชา ทันตกรรมจัดฟัน ลายมือชื่อนิสิต.....Paga J.....

สาขาวิชา ทันตกรรมจัดฟัน ลายมือชื่ออาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก.....Kanok Sorat.....

ปีการศึกษา 2550

4976133332 : MAJOR ORTHODONTICS

KEY WORD: ACCEPTABLE FACIAL PROFILES / FACIAL CONTOUR ANGLE / FACIAL PROFILE PREFERENCES

PAEGA JARUNGIDANAN : ACCEPTABLE FACIAL PROFILES IN THAI NON-STRAIGHT PROFILE PATIENTS.THESIS PRINCIPAL ADVISOR : ASST. PROF. KANOK SORATHESN, 59 pp.

Objective: This study aimed to determine the acceptable facial profiles in non-straight profile patients. Gender difference was also considered to have an effect on the profiles. Orthodontists were also asked to find out the possible differences in patients' facial profile preferences.

Materials and Methods: The patients' pre-treatment lateral cephalometric radiographs were traced. Soft tissue landmarks (G, A, Pg') were marked and facial contour angles (FCA) were measured. Fifty-eight patients were selected by a purposive sampling method and divided into 3 groups: concave, straight, and convex profiles according to Thai norms. Nineteen orthodontists were included in this study as the gold standard group. FaceGen Modeller 3.1.2® software was used to create the facial profile distortion. Eight constructed facial profiles of each sex were presented - 2 straight profiles and the other 6 facial profiles starting from decreased FCA to the most concave profile and vice versa, arranged in random order. As a result, the acceptable facial profile evaluation of the questionnaire comprised 4 pages: male concave profiles, male convex profiles, female concave profiles and female convex profiles. The subjects were asked to choose as many "acceptable facial profiles" as they wished. The subjects were also asked to evaluate their facial profiles. The frequency of each selected profile was used in the calculations.

Results: The straight profile was the most popular facial profile and convex profiles were more acceptable than concave profiles if there was equal deviation from the straight profile for both subjects and orthodontists. Convex profile subjects accepted convex profiles equally or more than any other profile subjects while concave profile subjects tended not to accept severe concave profiles. Male profiles were more acceptable if deviating from normal. Male subjects could accept the severe concave profiles more than females. Non-straight profile subjects could assess themselves more accurately than those with straight profiles.

Conclusion: The acceptable facial profiles of straight, convex and concave profile subjects were different. Overall, patients' acceptable profiles showed the same trend with orthodontists. The gender of the subject and of the facial profile affected what was considered an acceptable profile.

Department	Orthodontics	Student's signature Paega J.
Field of study	Orthodontics	Principal Advisor's signature Kanok Sorat
Academic year	2007	

Acknowledgements

This thesis would not have been possible without the support of many people. First, I would like to thank Asst. Prof. Kanok Sorathesn for his dedication to my thesis. Second, I also wish to express my appreciations to committee members for their guidance and support. Third, I would like to thank Department of Orthodontics, Faculty of Dentistry, Chulalongkorn University for unconditional support. I have furthermore to thank Ajarn Paipan Phitayanon, not only for statistic consultation but also her guidance in research methodology. To patients and orthodontists who voluntarily participated in this study, I am thankful for their valuable contributions.

Last but not least, I would like to give my special thanks to my parents whose supports enable me to complete my work.

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CHAPTER I
INTRODUCTION

Background and Rationale

The objectives of orthodontic treatment are to achieve optimal facial harmony consistent with maximum functional occlusion within the limitations of therapy. (Burstone, 1958) The diagnosis and treatment planning and treatment execution are the steps involved to success of orthodontic treatment.(Arnett and Bergman, 1993b)

After the advent of cephalometric radiography, cephalometric analysis has been used as the standard because of the ease of procuring, measuring and comparing (superimposition) hard tissue structure and the belief that treating cephalometric hard tissue norms results in a pleasing face. Because of these advantages, the diagnosis and treatment plan was based heavily on cephalometry.(Arnett and Bergman, 1993b)

However, reliance on cephalometric analysis and treatment planning sometimes leads to esthetic problems. (Holdaway, 1983; Holdaway, 1984) Many authors have created soft tissue analysis with normative values which are applicable to clinical practice.(Arnett and Bergman, 1993a; Arnett and Bergman, 1993b; Burstone, 1958; Holdaway, 1983; Holdaway, 1984)

Esthetics is not measured or perceived in the same way by everyone. As a result, there have been a variety of studies on esthetic perception and preferences which have employed differing methodologies The objectives of orthodontic treatment are to achieve optimal facial harmony consistent with maximum functional occlusion within the limitations of therapy .

The various occupational backgrounds of subjects has been considered to be one factor affecting facial profile preferences from laypeople to dental professions (Coleman *et al.*, 2007), orthodontists to oral surgeons (Bell *et al.*, 1985; Soh *et al.*, 2005a), as well as different ages, different races (Hall *et al.*, 2000; Hwang *et al.*, 2002), and different genders. (Coleman *et al.*, 2007)

Bell *et al.*, 1985, studied 80 patients who had previously been evaluated by an oral surgeon and an orthodontist as requiring orthognathic surgery. Half of them decided against surgery and were more likely to rate themselves as “ideal” or within the normal range of the

rating scale than the other half who opted for surgery. Is it possible that patients, who have facial deformity and who are advised to undergo orthognathic surgery, may not perceive themselves as orthodontists do?

Subject's facial profile has rarely been considered a factor affecting facial profile preference. Türkkahraman and Gökalp, 2004, considered the raters' personal profile as a factor affecting profile preference and concluded that the rater's personal profile had little effect on one's esthetic preferences. However, the raters' personal profiles were determined only by a visual examination conducted by the authors.

This study aimed to determine the acceptable facial profiles of non-straight profile patients. The result of this study could be used as an aid in treatment plans.

Research questions

1. Does the acceptable convex profile in convex and concave profile patients differ from normal profile patients?
2. Does the acceptable concave profile in convex and concave profile patients differ from normal profile patients?
3. Does sexual dimorphism affect facial profile acceptability?
4. Are the acceptable profiles of each gender different in each group?
5. Is a patient's self perception reliable?

Research hypothesis

1. Concave and convex profile patients accept the convex profile differently and differ from normal profile patients.
2. Concave and convex profile patients accept the concave profile differently and differ from normal profile patients.
3. The genders of the subjects and objects affect facial profile acceptability.
4. A patient's self perception is reliable.

Assumptions

1. Convex, straight and concave profiles are determined by the facial contour angle (FCA) altering at the soft tissue pogonion (Pg') regardless of occlusion because this study focused on soft tissue profile.

2. Modification of the face was done by FaceGen Modeller® 3.1.2 Singular Inversion Inc.
    a. Only chin pronounced/recessed slider was modified on the profile view but it affected several others, such as vertical deformities, to produce statistical validity of the face according to the manufacturer.
    b. Chin wide/thin slider was adjusted in the frontal view to make a realistic face according to the examiner.
    c. The faces that had already been modified were referred to as constructed facial profiles

3. Thai patients were defined as patients:
    a. who were born and reside in Thailand
    b. who are of Thai nationality
    c. whose parents were Thai and who have been living in Thailand for at least 1 generation.

4. Subjects' cephalometric radiographs were taken with Planmega® Proscan, and Kodak® 8000C. The positions of the subjects were determined by the technician. The subjects were in centric occlusion, with a cephalostat holding their heads and with relaxed lips.

5. The sensitivity of the measurement of FCA was 0.5 degree.

Operational definition

1. *An acceptable facial profile*

The term acceptable facial profile was defined as the facial profile which was the least acceptable to the subject. The acceptable facial profile might not be beautiful or ideal according to the subject's standard but it required no treatment or further corrections.

2. *Soft tissue landmarks and facial contour angle (FCA)*

Soft tissue landmarks were defined as Legan and Burstone, 1980. (Figure 1)

Frontal point (G) The most prominent point in the midsagittal plane of the forehead

Subnasale (Sn) The point at which the nasal septum between the nostrils merges with the upper cutaneous lip in the midsagittal plane

Soft tissue pogonion (Pg') The most prominent or anterior point on the chin, in the midsagittal plane

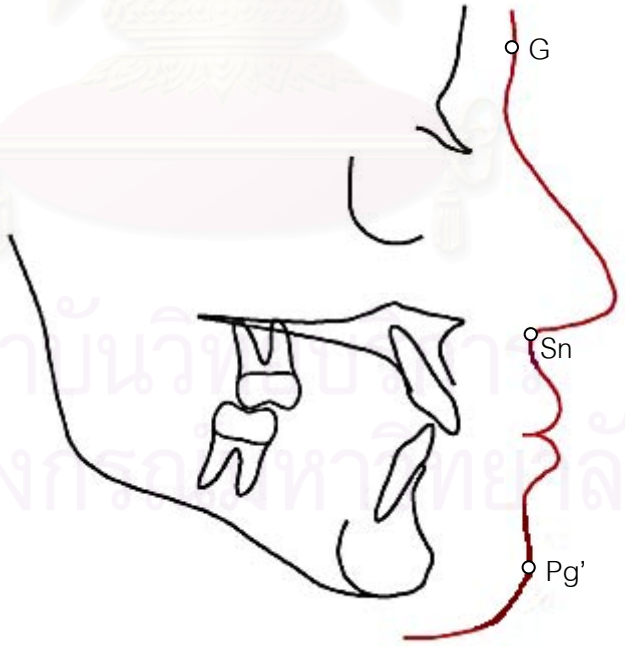


Figure 1 shows cephalometric landmarks

- FCA was measured as shown in Figure 2.

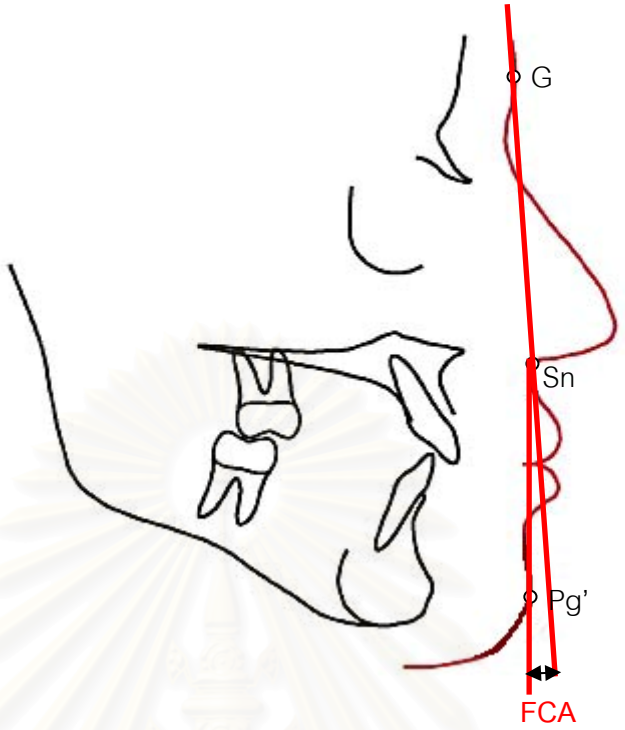


Figure 2 shows measurement of angle of facial convexity or facial contour angle (G-Sn-Pg')

The FCA was measured at 0.5 degree sensitivity.

3. *Concave, straight, and convex profiles*

These profiles were defined by FCA according to Thai norms. (Sorathesn, 1988)

Concave	male < 5°	, female < 4°
Straight	male 5-13°	, female 4-14°
Convex	male >13°	, female >14°

4. *Non-straight profile patients*

Non-straight profile patients were defined as patients whose profiles were concave or convex, according to their FCA.

Limitations

1. The esthetic perception was multifactorial. This study aimed to determine only the soft tissue profile as a factor. Confounding factors were controlled. The real acceptable profile might vary due to other facial profile features. (Coleman *et al*., 2007)
2. The facial profiles were modified according to the computer software mentioned previously. The depiction of the profiles might not be realistically accurate. If the mandible is in the correct position but the maxilla is not or there is a vertical discrepancy, these can also create facial deformities.
3. Even though the measurement from cephalometric radiographs have advantages over other techniques, there are some limitations:
    - Radiographic images are not true, but show varying degrees of enlargement and distortion.
    - Landmarks, even those most easily visible, are difficult to identify. (Burstone, 1958)
4. Due to the limitation of the number of subjects, the purposive sampling technique was used in this study; as a result, the subjects might not reflect actual Thai non-straight profile patients.
5. Subjects' backgrounds were based only on interviews.

Benefits of the study

The esthetics of the facial profile affect diagnosis and treatment planning. An unrealistic treatment plan can be avoided by a patient's profile preference (Giddon *et al*., 1996).

A study by Hwang *et al*., 2002, showed the ethnic differences in the facial profiles of Korean and European-American adults with normal occlusions and well balanced faces. These differences between ethnic groups should be taken into consideration when treatment plans are carried out on patients of different ethnic backgrounds. This may applied to patients with different preferences or an acceptable range of facial profiles, which should also be taken into account.

For example, an orthodontist might be of the professional opinion that a patient with concave profile should undergo orthognathic surgery. If the patient's acceptable profile has been assessed, the treatment plan might change into the compromised one.

CHAPTER II

LITERATURE REVIEW

The inadequacy of hard tissue analysis being used alone has been stated by many authors. (Burstone, 1958; Burstone, 2007; Holdaway, 1983; Holdaway, 1984) Relying on cephalometric analysis in treatment planning sometimes leads to esthetic problems. (Holdaway, 1983; Holdaway, 1984)

Studies about facial form have looked at the face from two planes.

1. *frontal* Studies on the frontal view have mostly been about smile esthetics such as the smile arc, buccal corridor or midline shift.(Burstone, 2007; Kokich *et al*., 2006)
2. *sagittal* The midsagittal plane produces an outline which is commonly referred to as the profile. Many dentofacial malformations as well as therapy changes are more evident when viewed from this plane. (Burstone, 1958)

The soft tissue analysis

The soft tissue profile is important because of its effect upon esthetics and its influence upon the denture. Forces from musculature, both passively and actively affect the position of the teeth in the stability of the case. (Downs, 1955)

It is widely accepted that orthodontic tooth movements can alter esthetics. Orthodontists can make the profile better or worse. Camouflage treatment for mild to moderate skeletal Class II problems can be done with reasonable esthetic outcomes. Camouflage treatment for Class III malocclusion can be successful if the skeletal discrepancy is mild. Retracting lower incisors will create more chin prominence and worsen the esthetic outcome.(Proffit, 2000)

Some analyses includes soft tissue analysis as well as hard tissue. Soft tissue analysis usually consists of the analysis of the face from the profile view because a facial profile is an important factor of facial profile esthetics. Orthodontic treatment alone or with orthognathic surgery can alter the facial profile of the patient.

Edward H. Angle's work, over a century ago, demonstrated malocclusion related to facial deformity.(Angle, 1899) A facial profile can be divided into 3 types – convex, straight and concave. Profile convexity or concavity results from the disproportionate size of the jaws but does not indicate which jaw is at fault. (Legan and Burstone, 1980; Proffit, 2000)

1. A convex profile indicates a Class II jaw relationship, which can result from either a maxilla position being too far forward or a mandible too far back.(Proffit, 2000) Vertical maxillary excess also produces a convex profile. (Arnett and Bergman, 1993a)
2. Straight profile indicates a Class I jaw relationship.
3. Concave profile indicates a Class III jaw relationship, which can result from a maxilla position being too far back or a mandible too far forward. (Proffit, 2000) Vertical maxillary deficiency also produces a concave profile. (Arnett and Bergman, 1993a)

(Ricketts, 1981), examined the distance from the lower lip to the esthetic plane (E line). The upper and lower lip should lie slightly behind the E line with the lower lip closer to it. Ricketts also considered racial differences.

Holdaway, 1983, preferred a soft-tissue facial angle to express mandibular prominence to SNB, not only because of both bony and soft-tissue chin variables but also because both Sella and Nasion could vary in high or low placement. Holdaway concluded the ideal face as having an H-angle of 7° to 15° dictated by the patient's skeletal convexity. He demonstrated 3 ideal cases in which the soft tissue profile related to basic skeletal convexity. The H angle increased in each of these cases as it went from a concave to a convex skeletal pattern. Some cases presented variations in the thickness of the soft tissue and this should be recognized.

Arnett and Bergman, 1993a, analyzed soft tissue from the frontal view and profile view in the natural head position (NHP). For the profile view, the profile angle was measured by connecting points Glabella (G'), Subnasale (Sn) and soft tissue Pogonion (Pg'). The angle was measured on the left hand side with the patient facing right. The profile angle appraised the general harmony of the forehead, midface and the lower face. This was the most important key to assess the need for anteroposterior surgical correction.

Legan and Burstone, 1980, developed a soft tissue cephalometric analysis for patients who require surgical-orthodontic treatment. The analysis was reduced to its most

relevant and significant measurements in order to make it clinically practical. Legan and Burstone used a horizontal reference plane (HP) constructed by drawing a line through the nasion 7 degrees up from the sella (S) – nasion (N) line. The analysis was composed of 2 parts – the facial form and lip position and form. The facial form was an analysis used to describe the overall horizontal soft tissue profile of the patient.

Measurement of the soft tissue might be taken directly from the living patients but soft-tissue flexibility affects the accuracy. Oriented photographs, if reduced in size or if midline structures are masked by more laterally lying ones, are not reliable. The lateral cephalometric radiographs, on the other hand, are permanent records, approximately life size and easy to obtain. (Burstone, 1958)

There are four parameters employed in conventional cephalometric analysis (McIntyre and Mossey, 2003):

1. Linear distance measurements between two landmarks.
2. Angles, calculated from triplicate measurement of landmarks. Although the size of angles varies with the relative spatial location of the landmark, they are size independent.
3. Areas of triangles can be measured and summed, e.g. the maxillary area on lateral cephalograms.
4. Ratios: usually of linear distance measurement.

The soft tissue measurements are usually the angular ones. They have advantages over linear measurements because if 1°-15° head rotation occurs, the angular measurements show less than 1% difference at all rotational angles regardless of the direction of rotation. (Yoon *et al.*, 2001)

The facial profile and esthetic

Esthetic in facial profiles is important in many ways. To the patients, dentofacial deformity affects the lives of individuals in many ways.(Lee *et al.*, 2007) To the dentists, specifically the orthodontist, esthetic in facial profile affects the diagnosis and treatment planning. A patient's profile preference can avoid an unrealistic treatment plan being presented (Giddon *et al*., 1996). The H angle which is the basic skeletal convexity of a face and sulcus dept measurements can be used as a guide in planning the anteroposterior

position of the denture to give proper lip support and a natural unstrained drape of the soft tissue covering the denture area of the face.(Holdaway, 1983)

Study method in facial profile preferences

Facial profile constructions

Studies of facial profile have used various methods to construct images such as computer-modified photographs (Maple *et al.*, 2005; Soh *et al.*, 2005a; Soh *et al.*, 2005b; Soh *et al.*, 2007), computer software to create new images (Spyropoulos and Halazonetis, 2001) or simple methods such as silhouettes (Czarnecki *et al.*, 1993; Hall *et al.*, 2000; Ioi *et al.*, 2005; Johnston *et al.*, 2005; Montini *et al.*, 2007; Orsini *et al.*, 2006).

Soh *et al.*, 2005a; Soh *et al.*, 2005b; Soh *et al.*, 2007, used facial profile photographs and a lateral cephalometric radiograph of a Chinese male and female adult with a normal profile and a Class I incisor and skeletal relationship and digitized them 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. Different groups of people were asked to rank the profiles of each gender on a scale of 1 (very attractive) to 7 (least attractive). The authors suggested that further studies should use a silhouetted profile instead of photographic images to control perception bias of race recognition and stereotyping (Soh *et al.*, 2007). However, this method relies on the subject's imagination (Coleman *et al.*, 2007).

Giddon *et al.*, 1996, used computer software [TrueVision Image Processing Software (TIPS; Indianapolis, Ind: Truevision, Inc., 1992)] to make profile soft tissue distortions of five components of the lower third of the face; the upper lip, bimaxillary position, chin, mandible, and lower face height. Color and blending were adjusted to provide as natural an appearance as possible to minimize distracting discontinuities between discrete distortions.

Spyropoulos and Halazonetis, 2001, used pretreatment color profile facial photographs of 20 female patients. The photographs were scanned, and the soft tissue outlines were digitized. The average outline of the 20 original photographs was then

calculated and used as a template for modifying the photographs with computer warping methods (to produce an image that differs from the original in shape only). This resulted in 20 warped photographs, all with the same soft tissue outline. Three additional photographs were constructed with the morphing method (the blending of 2 or more images together to produce a final image that differs from the original), the 1 face-the composite average of the 20 original photographs-and 3 hairstyles from 3 of the original pictures. The modified photographs were given higher scores than their original counterparts, showing that facial attractiveness is influenced by soft tissue outline form. However, the score improvement was not sufficient to reach the level of the composite images, especially for faces initially judged as being unattractive. This shows that factors other than profile outline shape may be more influential in facial esthetics such as virtual texture of the skin, the color and shape of eyes and lips, hairstyles. Spyropoulos and Halazonetis also stated that studies of facial profile attractiveness using the profile outlines from silhouettes can eliminate these distractions. Their concluded along the same lines of Foster, 1973, that silhouettes have the advantage of reducing the variables by eliminating the distraction of the hairline, the cheek, the complexion and the shape of the eyes.

Johnston *et al*., 2005, had 102 social science students rate the attractiveness of the facial profile using a series of silhouettes with normal, Class II and Class III profiles. However, the hard tissue parameters (SNB) were used to produce these silhouettes so they might not reflect real soft tissue profiles.

Questioning methods

Giddon *et al*., 1996; Giddon *et al*., 1997, used the computer as an aid in analyzing facial profile acceptability. The facial profiles were presented from extreme protrusive positions to extreme retrusive positions and vice versa 3 times each. For the first task, the subjects (N=12) pressed the mouse button when the soft tissue image was “acceptable” and released the button when the soft tissue image was no longer acceptable. For the second task, the subjects were asked to indicate when the profile became most pleasing by pressing the mouse button to stop the computer program at the desired frame.

Czarnecki *et al*., 1993; Foster, 1973; Johnston *et al*., 2005; Montini *et al*., 2007, employed a different approach by using questionnaires in their studies.

Czarnecki *et al.*, 1993, sent questionnaires to 1300 members of the dental profession, 545 correctly completed the survey instruments and returned them for analysis. One criticism here is that mailing may facilitate the distribution of questionnaires to a large number of subjects but it needs some level of understanding to answer the questions.

Johnston *et al.*, 2005, used 9 different series of 9 profile images (different in SNB angle) with the duplicate of the second image of that series. The duplicate images were used to assess intra-examiner repeatability. One hundred and two first-year social science students participated as judges in the study.

Spyropoulos and Halazonetis, 2001, created 2 albums. The first one contained the original pictures of 10 girls and the warped pictures of the other girls 10 and 3 composite images. The second one contained both the original and the warped pictures of the girls whose warped pictures were in the first album and 3 composite images. Each album contained 10 original, 10 warped and the same 3 composite images, placed in random order. The albums were shown to the judges (10 laypersons and 10 orthodontists) who were asked to score the attractiveness of each subject. Scoring was performed at 2 sessions, 1 week apart. The first album was used for the first session and the second album was used for the second session. The scores of 3 images which were presented in both albums were compared to measure bias from the order effect in the presentation of the albums to the judges.

Terms

Various terms are used in facial profile studies such as “very attractive” to “least attractive” (Montini *et al.*, 2007; Soh *et al.*, 2005a; Soh *et al.*, 2007), “scoring the attractiveness” (Coleman *et al.*, 2007; Spyropoulos and Halazonetis, 2001), “most favored” to “least favored” (Ioi *et al.*, 2005), “most preferred” to “least preferred” (Czarnecki *et al.*, 1993). However, the words “acceptable” and “unacceptable” would include all possible positive or negative value-laden words. Words in esthetic research such as “beautiful” or “attractive” may well yield different results. (Giddon *et al.*, 1996; Giddon *et al.*, 1997)

Mass media

Television, movies, advertising, etc. present faces that are generally thought of as "good looking". The impact of such media has been so widespread that individuals of varying ethnic and racial groups, who ordinarily would be expected to develop their own concepts of facial harmony, accept the "Hollywood standard" (Burstone, 1958). This factor affecting esthetic perception has been considered in the study of the most favored Japanese profile (Ioi *et al.*, 2005). Japanese orthodontists and young adults prefer a retruded profile, even though Japanese profiles have historically been characterized by more convex facial features.

Subjective and objective factors affect esthetic perception

Perception could be influenced by a variety of physical, physiological, psychological, and social factors. Many studies showed that different groups of people have different preferences for facial profiles.

Age

Foster, 1973, modified the lips of the original profile silhouette - labeled below as number four. Numbers three, two, and one to the left are successively 2 mm. retrusive and numbers five, six and seven to the right are successively 2 mm. protrusive compared to number four (shown in Figure 3).

Figure 3 Profile presented in questionnaire. Number seven profile to the far right is 12 mm. fuller in lips than number one to the far left. (Foster, 1973)

He noted that these drawings developed from youth and femininity at the right to age and masculinity at the left. The 6 groups of subjects of different backgrounds (general dentists, art students, orthodontists, a black lay group, a Chinese lay group and a white lay group) were asked to select one profile for each category from an 8 year old girl to an adult man. They could use one choice as often as they wished. The general trends of all groups preferred fuller profiles for younger ages and straighter profiles for adults.

There has been little literature studying the relationship between age of the subjects and facial profile preference. Soh *et al.*, 2007, found no significant difference in age, ethnicity and gender preference in choosing a male normal profile but adjusted analysis showed that older laypersons were significantly more likely to choose a normal male profile as the most attractive.

Gender

The gender of the subjects

Faces are very important in attraction and looking for a mate and they reflect the health of an individual as well as fertility. Women prefer more masculine faces during the most fertile period of their menstrual cycle. At other times, a more feminine-looking male face could be deemed desirable (Burstone, 2007; Perrett *et al.*, 1998). This is in contrast to Coleman *et al.*, 2007; Johnston *et al.*, 2005, whose works indicated that there were no gender differences in facial profile preferences.

The gender of the objects

Czarnecki *et al.*, 1993, had 545 professionals evaluate facial profile silhouettes with different facial angles and angles of convexity. The construction of silhouettes was identical for both sexes. The results showed that as the sagittal changes in the position of the chin (by changing soft tissue facial profile angle), a slightly more pronounced chin was favored by the males compared to the females. When the angle of convexity was used alone or combined with facial angle, participants from both sexes preferred similar profiles.

For the lip position, Foster, 1973, using the method previously mentioned, also found that all groups were consistent in liking females fuller than males in adults (aged more than 16). Even though Coleman *et al.*, 2007, found lip position preferences for the male and

female profile scattered and inconsistent, whenever a significant differences was detected, the preference was always for fuller lips in the female profile.

In contrast, Ioi *et al.*, 2005, compared the anteroposterior lip positions of the most favored Japanese profiles in orthodontists and dental students. The dental students prefered a more retruded lip position for women. Polk *et al.*, 1995, found that the sample populations preferred males with a fuller profile than African-American females.

Some studies showed no differences between preferred female and male profiles. (Mejia-Maidl *et al.*, 2005; Soh *et al.*, 2007)

These differing results have probably come about because of the different methods (computer modified images vs. silhouettes) or different subjects' backgrounds, especially their races.

Race

The race of the subjects

Comparing between Mexican Americans and Caucasians, in general, Mexican American prefer upper or lower lip positions to be less protrusive than Caucasians.(Mejia-Maidl *et al.*, 2005)

For Asians, no differences were found between Chinese, Malay and Indian facial profile preferences. (Soh *et al.*, 2007)

The race of the objects

Wuerpel (1937) noted racial differences in facial profile as early as 1937, and drew his perceived outlines of these differences.

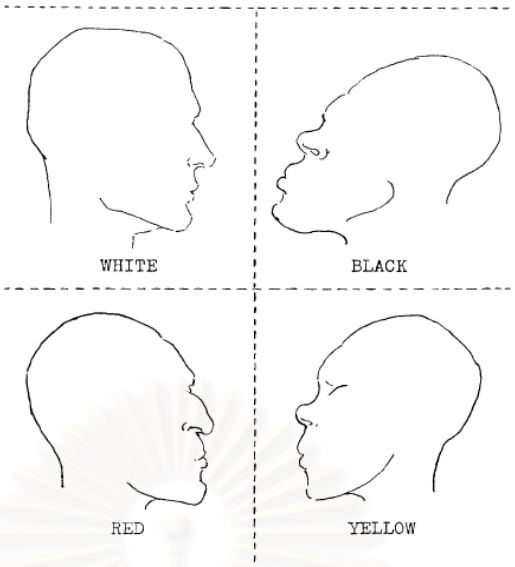


Figure 4 Profile suggested by (Wuerpel, 1937)

Races of the objects could affect the subjects' facial profile preferences (Hall *et al.*, 2000). Orthodontists (20 white, 18 African American) and 40 laypersons (20 white, 20 African American) evaluated the profile silhouettes of 30 African American and 30 white patients. All raters preferred the African American sample with convexity over the white sample. The raters preferred the African American sample with upper and lower lips that were more prominent compared with the white sample. African American profiles chosen as acceptable did not fall within the normal values for whites; however the white profiles did.

Other studies on different races also showed different results. Soh *et al.*, 2005a; Soh *et al.*, 2005b; Soh *et al.*, 2007, conducted their studies in Asia and found that normal and bimaxillary retrusive profiles were judged to be the most attractive in different subjects while profiles with protrusive mandible were judged the least attractive. Johnston *et al.*, 2005, studied in Northern Ireland and found that the profile with the normal SNB value was rated as the most attractive. The Class III profile was rated significantly more attractive than the Class II profile when the SNB angle diverged 5 degrees from the normal value.

In African-Americans, both male and female subjects prefer a relatively flat profile with varied fullness of the lips. (Polk *et al.*, 1995)

Perrett *et al.*, 1998, studied effects of sexual dimorphism on facial attractiveness. Subjects preferred feminized to average shapes of both male and female faces. This preference applied across UK and Japanese populations but was stronger for within-

population judgments, in other words, the Japanese preferred a Japanese feminized face to a Caucasian one. This indicates that attractiveness cues are learned.

Subjects' backgrounds

Subjects' background as a factor affecting their facial profile preferences has been addressed in many studies.

Foster, 1973, studied about profile preferences among 6 diversified groups – general dentists, art students, orthodontists, a black lay group, a Chinese lay group and a white lay group. His important finding was that the orthodontists, although recognizing a statistical difference between males and females according to their preference for different lip contours, were not half as emphatic in their separation of sexes as any of the other groups.

Arpino *et al*., 1998, studied patients scheduled for orthognathic surgery or patients who had tentatively planned to undergo orthognathic surgery and compared the findings with significant others (i.e., patents, spouse, family members, friends, etc.), orthodontists and oral surgeons. Although all groups had similar preferences, orthognathic patients have the lowest tolerance for deviation from the preferred image.

Ioi *et al*., 2005, concluded that Japanese orthodontists and dental students preferred a profile with slightly retruded lips. The dental students preferred a more retruded lip position for women. The least preferred profile was the most protrusive.

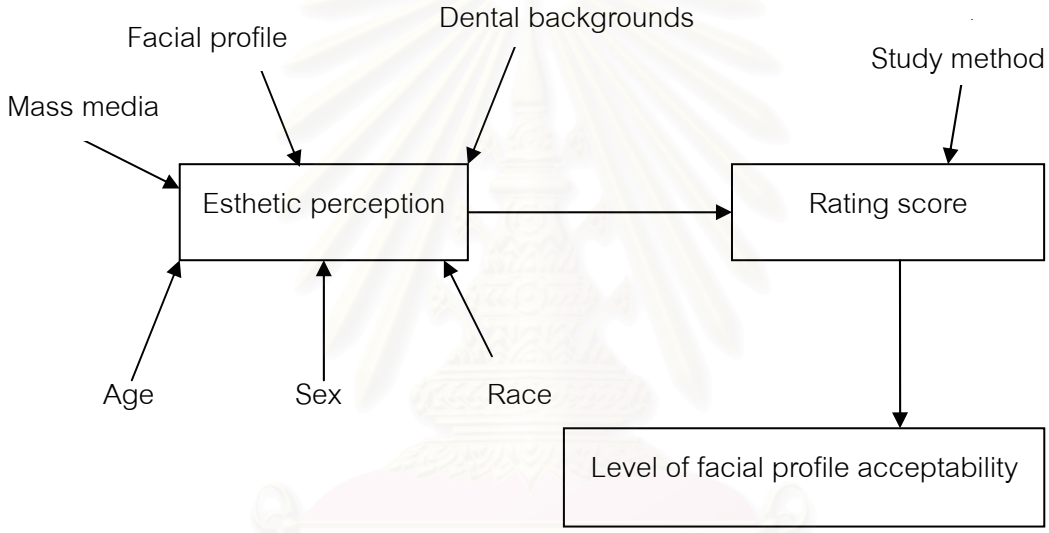
Burstone, 2007, asserted that orthodontists tend to look at lip protrusion or retrusion and symmetry while patients and their families may look at entirely different characteristics.

The main idea of this research was similar to the work of Haxton and Giddon, 1985. Four groups of 20 people each varying in familiarity with cranio-facial deformities (CFD) participated: children with CFD and accompanying parents, orthodontic patients and parents, unaffected children and parents, a professional group of dentists, hygienists and assistants. They were asked to rank stimulus photographs varying in interocular distance as "acceptable" or "unacceptable". The results showed that orthodontic patients and parents and the professional group had a significantly lower threshold for recognition of separation of the eyes shown in the upper 1/3 of the face than did the CFD and unaffected children and parents while CFD showed the greater sensitivity of the eye changes within the whole face.

Was it possible that the concave profile patients were more tolerant to the concave profile than the straight or normal profile patients, just like the children with cranio-facial deformities? Was it possible that the patients with convex profiles were more tolerant to the convex profile than the straight or normal profile patients?

The answers to these questions would help us understand more about the perception of the patients and better inform us about diagnosis and treatment planning.

Conceptual framework



CHAPTER III

RESEARCH METHODOLOGY

Population & Sample

Population: Adult Thai orthodontic patients

Sample: Fifty-eight orthodontic patients currently treated in the Orthodontic Department, Faculty of Dentistry, Chulalongkorn University.

Nineteen orthodontists were included in this study as a gold standard group.

Variables

Independent variables

Facial profiles which were convex, straight and concave

Dependent variables

Level of Acceptability

Confounding factors

1. Age
2. Gender
3. Race
4. Dental backgrounds
5. study methods

Inclusion and exclusion criteria

Inclusion criteria

1. The subjects were selected from the patients currently treated in orthodontic department, faculty of dentistry, Chulalongkorn University.
2. The age range was limited form 16 to 35 years old on the day the questionnaire was carried out.
3. Their races were Thai
4. Their educational levels were high school or above at the time of the study.

Exclusion criteria

1. Patients with developmental deformities which affected normal growth and development especially facial components such as cleft lip and/or palate.
2. Patients who failed to identify the facial profile silhouettes' differences.

Data collection

Subjects

1. The pre-treatment lateral cephalometric radiographs of orthodontic patients currently treated in the Orthodontic Department, Faculty of Dentistry, Chulalongkorn University were traced. Soft tissue landmarks (G, A, Pg') were marked and facial contour angles (FCA) were measured by a single dentist
2. Fifty-eight patients were selected by purposive sampling method. The patients were divided into 3 groups: concave, straight, and convex profiles according to Thai norms.
3. If the subjects fail to identify the difference between each constructed faces, he or she is excluded from the study. The new subjects would be selected by purposive sampling.
4. The questionnaires were given to the subjects after their visits.

Facial constructions

FaceGen Modeller 3.1.2 ® software (Singular Inversions Inc., Vancouver, British Columbia) (Blanz and Vetter, 1998) was used to create the facial profile distortion. Although the constructed facial profiles' details were shown such as eyes, skin tone, race, all confounding factors could be adjusted following to the manufacturer's instructions. In other words, the constructed facial profiles could be produced without any factors generating distractions and still look more "realistic" to the subjects compared to silhouettes.

1. Average male and female profiles, age 30, of average attractiveness and all races were used as baselines after the slide bars in the shape category was set all to zero. The hairstyles were intentionally omitted to prevent any bias.

2. On the profile view, the chin-pronounced/recessed slider was slid to produce normal FCA and 6 plus and minus following the manufacturer's instructions. As a result, 13 constructed faces were saved and used in the questionnaires.

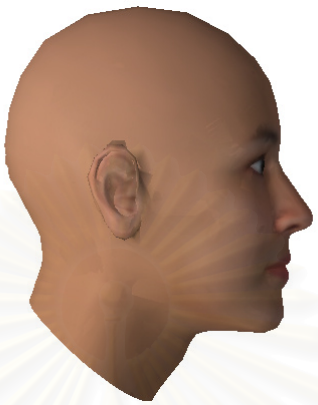


Figure 5 shows facial profile constructed by FaceGen Modeller 3.1.2, straight profile (facial contour angle is 9.5°)

The normal male profile's FCA was 10°. The slightest convex profile's FCA was 4° and the slightest concave profile's FCA was 14°. For females, the normal FCA was 9°. The slightest convex FCA was 15° and the slightest concave profile's FCA was 5°. The next five convex and concave profiles of both male and female facial profiles were adjusted according to the software.

Questionnaire construction

The questionnaire was composed of 3 parts. The first part was about general information such as name, age and level of education. The second part asked the patients to identify the "retruded chin" and "protruded chin" profiles. If they failed to do so, they were eliminated from the study. They were also asked to evaluate themselves. Five constructed profiles were presented; one was normal, two had different degrees of convex profiles and the others had different degrees of concave profiles. The patients were asked to evaluate themselves before orthodontic treatment compared to these constructed facial profiles.

The last part was to evaluate their acceptable facial profiles. Eight constructed facial profiles of each sex were presented - 2 straight profiles and the other 6 facial profiles

starting from decreased FCA to the most concave profile and vice versa, arranged in random order. As a result, the last part of the questionnaire comprised 4 pages: male concave profiles (Figure 6), male convex profiles, female concave profiles and female convex profiles. The last part was the only one given to the orthodontists.

The subjects were asked to choose from these 8 facial profiles those which were "acceptable" to them. They could choose as many profiles as they wished. The questionnaire was given to the patients on their visit. The frequency of each selected profile was used in the calculations.

Data analysis

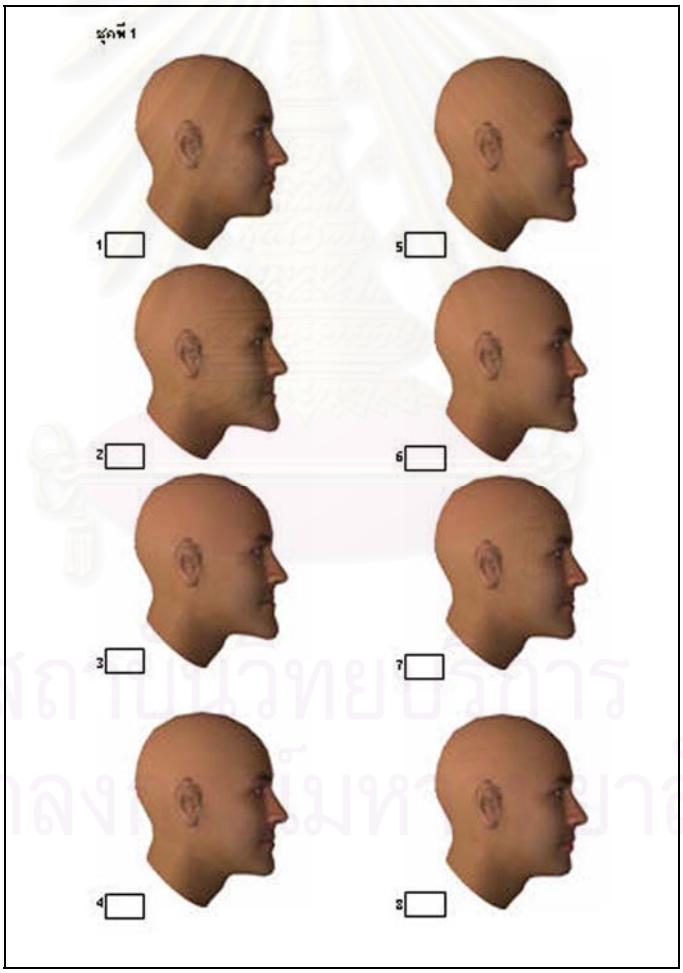


Figure 6 shows a sample of one of pages from the questionnaire. This is the male-concave-profile page. Profiles number 1 and 8 are straight profiles. The others are arranged in random order.

Measurement reliability

1. **Accuracy**: The dentists whose cases were included in the study share the same background, level of education and experiences.
2. **Precision**: The Gn, Sn and Pg' points were marked and the facial contour angle of each subject was measured by a single examiner. Same tracings were marked and measured 2 times separately and compare with paired T-test and correlation.
3. **Calibration**: Error of the dentists whose cases were obtained is analyzed. All of them traced the same cephalometric radiographs at noon. The facial contour angles of each tracing was measured and compared.
4. The subjects' repeatability was assessed with the repeat normal male and female constructed faces.

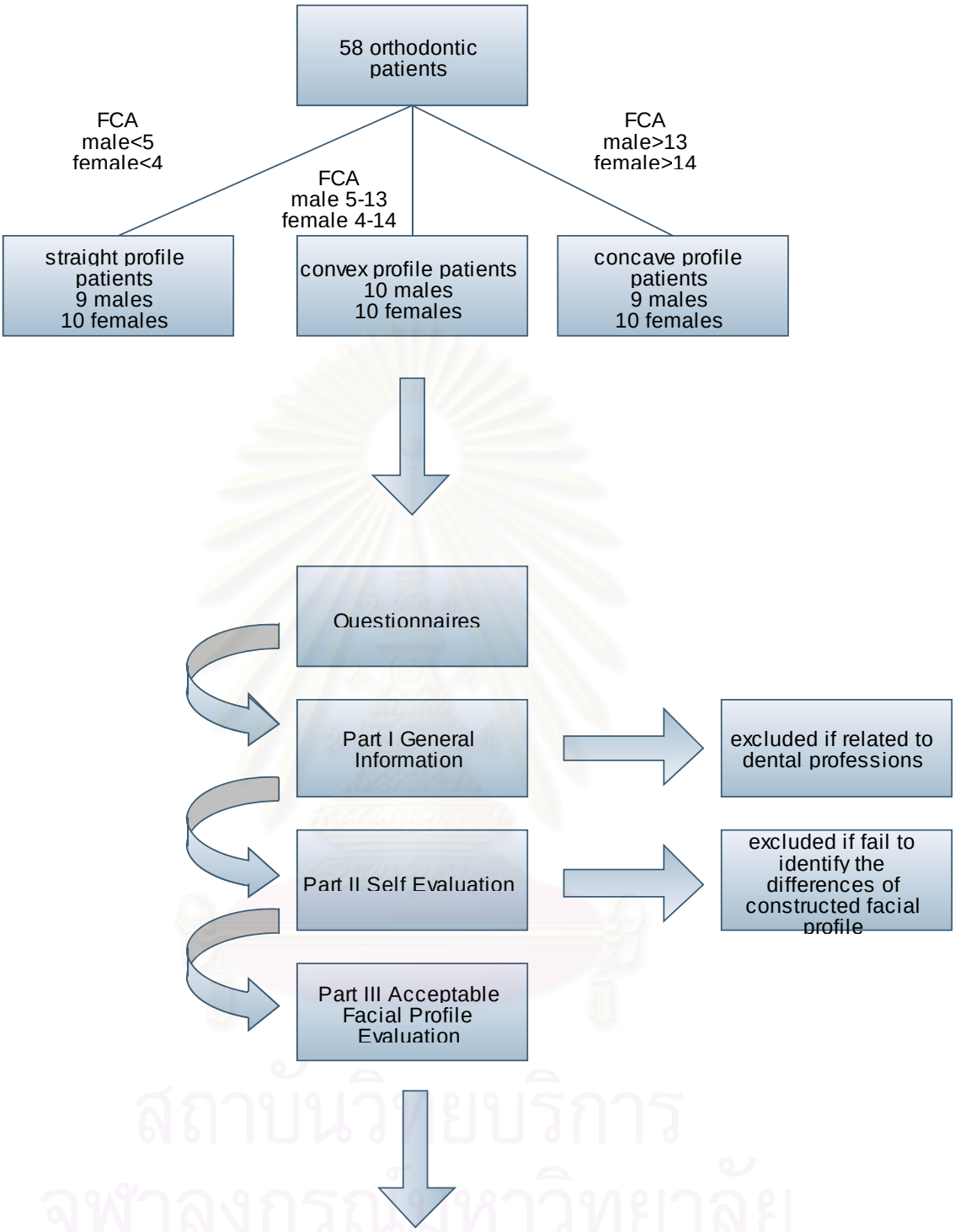


Figure 7 shows how the study is conducted.

Ethical consideration

This study was approved by ethical committee. All of the subjects were informed about the study overview, how the subjects were going to be involved. The informed consents were signed if the subjects agree to participate. The subjects had the right to withdraw themselves from the study at anytime.

CHAPTER IV

RESULTS

The study of acceptable facial profiles was conducted in 77 samples which were purposively selected. The sample distribution is shown in Tables 1 and 2. The mean of the patients' age was 22.76±4.65 years old. The aim was to determine the acceptable facial profiles of non-straight profile patients.

		type		Total
		patient	orthodontist	
sex	male	28	10	38
	female	30	9	39
Total		58	19	77

Table 1 shows sample distribution

		profile			Total
		straight	convex	concave	
sex	male	9	10	9	28
	female	10	10	10	30
Total		19	20	19	58

Table 2 shows profile distribution on patient group

In the questionnaire, the acceptable facial profiles were separated into 4 categories; acceptable male concave profiles, acceptable male convex profiles, acceptable female concave profiles and acceptable female convex profiles. Each page contained 2 normal (straight) profiles to check for their reproducibility on two levels; their ability to identify all straight profiles and to identify at least one straight profile on every page. The subjects could choose as many profiles as they wanted on each page. The frequency of each profile that was selected by the subjects was used in the calculations.

Figure 8 shows that the straight profiles were most selected whether or not they appeared among concave or convex profiles. Convex profiles were selected more than concave profiles if deviating equally from normal.

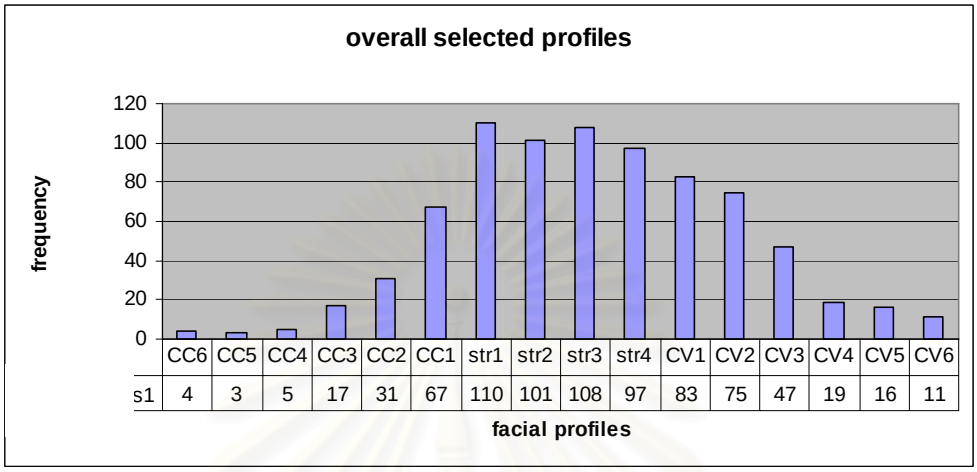
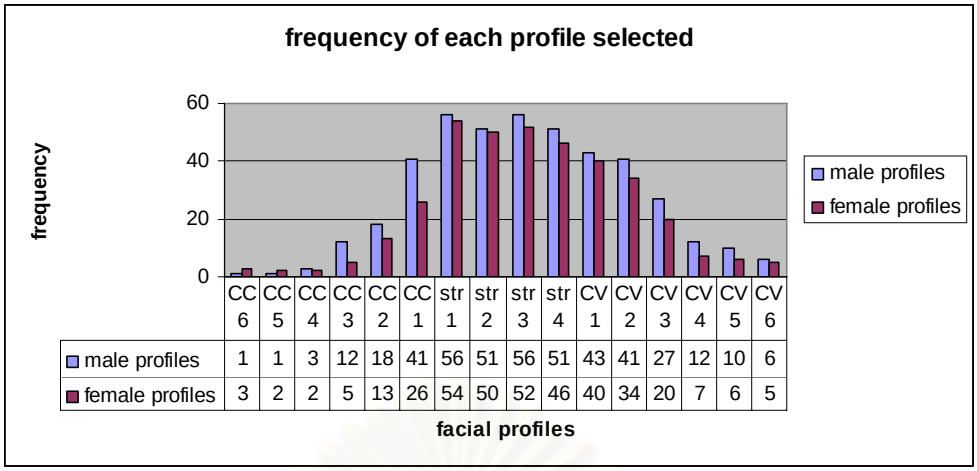


Figure 8 shows overall acceptable profiles of all patient subjects. CC stands for concave, CV stands for convex. The numbers 1 to 6 stands represent the severity of each facial profile from small to large. Str 1 and Str 2 stand for straight profiles which were shown on the CC profile pages while Str 3 and Str 4 stand for straight profiles which were shown on the CV profile pages.

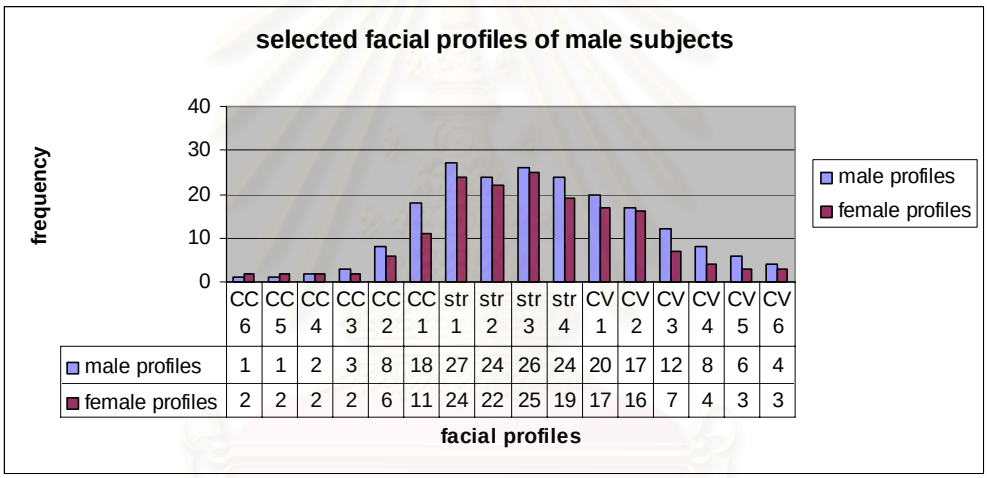
Comparison between male and female facial profiles

Figure 9 shows that male profiles were accepted more than female profiles except for the two most concave profiles. The two most concave profiles, however, were accepted more by male subjects than females. (Figure 10 and 11) Patients could accept male facial profiles deviating from normal more than female profiles, as shown by the higher frequency. Both male and female convex profiles were accepted more than concave profiles if deviating equally from normal.



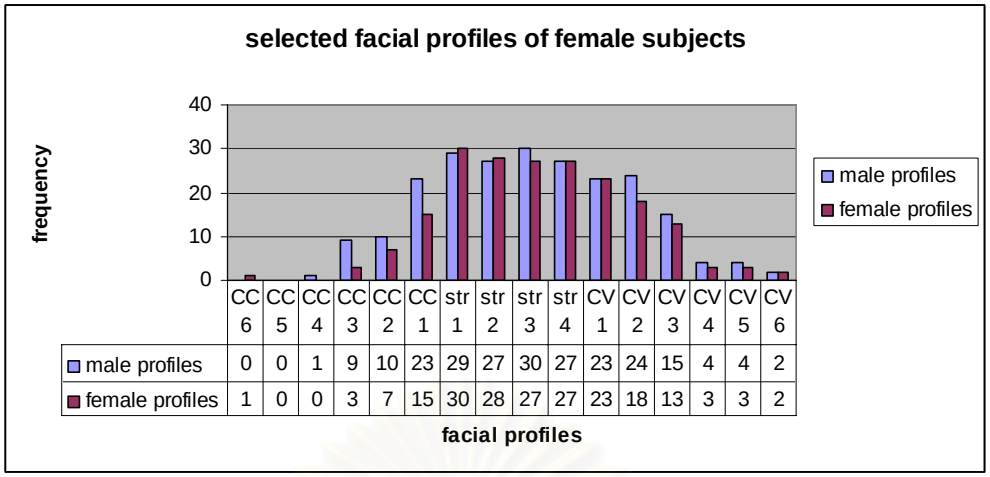
	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
male profiles	1	1	3	12	18	41	56	51	56	51	43	41	27	12	10	6
female profiles	3	2	2	5	13	26	54	50	52	46	40	34	20	7	6	5

Figure 9 shows overall selected profiles in a comparison between male and female facial profiles.



	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
male profiles	1	1	2	3	8	18	27	24	26	24	20	17	12	8	6	4
female profiles	2	2	2	2	6	11	24	22	25	19	17	16	7	4	3	3

Figure 10 shows acceptable facial profiles of male subjects, compared between male and female profiles.



	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
male profiles	0	0	1	9	10	23	29	27	30	27	23	24	15	4	4	2
female profiles	1	0	0	3	7	15	30	28	27	27	23	18	13	3	3	2

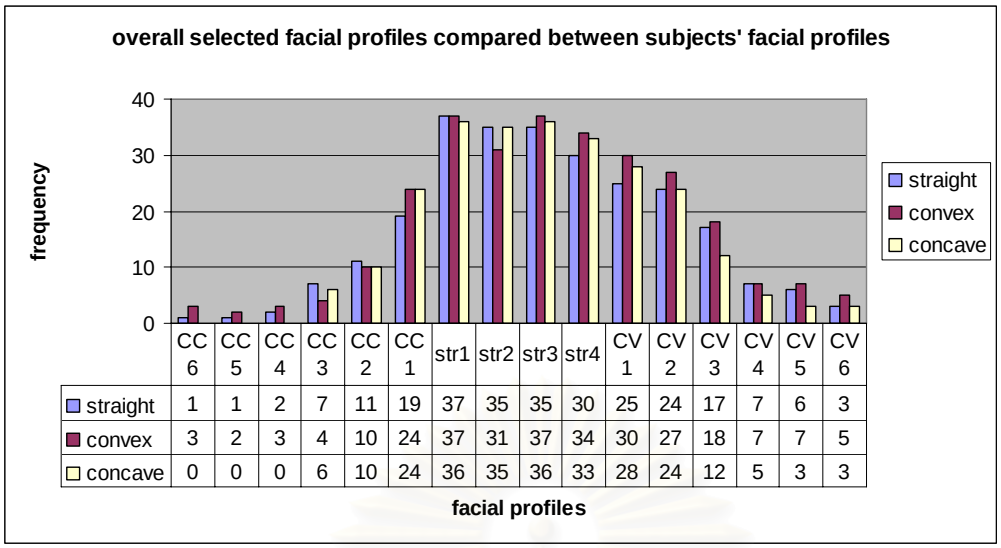
Figure 11 shows acceptable facial profiles of female subjects, compared between male and female profiles.

Comparison between male and female subjects

Figures 10 and 11 indicate that both male and female subjects showed the same trend as subjects overall', that is straight profiles are the most popular facial profiles. Male and female subjects accepted male and female convex profiles more than concave profiles if deviating equally from normal. However, female subjects were less likely to accept male and female concave profiles even though the numbers of the female subjects were more than males. None of the female subjects accepted the two most concave male profiles. Female subjects accepted each male profile more than the male subjects except for the three most concave and convex profiles. Among the three most concave profiles, only one female subject accepted the most concave female profiles.

Acceptable facial profiles of straight, convex and concave profile subjects

Straight, convex and concave profile subjects accepted straight profiles more than other profiles and accepted convex profiles more than concave profiles if deviating equally from normal. Convex profile subjects always accepted convex profiles equally or more than any other profile subjects, but none of the concave profile subjects accepted the 3 most concave profiles. (Figure 12)

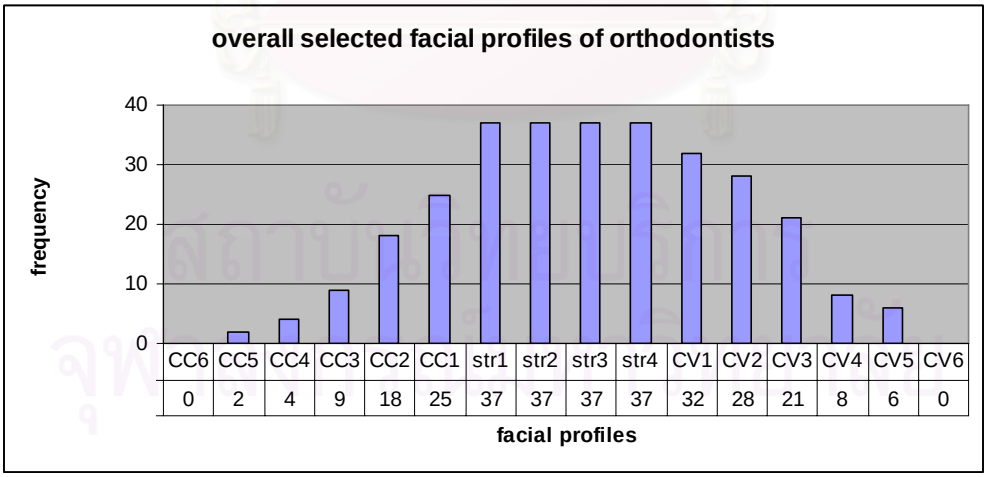


	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
straight	1	1	2	7	11	19	37	35	35	30	25	24	17	7	6	3
convex	3	2	3	4	10	24	37	31	37	34	30	27	18	7	7	5
concave	0	0	0	6	10	24	36	35	36	33	28	24	12	5	3	3

Figure 12 shows overall acceptable facial profiles compared between straight, convex and concave facial profile subjects.

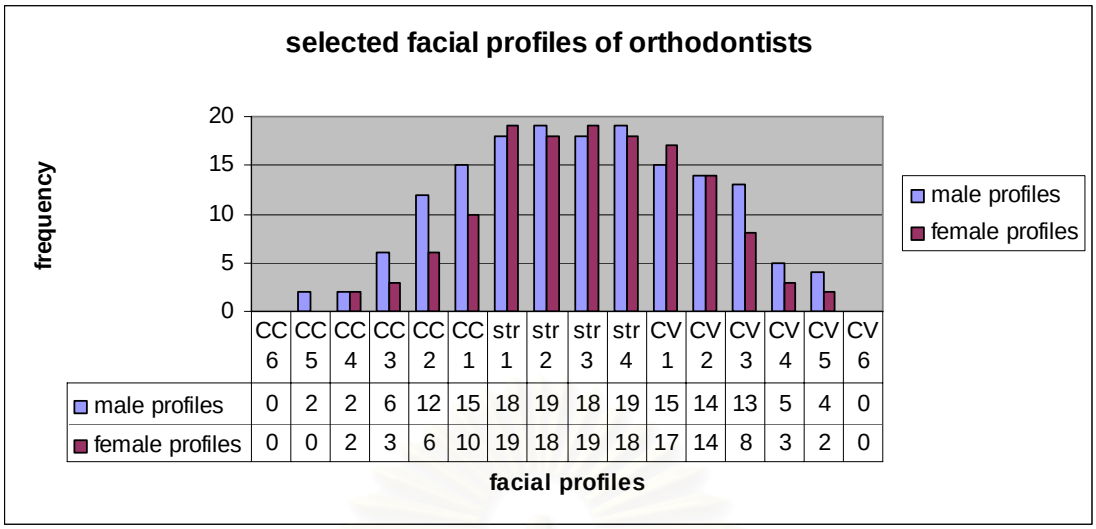
Orthodontists

Straight profiles were selected the most among all facial profiles. Convex profiles were accepted more often than concave profiles if deviating equally from normal which follows the same trend as the patients. However, none of the orthodontists accepted the most concave and convex profiles. (Figure 13)



CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
0	2	4	9	18	25	37	37	37	37	32	28	21	8	6	0

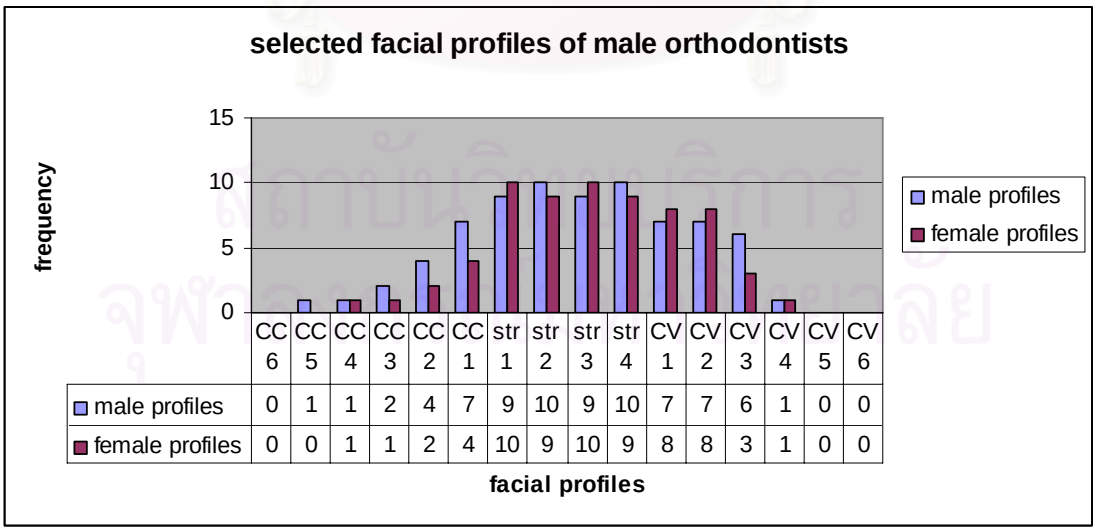
Figure 13 shows the overall acceptable facial profiles of orthodontists.



	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
male profiles	0	2	2	6	12	15	18	19	18	19	15	14	13	5	4	0
female profiles	0	0	2	3	6	10	19	18	19	18	17	14	8	3	2	0

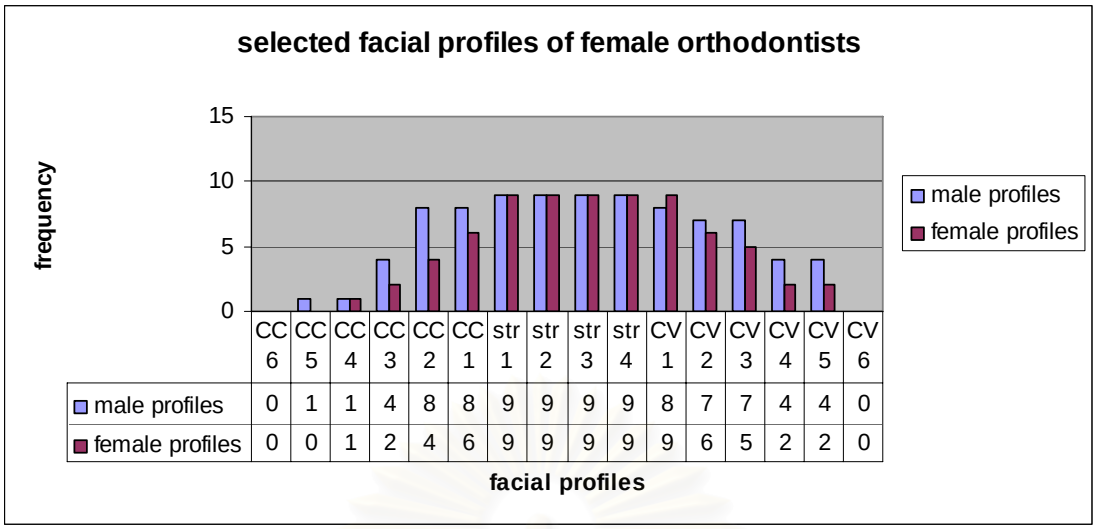
Figure 14 shows overall acceptable facial profiles selected by orthodontists comparing between male and female facial profiles.

From figure 14, male profiles were accepted equally or more than female profiles except for CC4 and CV1. None of orthodontists accepted the two most concave female profiles. Female orthodontists accepted the fifth convex profiles comparing to none of male orthodontists. (Figure 15 and Figure 16) It should be noted that female orthodontists were less that male orthodontists in this study.



	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
male profiles	0	1	1	2	4	7	9	10	9	10	7	7	6	1	0	0
female profiles	0	0	1	1	2	4	10	9	10	9	8	8	3	1	0	0

Figure 15 shows acceptable facial profiles selected by male orthodontists

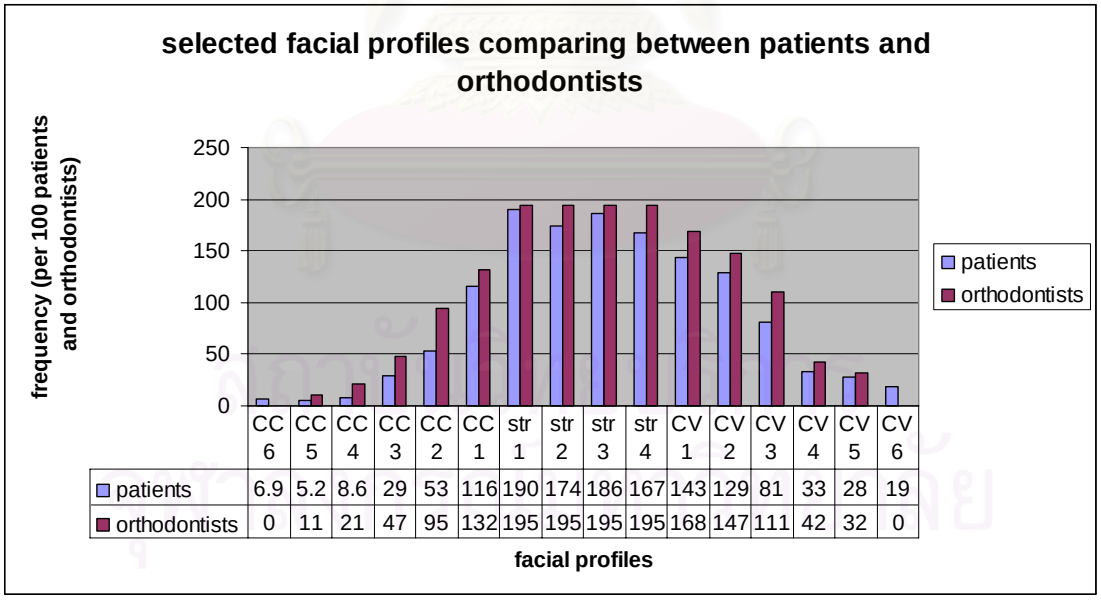


	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
male profiles	0	1	1	4	8	8	9	9	9	9	8	7	7	4	4	0
female profiles	0	0	1	2	4	6	9	9	9	9	9	6	5	2	2	0

Figure 16 shows acceptable facial profiles selected by male orthodontists.

Comparison between patients and orthodontists

Figure 17 shows that orthodontists tended to accept concave and convex profiles more than subjects in every degree of deviations except the most convex and concave profiles which were considered acceptable by the subjects.



	CC6	CC5	CC4	CC3	CC2	CC1	str1	str2	str3	str4	CV1	CV2	CV3	CV4	CV5	CV6
patients	6.9	5.2	8.6	29	53	116	190	174	186	167	143	129	81	33	28	19
orthodontists	0	11	21	47	95	132	195	195	195	195	168	147	111	42	32	0

Figure 17 shows acceptable facial profiles selected by patients and orthodontists. Because the numbers of subjects in both groups are not equal, the frequencies of each selected profile were calculated per 100 patients and orthodontists.

Reproducibility of the subjects

As mentioned previously, each page contained 2 straight profiles. The subjects may choose all of them, one of them or none on the same page of the questionnaire. If the subjects chose one or both of the straight profiles in every page of the questionnaire, they showed the first level of their reproducibility. The results show that 89.7% of the subjects are reliable. They chose the straight profiles on every page. For orthodontists, 100% of them chose the straight profiles on every page. If the subjects chose all of the straight profiles, they showed the second level of their reproducibility. Sixty-nine percent of the subjects always chose straight profiles whenever they appeared, compared to 94.7% of the orthodontists.

The Chi-square was used to compare the reproducibility between subjects and orthodontists in the first level and showed that it was not statistically significant. The orthodontists and the subjects can equally identify straight profiles on each page as normal. However, the comparison between reproducibility between subjects and orthodontists in the second level showed significant difference (Chi-square, $P<0.05$.) The orthodontists were statistically more able to identify straight profiles wherever they appeared than patients.

Self assessment

The number of subjects' overall self assessments that were right (48.30%) were nearly as many that were wrong (43.10%). However, non-straight profile subjects could assess themselves more accurately than those straight profile subjects. Only 15.78% of straight profile subjects could accurately assess themselves as having straight profiles compared to 65% of convex profile subjects and 63.16% of concave profile subjects.

profile			Frequency	Percent
straight	Valid	incorrect	16	84.21
		correct	3	15.78
		Total	19	100
convex	Valid	incorrect	3	15.00
		correct	13	65.00
		missing	4	20
		Total	20	100
concave	Valid	incorrect	6	31.58
		correct	12	63.16
		missing	1	5.26
		Total	19	100

Table 3 shows each group of subjects' self assessment.

CHAPTER V

DISCUSSION AND CONCLUSION

Discussion

The aim of this study was to determine the acceptable facial profiles of non-straight profile subjects and whether they were different from straight profile subjects. Gender difference was also considered to have an effect. An orthodontists group was also studied to find out possible differences from subjects' preferences.

Our computer-modified facial constructions using FaceGen Modeller 3.1.2® software (Blanz and Vetter, 1998) are new. The program can eliminate any confounding factors. Many other studies used computer software to distort photographs(Giddon, 1995; Giddon *et al.*, 1996; Giddon *et al.*, 1997; Soh *et al.*, 2005a; Soh *et al.*, 2005b; Soh *et al.*, 2007; Türkkahraman and Gökalp, 2004). However the distorted photographs still showed the overall features of the subjects and probably influenced the judgments. Silhouettes were used to eliminate these confounding factors; however, it was quite hard to ask the subjects to imagine these silhouettes as being male or female (Coleman *et al.*, 2007). Further studies may compare these methods if there is any difference in subjects' preferences.

Our acceptable facial profiles were calculated from the frequency of each selected facial profile. Simply, the scoring was the same as the rating score, for example, scoring 1 if the facial profile was least preferred and 10 if the facial profile was most preferred. But instead of scoring each profile according to his/her preference, the patient selected the one he/she accepted and scored only one whether he/she found it most attractive or bordering on his/her acceptance. The rating score probably does not reflect the real acceptability. The subjects might rate the profiles as "least preferred" but it did not mean that they could not accept those profiles as concluded. (Czarnecki *et al.*, 1993)

The straight profiles were most selected, in other words, most accepted, whether or not they appeared among concave or convex profiles. Many other studies showed that the normal facial profiles were most preferred too. (Dongieux and Sassouni, 1980; Johnston *et al.*, 2005; Soh *et al.*, 2007; Türkkahraman and Gökalp, 2004). It is often said beauty may be in the eye of the beholder. However, the norms that our pioneers in orthodontics had worked on are still reliable in this sense. The facial profile with normal FCA is still widely acceptable, even though it may not be considered the "most preferred."

The convex profiles were always more acceptable than concave profiles if they deviated equally from normal. This could be explained by the assertion that the convex profiles were considered to be younger and more feminine than concave profiles. (Foster, 1973) Türkkahraman and Gökalp, 2004,considered raters' personal profiles to be a factor affecting profile preference too. They concluded that the rater's personal profile had little effect on one's esthetic preferences, but the raters' personal profiles were determined only by visual examinations conducted by the authors, in contrast to our study using FCA as a criterion to determine the facial profile of the subjects. However, FCA may not be precisely accurate because if the patient has negative FCA along with openbite, the measured FCA may be close to normal or even normal. Further studies may add vertical criteria to classify the patient's facial profile.

When the acceptable facial profiles were compared between straight, convex and concave subjects, none of the concave profile subjects accepted the 3 most concave profiles while the convex profile subjects always accepted convex profiles equally or higher than any other profile subjects. In contrast with the previous study, orthognathic patients had the lowest tolerance for deviation from the preferred image compared to significant other (i.e., patents, spouse, family members, friends, etc.) and orthodontists (Arpino *et al*., 1998). The study used patients' own profiles to make distortions so the patients probably had less tolerance to their own distorted facial profiles than others. It can be implied clinically that a more aggressive treatment plan should be considered in concave profile patients than convex ones.

Gender difference can be viewed from 2 aspects. First, male and female profiles were compared from the overall subjects' point of view. The result shows that the subjects could accept males to have both more concave profiles and convex profiles than females, except for the two most concave profiles. It can also be said that the subjects could accept male profiles to "deviate from normal" more than female profiles. This finding is contrast to some other studies in which the straighter adult male profile was preferred over the female's (Orsini *et al*., 2006; Türkkahraman and Gökalp, 2004). There are two explanations. First, this may reflect the usage and effect of terms used in esthetic studies. The words "acceptable" and "unacceptable" would include all positive and negative value-laden connotations while using "most preferred" or "most attractive" would yield only positive connotations.(Giddon *et*

al., 1996; Giddon *et al*., 1997) Racial Differences probably the other explanation. Their subjects were white and Japanese American (Orsini *et al*., 2006) or Turkish (Türkkahraman and Gökalp, 2004). Our findings may be applied to treatment plans for orthodontic patients of different sexes. That is, male patients can accept more esthetically compromised treatment plans than females.

Second, when comparison was made between male and female subjects, female subjects were less likely to accept male and female concave profiles. None of the female subjects accepted the two most concave male profiles. This is contrast to the reports of some studies.(Coleman *et al*., 2007; Johnston *et al*., 2005) Their subjects were white so the racial differences probably explained the results. It can be concluded that female patients are more concerned about esthetics than male patients. A compromised treatment plan especially in skeletal Class III malocclusion should be carefully discussed.

From previous studies, orthodontists were usually studied but as a single group regardless of sex.(Maple *et al*., 2005; Montini *et al*., 2007; Orsini *et al*., 2006) Coleman *et al*., 2007, found no difference between male and female orthodontists' preferences on influence of chin prominence on esthetic lip profiles. From our study, male and female orthodontists showed slight differences. Female orthodontists accepted the severe convex profiles more than male orthodontists. The treatment plan of skeletal Class II malocclusion of female orthodontists probable more aggressive.

The orthodontists' acceptable facial profiles showed the same trend as the patients'. The straight profiles were most accepted and the convex profiles were always more acceptable than concave profiles if they deviated equally from normal. Even though the orthodontists were trained to be "line-oriented" (Foster, 1973), they could accept facial profiles that deviated from normal just as the patients did. It can be implied that orthodontists' acceptable soft tissue profiles follow the same trend as the patients'. However, the orthodontists tended to accept each profile more than patients did except the two most concave and convex profiles. Therefore, it should be kept in mind that the most severe concave or convex profiles are still acceptable to some of the patients while some patients might not accept the convex and concave profiles that orthodontists do.

Patients and orthodontists accepted straight profiles more than any other profile, which was in agreement with previous studies.(Johnston *et al*., 2005; Türkkahraman and

Gökalp, 2004) However, our data shows that patients and orthodontists tended to accept convex profiles more than concave profiles while the results from some others went the opposite way. (Ioi *et al*., 2005; Johnston *et al*., 2005; Soh *et al*., 2007) Tükkahraman and Gökalp, 2004, concluded that patients least preferred retrognathic profiles in both sexes. In the Asian subjects, males and females with protrusive mandibles were judged to be least attractive. (Ioi *et al*., 2007; Soh *et al*., 2005a; Soh *et al*., 2005b; Soh *et al*., 2007) Therefore, this is once again probably explained by the difference of the races of the subjects.

The patients were able to identify the straight profiles on each page even though the total correct number of identifications was not as many as the orthodontists. This might be because they were unaware that there was more than one straight profile. The orthodontists were able to identify straight profiles wherever they appeared to a significantly higher degree than the patients. This can be explained, as mentioned previously, by the fact that the orthodontists are “line-oriented.” (Foster, 1973) We do have tools to analyze the soft tissue profiles. Sixty-nine percent of the patients chose straight profiles whenever they appeared. This confirmed the notion that the patients could detect the straight profiles and preferred those most.

As many patients’ self assessments were right as wrong. In contrast with Polk *et al*, 1995, more than two thirds of their respondents could not select which profile silhouette most resembled themselves. (Polk *et al*., 1995) It could be explained that they used facial profile silhouettes while we used facial profile constructed from computer software. Furthermore, their subjects were not orthodontic patients while our subjects were orthodontic patients currently receiving treatment. The patients probably knew about their deviations from a normal profile. Furthermore, non-straight profile subjects could assess themselves more accurately than those straight profile subjects. Patients with non-straight profiles probably know more about their problems than those normal profile patients.

Conclusion

For patients, the straight profile was the most popular facial profile and convex profiles were more acceptable than concave profiles if they deviated equally from normal. The same trend was found among orthodontists. The acceptable facial profiles of straight, convex and concave profile subjects were different. Convex profile subjects accepted convex profiles equally or more than any other profile subjects while concave profile subjects tended not to accept severely concave profiles. Male profiles were more acceptable if they deviated from normal. Male subjects could accept severe concave profiles more than female subjects.

Clinical Implications

1. Female patients are more concern about esthetics than male patients
2. Male patients can accept more esthetically compromised treatment plans than females.
3. In female patients, a compromised treatment plan especially in skeletal Class III malocclusion should be carefully discussed.
4. A more aggressive treatment plan (orthognathic surgery) should be considered in concave profile patients than convex ones.
5. Norms are still reliable. The patients with normal facial profile are acceptable in every group of subjects.

Suggestion

1. Further studies may compare between different methods of facial profile constructions such as silhouettes and Facegen Modeller 3.1.2® software in the same group of subjects if there is any difference in subjects' preferences.
2. Further studies may compare between the acceptable range of facial profiles of the patients and the possible soft-tissue-change after orthodontic treatment of the same patients. The differences between patients' preferences and possible treatment outcomes will be practically useful in treatment plans.
3. If the number of subjects is more, the difference between each group acceptable facial profiles is probably more obvious than ours.

References

Angle EH (1899). Classification of malocclusion. *The dental cosmos* 41:248-264.

Arnett GW, Bergman RT (1993a). Facial keys to orthodontic diagnosis and treatment planning--Part II. *Am J Orthod Dentofacial Orthop* 103(5):395-411.

Arnett GW, Bergman RT (1993b). Facial keys to orthodontic diagnosis and treatment planning. Part I. *Am J Orthod Dentofacial Orthop* 103(4):299-312.

Arpino VJ, Giddon DB, BeGole EA, Evans CA (1998). Presurgical profile preferences of patients and clinicians. *Am J Orthod Dentofacial Orthop* 114(6):631-7.

Bell R, Kiyak HA, Joondeph DR, McNeill RW, Wallen TR (1985). Perceptions of facial profile and their influence on the decision to undergo orthognathic surgery. *Am J Orthod* 88(4):323-32.

Blanz, V., Vetter, T. (1998). A morphological model for the synthesis of 3D faces [online]. Max-Planck Institut füer Ibiologische Kybernetik Tübingen, Germany. Available from:http://www.kyb.tuebingen.mpg.de/bu/people/volker/morphmod2.pdf [2008, Apr 1]

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

Burstone CJ (2007). Charles J. Burstone, DDS, MS. Part 1 facial esthetics. Interview by Ravindra Nanda. *J Clin Orthod* 41(2):79-87; quiz 71.

Coleman GG, Lindauer SJ, Tufekci E, Shroff B, Best AM (2007). Influence of chin prominence on esthetic lip profile preferences. *Am J Orthod Dentofacial Orthop* 132(1):36-42.

Czarnecki ST, Nanda RS, Currier GF (1993). Perceptions of a balanced facial profile. *Am J Orthod Dentofacial Orthop* 104(2):180-7.

Dongieux J, Sassouni V (1980). The contribution of mandibular positioned variation to facial esthetics. *Angle Orthod* 50(4):334-9.

Downs WB (1955). Analysis of the dentofacial profile. *Angle Orthod* 26(4):191-212.

Foster EJ (1973). Profile preferences among diversified groups. *Angle Orthod* 43(1):34-40.

Giddon DB (1995). Orthodontic applications of psychological and perceptual studies of facial esthetics. *Semin Orthod* 1(2):82-93.

Giddon DB, Sconzo R, Kinchen JA, Evans CA (1996). Quantitative comparison of computerized discrete and animated profile preferences. *Angle Orthod* 66(6):441-8.

Giddon DB, Evans CA, Rains CE, Clemens IK (1997). Influence of magnitude of horizontal and vertical deformation on preference for morphed faces. *Percept Mot Skills* 85:1303-1313.

Hall D, Taylor RW, Jacobson A, Sadowsky PL, Bartolucci A (2000). The perception of optimal profile in African Americans versus white Americans as assessed by orthodontists and the lay public. *Am J Orthod Dentofacial Orthop* 118(5):514-25.

Haxton JM, Giddon DB (1985). Quantitation of tolerance for cranio-facial deviation [abstract]. *J Dent Res* 64:292.

Holdaway RA (1983). A soft-tissue cephalometric analysis and its use in orthodontic treatment planning. Part I. *Am J Orthod* 84(1):1-28.

Holdaway RA (1984). A soft-tissue cephalometric analysis and its use in orthodontic treatment planning. Part II. *Am J Orthod* 85(4)*:*279-93.

Hwang HS, Kim WS, McNamara JA Jr. (2002). Ethnic differences in the soft tissue profile of Korean and European-American adults with normal occlusions and well-balanced faces. *Angle Orthod* 72(1)*:*72-80.

Ioi H, Nakata S, Nakasima A, Counts AL (2005). Anteroposterior lip positions of the most-favored Japanese facial profiles. *Am J Orthod Dentofacial Orthop* 128(2)*:*206-11.

Ioi H, Nakata S, Nakasima A, Counts A (2007). Influence of facial convexity on facial attractiveness in Japanese. *Orthod Craniofac Res* 10(4)*:*181-6.

Johnston C, Hunt O, Burden D, Stevenson M, Hepper P (2005). The influence of mandibular prominence on facial attractiveness. *Eur J Orthod* 27(2)*:*129-33.

Kokich VO, Kokich VG, Kiyak HA (2006). Perceptions of dental professionals and laypersons to altered dental esthetics: asymmetric and symmetric situations. *Am J Orthod Dentofacial Orthop* 130(2)*:*141-51.

Lee S, McGrath C, Samman N (2007). Quality of life in patients with dentofacial deformity: a comparison of measurement approaches. *Int J Oral Maxillofac Surg* 36(6)*:*488-92.

Legan HL, Burstone CJ (1980). Soft tissue cephalometric analysis for orthognathic surgery. *J Oral Surg* 38(10)*:*744-51.

Maple JR, Vig KW, Beck FM, Larsen PE, Shanker S (2005). A comparison of providers' and consumers' perceptions of facial-profile attractiveness. *Am J Orthod Dentofacial Orthop* 128(6)*:*690-6; quiz 801.

McIntyre GT, Mossey PA (2003). Size and shape measurement in contemporary cephalometrics. *Eur J Orthod* 25(3)*:*231-42.

Mejia-Maidl M, Evans CA, Viana G, Anderson NK, Giddon DB (2005). Preferences for facial profiles between Mexican Americans and Caucasians. *Angle Orthod* 75(6)*:*953-8.

Montini RW, McGorray SP, Wheeler TT, Dolce C (2007). Perceptions of orthognathic surgery patient's change in profile. A five-year follow-up. *Angle Orthod* 77(1)*:*5-11.

Orsini MG, Huang GJ, Kiyak HA, Ramsay DS, Bollen AM, Anderson NK, Giddon DB (2006). Methods to evaluate profile preferences for the anteroposterior position of the mandible. *Am J Orthod Dentofacial Orthop* 130(3)*:*283-91.

Perrett DI, Lee KJ, Penton-Voak I, Rowland D, Yoshikawa S, Burt DM, Henzi SP, Castles DL, Akamatsu S (1998). Effects of sexual dimorphism on facial attractiveness. *Nature* 394(6696)*:*884-7.

Polk MS, Jr., Farman AG, Yancey JA, Gholston LR, Johnson BE, Regennitter FJ (1995). Soft tissue profile: a survey of African-American preference. *Am J Orthod Dentofacial Orthop* 108(1)*:*90-101.

Proffit, W. R. (2000). Orthodontic diagnosis: The development of a problem list. In Proffit, W. R.,and Fields, H. W. (eds.) Contemporary Orthodontics, 3rd ed., p.148. St. Louis: Mosby.

Ricketts RM (1981). Perspectives in the clinical application of cephalometrics. The first fifty years. *Angle Orthod* 51(2)*:*115-50.

Soh J, Chew MT, Wong HB (2005a). Professional assessment of facial profile attractiveness. *Am J Orthod Dentofacial Orthop* 128(2)*:*201-5.

Soh J, Chew MT, Wong HB (2005b). A comparative assessment of the perception of Chinese facial profile esthetics. *Am J Orthod Dentofacial Orthop* 127(6):692-9.

Soh J, Chew MT, Wong HB (2007). An Asian community's perspective on facial profile attractiveness. *Community Dent Oral Epidemiol* 35(1):18-24.

Sorathesn K (1988). Craniofacial norm for Thai in combined orthodontic surgical procedure. *J Dent Assoc Thai* 38(5):190-201.

Spyropoulos MN, Halazonetis DJ (2001). Significance of the soft tissue profile on facial esthetics. *Am J Orthod Dentofacial Orthop* 119(5):464-71.

Türkkahraman H, Gökalp H (2004). Facial profile preferences among various layers of Turkish population. *Angle Orthod* 74(5):640-7.

Wuerpel EH (1937). On facial balance and harmony. *Angle Orthod* 7:81-89.

Yoon YJ, Kim KS, Hwang MS, Kim HJ, Choi EH, Kim KW (2001). Effect of head rotation on lateral cephalometric radiographs. *Angle Orthod* 71(5):396-403.

APPENDIX

ข้อมูลและรายละเอียดเกี่ยวกับการทำวิจัยที่ใช้ประกอบการพิจารณาเข้าร่วมโครงการ

(Inform Consent)

โครงการวิจัยนี้ เกี่ยวข้องกับความชอบรูปหน้าด้านข้างของแต่ละบุคคลโดยตั้งสมมติฐานว่า คนที่มีรูปหน้าต่างกัน จะมีความชอบรูปหน้าที่แตกต่างกัน *โดยเลือกผู้ป่วยของภาควิชาทันตกรรมจัดฟัน คณะทันตแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัยที่มีลักษณะใบหน้าสอดคล้องกับหลักเกณฑ์ในงานวิจัยดังกล่าว เป็นกลุ่มตัวอย่างหรืออาสาสมัครในงานวิจัยครั้งนี้*

วิธีการเลือกกลุ่มตัวอย่าง กระทำโดย นำภาพถ่ายรังสี (x-ray) ของผู้ป่วยก่อนการรักษาซึ่งผู้ป่วยได้ถ่ายไว้ในครั้งแรกก่อนการรักษามาวัดลักษณะรูปหน้าด้านข้าง และให้ตอบแบบสอบถาม ซึ่งกลุ่มตัวอย่างจะตอบในวันที่มีนัดกับทันตแพทย์จัดฟัน และต้องใช้เวลาตอบแบบสอบถามประมาณ 10 นาที

ผลที่ได้จากงานวิจัยชิ้นนี้ จะนำไปสู่การประเมินความชอบหรือไม่ชอบรูปหน้าที่แตกต่างกันโดยเปรียบเทียบระหว่างกลุ่มตัวอย่างที่มีรูปหน้าแตกต่างกัน และทันตแพทย์จัดฟัน และสามารถนำไปใช้ในการวางแผนการรักษาได้

การเข้าร่วมเป็นอาสาสมัครในโครงการวิจัยเป็นการเข้าร่วมโดยสมัครใจ และอาสาสมัครอาจปฏิเสธที่จะเข้าร่วม หรือสามารถถอนตัวออกจากการวิจัยได้ทุกขณะ โดยไม่ต้องได้รับโทษ หรือสูญเสียประโยชน์ซึ่งพึงได้รับ

ผู้กำกับดูแลการวิจัย ผู้ตรวจสอบ คณะกรรมการพิจารณาจริยธรรม และคณะกรรมการที่เกี่ยวข้องกับการควบคุมยา สามารถเข้าไปตรวจสอบบันทึกข้อมูลทางการแพทย์ของอาสาสมัครเพื่อเป็นการยืนยันถึงขั้นตอนในการวิจัยทางคลินิกและข้อมูลอื่นๆ โดยไม่ล่วงละเมิดเอกสิทธิ์ในการปิดบังข้อมูลของอาสาสมัครตามกรอบที่กฎหมายและกฎระเบียบได้อนุญาตไว้ นอกจากนี้โดยการเซ็นให้ความยินยอม อาสาสมัคร หรือผู้แทนตามกฎหมายจะมีสิทธิตรวจสอบและมีสิทธิที่จะได้รับข้อมูลด้วยเช่นกัน

ข้อมูลที่อาจนำไปสู่การเปิดเผยตัวของอาสาสมัคร จะได้รับการปกปิด และยกเว้นว่าได้รับคำยินยอมไว้โดยกฎระเบียบและกฎหมายที่เกี่ยวข้องเท่านั้น จึงจะเปิดเผยข้อมูลแก่สาธารณชนได้ ในกรณีที่ผลการวิจัยได้รับการตีพิมพ์ ชื่อและที่อยู่ของอาสาสมัครจะต้องได้รับการปกปิดอยู่เสมอ โดยมีข้อความระบุว่าอาสาสมัครหรือผู้แทนตามกฎหมายจะได้รับแจ้งโดยทันท่วงทีในกรณีที่มีข้อมูลใหม่ซึ่งอาจใช้ประกอบการตัดสินใจของอาสาสมัครว่าจะยังคงเข้าร่วมในโครงการวิจัยต่อไปได้หรือไม่

งานวิจัยนี้ ดำเนินการโดยทันตแพทย์หญิง เพกา จรุงกิจอนันต์ ในความควบคุมดูแลของ ผศ. ทพ. กนก สรเทศน์ หากอาสาสมัครท่านใดมีข้อสงสัย สามารถโทรศัพท์มาสอบถามได้ที่ 02-218-8754

อาสาสมัครที่คาดว่าจะเข้าร่วมในงานวิจัยนี้ มีจำนวน 60 คน

<u>เอกสารยินยอมเข้าร่วมการวิจัย</u> <u>(Consent Form)</u>

การวิจัยเรื่อง **รูปด้านข้างของใบหน้าที่ยอมรับได้ในผู้ป่วยจัดฟันไทยที่มีรูปด้านข้างของใบหน้าผิดปรกติ**

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย หรือจากยาที่ใช้ รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่างๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ

ข้าพเจ้าเข้าร่วมโครงการวิจัยนี้โดยสมัครใจ ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมในโครงการวิจัยนี้เมื่อใดก็ได้และการบอกเลิกการเข้าร่วมการวิจัยนี้ จะไม่มีผลต่อการรักษาโรคที่ข้าพเจ้าจะพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะเกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยได้เฉพาะในรูปที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่างๆ ที่เกี่ยวข้องกระทำได้เฉพาะกรณีจำเป็น ด้วยเหตุผลทางวิชาการเท่านั้น

ผู้วิจัยรับรองว่าหากเกิดอันตรายใดๆ จากการวิจัยดังกล่าว ข้าพเจ้าจะได้รับการรักษาพยาบาลโดยไม่คิดมูลค่า

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม.....ผู้ยินยอม

(.....)

ลงนาม.....พยาน

(.....)

ลงนาม.....พยาน

(.....)

ลงนาม.....หัวหน้าโครงการวิจัย

(.....)

วันให้คำยินยอมเข้าร่วมวิจัย วันที่.....เดือน.....พ.ศ.....

Facial Profile

<u>ส่วนที่ 1 ข้อมูลทั่วไป</u>

ชื่อ-นามสกุล_____เพศ ☐หญิง ☐ชาย

อายุ_____ วันเกิด_____

เชื้อชาติ_____ สัญชาติ_____

ระดับการศึกษา ☐ กำลังศึกษาอยู่ ☐จบการศึกษาแล้ว

☐ ประถมศึกษา ☐ มัธยมต้น ☐ มัธยมปลาย

☐ ปริญญาตรี สาขา_____ ☐สูงกว่าปริญญาตรี สาขา_____

อาชีพ_____

บ้านเกิดของบิดา (โปรดระบุเป็นจังหวัด หรือประเทศ)_____

บ้านเกิดของมารดา (โปรดระบุเป็นจังหวัด หรือประเทศ)_____

ที่อยู่ _____

_____

ท่านมีความเกี่ยวข้องกับวิชาชีพทันตแพทย์ในทางใดทางหนึ่งหรือไม่ (เช่น มีญาติพี่น้องเป็นทันตแพทย์ หรือตนเองเป็นทันตแพทย์)

☐ ใช่ อย่างไร โปรดระบุ_____

☐ ไม่ใช่

สาเหตุที่ท่านมาจัดฟันคือ (ให้เลือกข้อที่มีความสำคัญที่สุดเพียงข้อเดียว)

☐ ฟันเก ☐ฟันยื่น ☐ฟันห่าง ☐คางยื่น ☐คางเบี้ยว

☐อื่นๆ (โปรดระบุ)_____

<u>ส่วนนี้สำหรับทันตแพทย์จัดฟันของท่าน</u>

(กรณีที่ผู้ตอบแบบสอบถามเป็นทันตแพทย์ ให้ข้ามส่วนนี้ไป)

Treatment plan

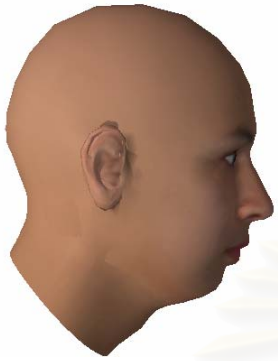
☐ extraction ☐ non-extraction

☐ surgery ☐ non-surgery

Beginning of treatment (date of first bracket placement) _____

<u>ส่วนที่ 2 การประเมินตนเอง</u>

1. รูปด้านข้างของใบหน้า 4 ภาพนี้มีความแตกต่างกันที่คาง จงเลือกว่าภาพใดมีลักษณะคางยื่น ภาพใดมีลักษณะคางหลุบ

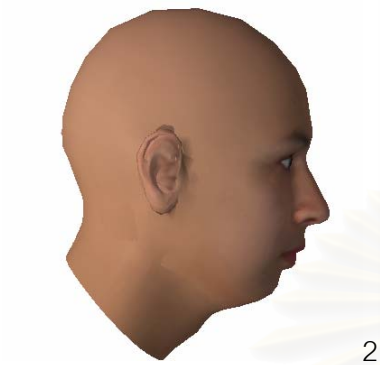
1  ☐ คางยื่น ☐คางหลุบ

2  ☐ คางยื่น ☐คางหลุบ

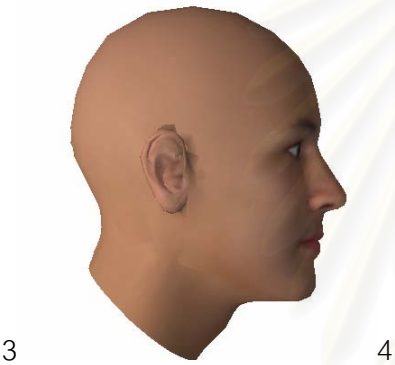
3  ☐ คางยื่น ☐คางหลุบ

4  ☐ คางยื่น ☐คางหลุบ

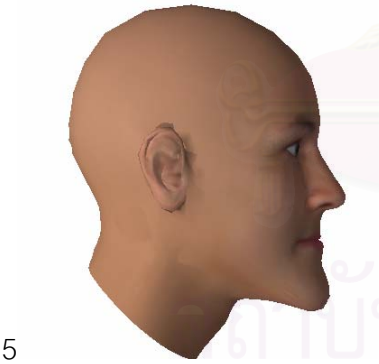
2. (ทันตแพทย์ ให้ข้ามข้อนี้ไป) ถ้ารูปด้านข้างของใบหน้าแบ่งออกเป็น 3 แบบ ดังภาพ จงเลือกรูปด้านข้างของใบหน้าหนึ่งภาพ ที่แสดงถึงตัวของท่าน

1 

2 

3 

4 

5 

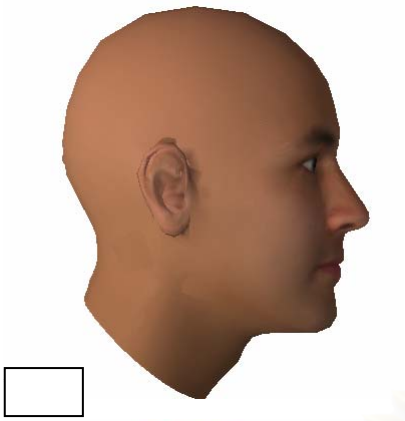
<u>ส่วนที่ 3 ภาพใบหน้าด้านข้างที่ยอมรับได้</u>

3. จงเลือกรูปด้านข้างของใบหน้านี้ ที่แสดงถึง**ลักษณะใบหน้าด้านข้างที่ท่านสามารถยอมรับได้** โดยใบหน้านั้น**ไม่จำเป็นต้องสวย** อาจดูผิดไปจากปรกติที่ท่านชอบ แต่ท่านมีความเห็นว่า **ไม่จำเป็นต้องรับการรักษา แก้ไข เปลี่ยนแปลง**

   ท่านสามารถ**เลือกจำนวนเท่าใดก็ได้ ไม่จำกัด**

   - รูปด้านข้างของใบหน้าที่แสดงถึง**<u>เพศชาย</u>**

ชุดที่ 1

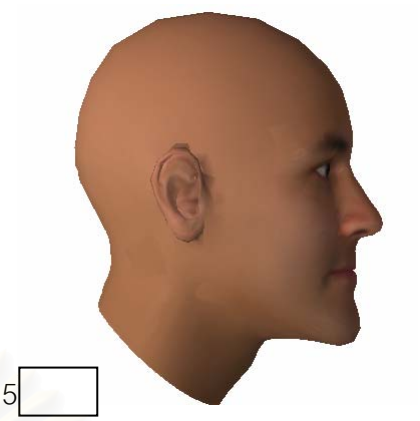


1 ☐

2 ☐

3 ☐

4 ☐



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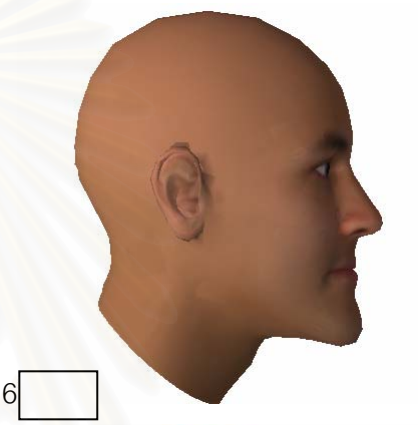
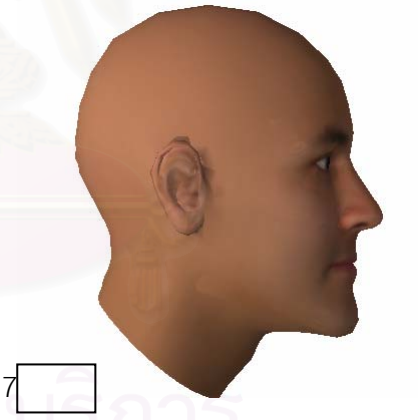


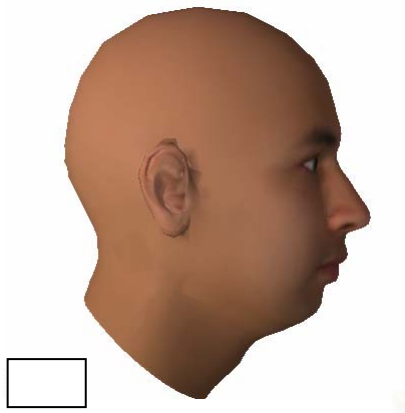
6 ☐



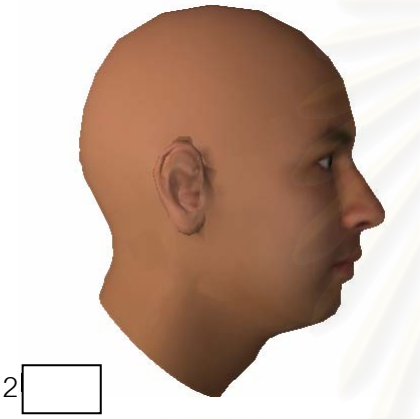
7 ☐

8 ☐

ชุดที่ 2



1 ☐



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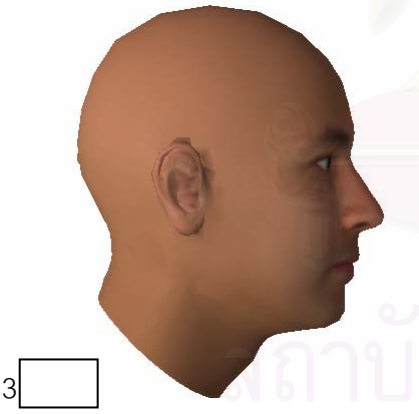
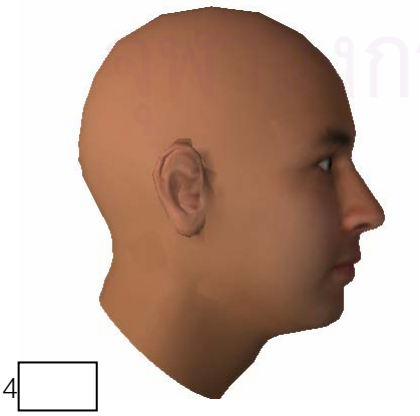


3 ☐



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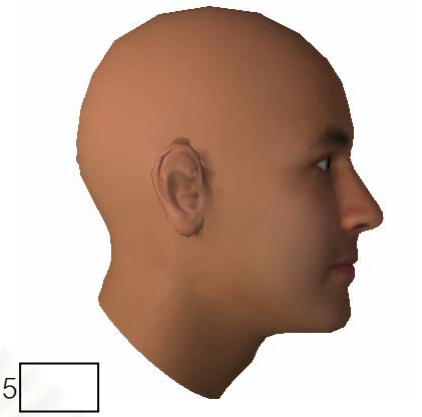

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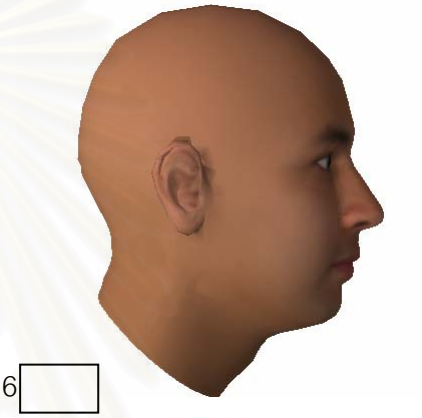

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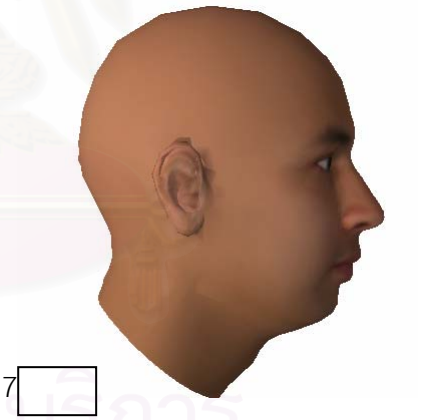

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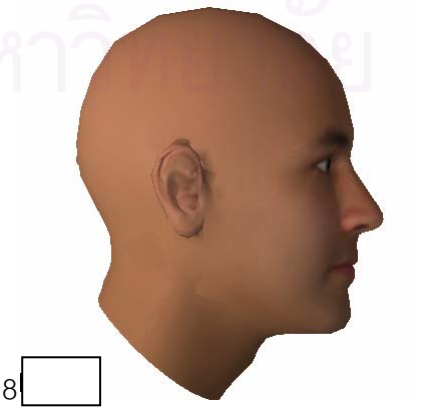
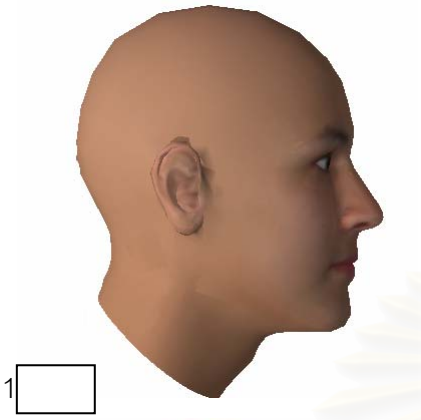


8 ☐

- รูปด้านข้างของใบหน้าที่แสดงถึง**<u>เพศหญิง</u>**

ชุดที่ 1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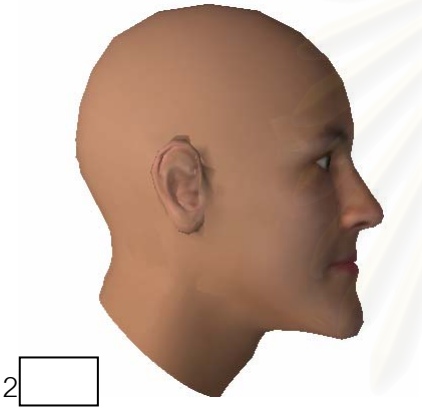
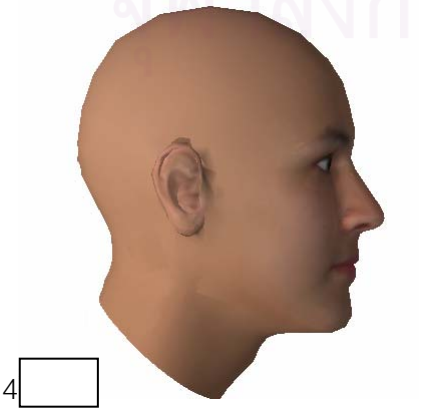

2 ☐


3 ☐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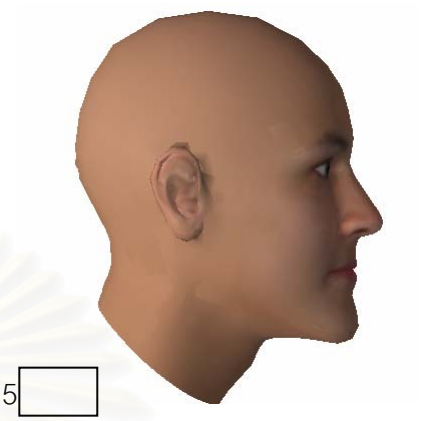
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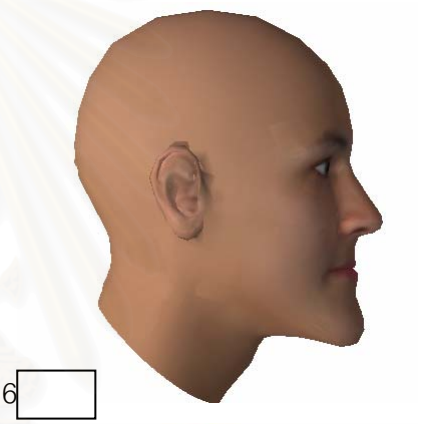
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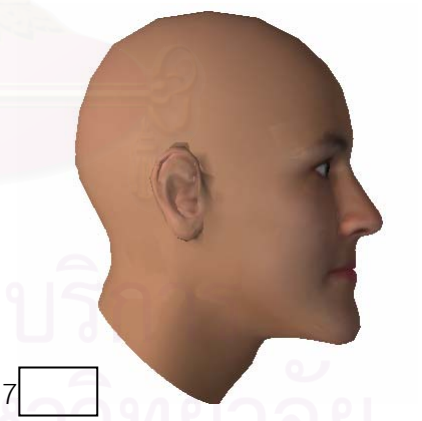
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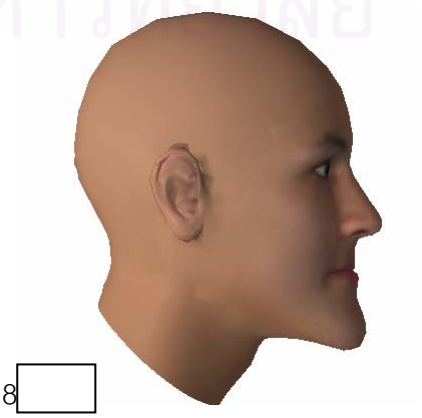
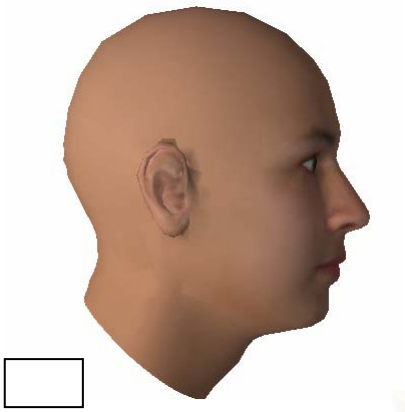
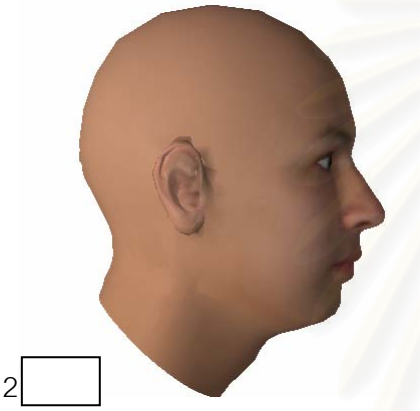

8 ☐

ชุดที่ 2

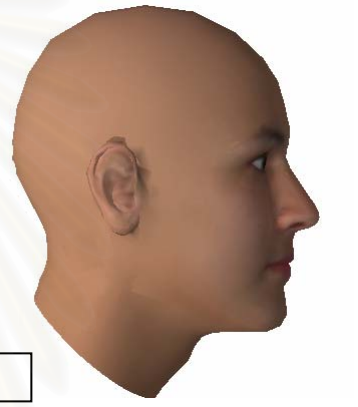


1 ☐

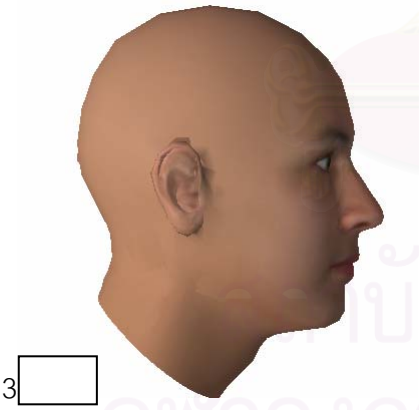
5 ☐



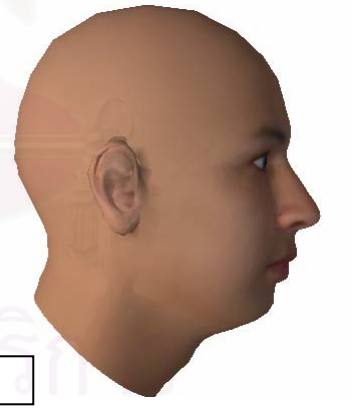
2 ☐



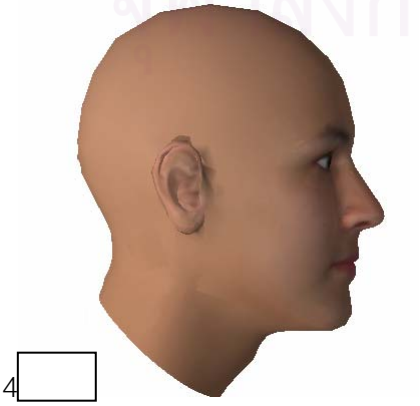
6 ☐



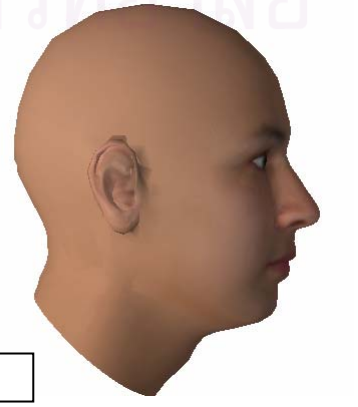
3 ☐



7 ☐



4 ☐



8 ☐

<u>ส่วนที่ 1 ข้อมูลทั่วไป</u>

ชื่อ-นามสกุล_____เพศ ☐หญิง ☐ชาย

อายุ_____

1. ท่านจบการศึกษาทันตแพทยศาสตรบัณฑิตจากสถาบันใด

   ☐ จุฬาฯ ☐ มหิดล ☐ เชียงใหม่ ☐ขอนแก่น ☐ สงขลาฯ

   ☐ นเรศวร ☐ มศว. ☐ อื่นๆ (โปรดระบุ)_____

2. ปีที่จบการศึกษาทันตแพทย์ศาสตร์บัณฑิต_____

3. ท่านได้ศึกษาต่อในสาขาทันตกรรมจัดฟันจากสถาบันใด

☐ จุฬาฯ ☐ มหิดล ☐ เชียงใหม่ ☐ขอนแก่น ☐ สงขลาฯ

☐ จากต่างประเทศ (โปรดระบุ)_____

☐ อื่นๆ (โปรดระบุ)_____

4. ท่านได้ศึกษาต่อในสาขาทันตกรรมจัดฟัน หลักสูตร ☐ ปริญญาโท ☐ วุฒิบัตร จบการศึกษาในปี_____

5. ท่านทำงานเป็นทันตแพทย์เฉพาะทางทันตกรรมจัดฟันเท่านั้น

☐ ใช่ ☐ ไม่ใช่

6. ท่านทำงานเฉพาะทางทันตกรรมจัดฟันมาแล้วกี่ปี

_____ปี

7. ท่านได้รับอนุมัติมัติบัตร สาขาทันตกรรมจัดฟันหรือไม่ ☐ ได้ ☐ ไม่ได้

8. ปัจจุบัน ในกรณีที่มีผู้ป่วยต้องรักษาด้วยการจัดฟันร่วมกับการผ่าตัดจัดขากรรไกร (Orthognathic surgery) ท่านทำอย่างไร

☐ ให้การรักษาทางทันตกรรมจัดฟันด้วยตนเอง ☐ส่งต่อให้ทันตแพทย์ท่านอื่น

☐ ไม่เคยเจอผู้ป่วยลักษณะนี้

Statistic Tables

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.132(b)	1	.144		
Continuity Correction(a)	.935	1	.334		
Likelihood Ratio	3.563	1	.059		
Fisher's Exact Test				.327	.171
Linear-by-Linear Association	2.104	1	.147		
N of Valid Cases	77				

a Computed only for a 2x2 table
b 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.48.

Table 4 shows comparison between the reproducibility between subjects and orthodontists in the first level.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.114(b)	1	.024		
Continuity Correction(a)	3.821	1	.051		
Likelihood Ratio	6.363	1	.012		
Fisher's Exact Test				.030	.019
Linear-by-Linear Association	5.048	1	.025		
N of Valid Cases	77				

a Computed only for a 2x2 table
b 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.69.

Table 5 shows the comparison between reproducibility between subjects and orthodontists in the second level.

Biography

Miss Paega Jarungidanan was born in Bangkok on July 9th, 1981. She graduated from faculty of Dentistry, Chulalongkorn University in 2004 with first class honor and has maintained private practice ever since. She pursued graduate study in Master of Science (Orthodontics) at faculty of Dentistry, Chulalongkorn University in 2006.