

# Role of underlying skeletal structures health and social care essay



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CHAPTER ONE INTRODUCTION Background Orthodontic diagnosis, treatment planning and prognosis are considerably related to dento-facial esthetics with muscular balance and harmony of the dental arches keeping in mind. A primary objective of orthodontic treatment is to provide the patient with a satisfactory esthetic outcome. The role of underlying skeletal structures in influencing facial form has been widely recognized by dental professionals. However, one must not underestimate the importance of the soft tissue covering the bony surfaces of the face which plays an important part in facial muscular balance and esthetic harmony. The subject of esthetics is preeminently important to orthodontists. Orthodontics has begun to emphasize dentofacial esthetics in addition to functional occlusal relationships. The orthodontic literature reflects the clinical challenge of understanding and communicating esthetics between clinicians and patients, particularly when both parties do not share the same concern. Esthetic perception varies from person to person. Although subjected to the same environmental trends and perspectives, educational experiences might bias the esthetic preferences of dental professionals away from those of the public. Thus dentists are obliged to understand beauty, harmony, balance and proportion as perceived by society while treatment planning. (Peck and Peck, 1970) Well balanced and harmonious facial structures are essential consideration of orthodontic diagnosis and treatment planning. Harmonious facial esthetics and functional occlusion have long been recognized as two vital treatment outcomes. Judgment of facial esthetics is subjective and depends on various cultural, social, geographic and psychological backgrounds of people. Orthodontists should always consider these variables while making diagnosis or formulating treatment plan. Soft tissue analysis is <https://assignbuster.com/role-of-underlying-skeletal-structures-health-and-social-care-essay/>

the most critical means of interest in the development and selection of a potential orthodontic treatment plan. (Mandall et al, 1999) Soft tissue profile has been extensively studied in orthodontics primarily from lateral cephalograms. The pioneers in the field of orthodontics such as Angle advocated non-extraction therapy even though it had certain challenges of not being able to achieve a straight or a slight concave profile. Similarly, Holly Broadbent in 1931 introduced the use of X-ray technique in cephalometric tracing and evaluation. Tweed (1944) investigated the importance of esthetics by using cephalometrics standards in a study of 95 patients with good facial esthetics. This paved way for advanced research works in the area of cephalometric analysis and facial esthetics. In recent years, significant amount of research are being devoted to various aspects of perception including the influence of culture, age and the biological basis of face recognition and feature discrimination. The perception of facial attractiveness is multifactorial and founded primarily on genetics, culture and environmental factors. The subjective nature of facial beauty is best illustrated by the writer Margaret Hungerford's classic statement " Beauty is in the eye of the Beholder" (1878). The perceptual judgment of facial esthetics is based on a ' sense' which is largely independent of intellectual input yet takes into consideration the influence of specific facial features. Philosophical debate therefore varies between those embracing the universal nature of beauty and those who believe that the perception of beauty and those who believe that the perception of beauty is very much an individual assessment strongly influenced by one's own ideas and feelings. Lately, considerable focus has been shifted to the soft tissue facial covering the hard tissue skeleton during orthodontic diagnosis and treatment planning.

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The creation of a well balanced soft tissue profile is now accepted as an important goal of orthodontic treatment (Profitt et al., 2003). The purpose of this study is to assess the perception dental patients' esthetic profile among people of diverse culture and educational background in a Chinese community.

**Statement of the Problem**The main intention with which patients come to seek orthodontic treatment is improvement in facial appearance and well aligned teeth. In view of this, it is essential for orthodontists to have evidence-based knowledge regarding what is deemed pleasant and harmonious to patients and clients who seek their services. The views and ideas of ideal facial harmony should be universal, so that, dental professionals can more efficiently cater to the esthetic demands of the society. It is therefore needful to have scientific information concerning how people of different walks of life and ages perceive facial beauty. Hence, making this research very imperative.

**Aim of the Study**The purpose of this study is to assess the perception dental patients' esthetic profile among people of diverse culture and educational background in a Chinese community.

**Specific Objectives**1)To determine the validity of Ricketts E line and Holdaway H line. 2)To evaluate the result of conventional cephalometric analysis in determining soft tissue facial esthetics.

**Significance of the Study**First of all, the findings of this study would enable people especially dental professionals to know whether or not people with different professional background and in a diverse culture hold similar point of view regarding facial appearance and beauty. Furthermore, it would provide information indicating whether or not the perceptions of facial beauty that ordinary people share correspond to orthodontists. This information would go a long way in shaping the decisions of orthodontist and make them offer

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cost-effective and satisfactory treatments to their patients and clients.

Lastly, the results of this study would also allow dental professionals to acknowledge whether there is any association between the subjective perceptions of beauty and scientifically acquired objective assessment of facial beauty. Definition of Terminologies(a)Facial esthetics: The probable scientific explanations for facial beauty are in terms of ideal proportions, bilateral symmetry and sexual dimorphism. (Naini, 2011)(b)Perception of facial esthetics: The perception of facial esthetics can be influenced by the frequency a particular facial pattern is observed and perceived as being "correct" (Peck and Peck, 1970)Overview of MethodologyA cross-sectional study design was used. Pre-treatment profile photographs of selected patients were given to 5 groups of participants: dental professionals (n= 10), dental patients (n= 10), dental students (n= 10), non-dental students (n= 10) and laypersons (n= 10). The participants were asked to evaluate each photograph and answer the questionnaires provided along with it.

Organization of the workThis paper is divided into 6 main chapters. Chapter 1 gives a brief introduction about the background of the research, problem statement, aims and specific objectives of the study. The importance of the study is also stated and a concise overview of the methodology is presented. Chapter 2 describes the materials and methods in detail. The study design, sample selection, data collection procedures are explained. Statistical analysis also mentioned. Chapter 3 reports the results and findings of the study. Chapter 4 presents the discussions of the results. Chapter 5 gives the conclusions arrived in the study. Chapter 6 shows a detailed review of related literature. CHAPTER TWO MATERIALS AND METHODS Study

PopulationThe study was conducted on five different groups of people with <https://assignbuster.com/role-of-underlying-skeletal-structures-health-and-social-care-essay/>

diverse background and culture. A total of 50 individuals participated in the study. These were;(a)Dental Professionals, practicing orthodontics and endodontics(b)Dental Patients(c)Laypersons(d)Non-dental students(e)Dental studentsEach of the five groups was made up of 10 individuals of different ages and gender. The study was done over a three month period. SettingThe study site was the Xiangya School of Stomatology, where dental patients receive dental treatments on daily basis. This Hospital is located at the Furong road within the city of Changsha in the Hunan Province of China. Inclusion criteriaDental practitioners, patients, laypersons, dental students and non-dental students who volunteered to be part of this work participated in the study. Exclusion criteria(a)Non dental patients(b)Medical doctors(c)Minors who could not express clearly their perception of patients' esthetic profile were excluded from the studySample sizeThe sample size consisted of 50 participants who satisfied the inclusion criteria. These individuals were identified for data collection. Study designThe research design was a cross sectional survey which took the form of a prospective study over a three-month period. Sampling techniqueA convenience sampling technique was used in this study. Participants were given structured questionnaires with photos to complete. The Principal investigator helped participants to complete the given questionnaires properly. Instruments for data collection(a)Standard X ray machine: Satellac company made; for obtaining lateral cephalograms.(b)Cephalometric software: Onyx to analyze the lateral cephalograms.(c)Nikon D 70 S DSLR digital camera.(d)Microsoft Windows 7 desktop computer. Procedure for data collectionThe investigator made initial contacts with participants by telephone and personal contacts to seek consent and ensure participation. Upon agreement, a written informed

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consent was obtained. Participants received full explanations of the purpose of the study and the benefits of participation. Information on the participants' perception on selected photos of dental patients were obtained using a structured questionnaire. The participants were monitored over the study period to ensure they stated their opinions clearly and correctly. Each questionnaire was divided into three sections; section A was on demographic data including age, race, marital status and education background. Section B sought information about the selected photos that were presented to the participants. Further information was sought as to whether the photos were attractive or not. Section C sought information about the influencing factors that informed participants' decision regarding the classification of the photos. Participants were made to provide reasons for classifying a photo as attractive or not. Statistical Analysis Data were entered into a database and analyzed statistically using the Statistical Package for Social Sciences (SPSS) version 18.0. Descriptive statistics of frequency distributions, means and percentages were used to represent the data obtained. Spearman rank correlation coefficients were used to determine the similarity between the perceptions of study sample. Rank scores given by dental professionals, dental and non-dental students, dental patients and lay persons for each photograph were compared with Kruskal-Wallis tests. All means were reported in plus or minus the standard deviation (SD) unless otherwise stated.  $P < 0.05$  was established as the level of significance.

CHAPTER THREE RESULTS Demographic Characteristics of Participants Table 1 below shows the demographic characteristics of participants. Over a three-month period, 50 participants (Male= 22, Female= 28) were recruited to participate in this study. Their ages ranged from 16 to 48 years, with a mean age  $\pm$ SD

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of 26.  $16 \pm 9$ . 20. Majority, 72% (36/50) of the participants were Asians.

**Distribution of Study Groups** Figure 1 below displays the distribution of study participants. The participants consisted of 20% (10/50) dental professionals, 20% (10/50) patients, 20% (10/50) laypersons, 20% (10/50) non-dental students and 20% (10/50) dental students.

**Classification of Esthetic Profile by study Participants** The classification of esthetic profile into straight and non-straight profile by study participants is shown in Table 2. Majority, 54% (27/50) of the participants classified the photos into non-straight profile

whereas only 46% (23/50) classified the photos into straight profile. Factors influencing Participants' Profile Classification Table 3 indicates the factors that influenced participants' perception of beauty. These factors enabled

them to categorize selected photos into either straight or non-straight profiles. Nose was the highest determining factor 30%, followed by a combination of upper lip, lower lip and chin representing 24%. The least influencing factor was lower lip only which accounted for 4%. Table 1:

**Demographic Characteristics of Participants (n= 50)**

Study groups	Variables	DP	DPT	LP	NDS	DS	Age (years)
		44.00	$\pm 4.22$	19.30	$\pm 3.50$	34.50	$\pm 11.90$
		26.40	$\pm 9.63$	26.30	$\pm 8.90$		
	Gender (%)	Male	40	30	40	60	50
		Female	60	70	60	40	50
	Race (%)	Asians	100	100	100	0	60
		Arabs	0	0	0	90	30
		Others	0	0	0	10	10

DP: Dental Professors, DPT: Dental Patients, LP: Laypersons, NDS: Non Dental Students, DS: Dental Students

**Distribution of subjects based on Gender** Distribution of study subjects based on the race Figure 1: Distribution of Study Groups (n= 50)

**Table 2: Classification of Esthetic Profile (n= 50)**

	Straight Profile	Non-Straight Profile	Total Percentage



(%)

Study Groups Dental Professors 3 7 10 20. 00 Dental Patients 4 6 10 20.

00 Laypersons 8 2 10 20. 00 Non-Dental Students 3 7 10 20. 00 Dental

Students 5 5 10 20. 00 TOTAL 23 27 50 100. 00 Table 3: Factors influencing

Participants' Profile Classification (n= 50) Factors Number of Participants

Percentage

(%)

Nose 15 30. 00 Forehead 8 16. 00 Chin 3 6. 00 Upper lip only 6 12. 00 Lower lip

only 2 4. 00 Combination of upper and lower lip 4 8. 00 Combination of upper

lip, lower lip and chin 12 24. 00 TOTAL 50 100. 00 CHAPTER

FOUR DISCUSSION CHAPTER FIVE CONCLUSION Limitations of the Study The

sample size was comparatively small, which means the results may not

correspond to the opinion of larger population. CHAPTER SIX LITERATURE

REVIEW Overview Esthetics has always been a very interesting and intriguing

factor influencing every aspect of life. Since time immemorial, there have

been trials and records, where humans have continuously made efforts to

quantify the word " Beauty" in layman's terms. In view of understanding

esthetics in better prospects, innumerable studies and researches are

performed, based on every possible available platform which will help us to

improve and achieve the most acceptable esthetic values. Modern society

places a strong emphasis on attractiveness and particularly facial

attractiveness. It has been shown that people with attractive features are

regarded socially more competent, successful and likable. However, esthetic

perception varies from person to person and is influenced by their personal

experience and social environment. " Beauty lies in the eyes of the Beholder"

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and this statement holds good when the patients treated by orthodontists comprises the society and everyone's perception about esthetics matters. Since the patient's decision to undertake orthodontic treatment is based primarily on esthetic considerations, the evaluation and understanding of the factors that influence their decision is of key importance. Therefore the soft tissue covering the skeletal bases also have to be evaluated when the overall treatment is being considered. In some cases even though ideal occlusion could be achieved with orthodontics alone, an orthodontic-surgical treatment plan is recommended because of an opportunity to improve profile esthetics. The choice depends on the severity of the skeletal problem present and the facial and the dental esthetic improvements anticipated. Orthodontics has very large impact on the esthetics of the lower half of the face. Therefore, it is important for clinicians to understand what people perceive as attractive so that the patients can be treated to appropriate treatment goals. During treatment planning, orthodontists often emphasize on profile esthetic outcomes. Orthodontists have a significant influence on patient's decisions regarding which treatment plan to choose. Patients may be persuaded to undergo orthodontic and surgical treatment based on the professional judgment of their clinician. However, a patient's perception of an attractive profile may differ from the clinician's perception and the desirable treatment outcome in terms of facial esthetics is determined by the public's concept of beauty. A study involving people from different professional backgrounds for the perception of beauty can find how well we are communicating with the general population regarding profiles and what is in the mind of public regarding profile. Therefore it is imperative to understand the views about esthetic perception amongst people with varying

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backgrounds who constitute our society. The perception of beauty also varies in different ethnic groups. With globalization and increasing migration of people to different countries of the world, it is a challenge to the orthodontists to fulfill the patients' esthetic requirements on the basis individual, ethnic and social needs. This chapter shall provide detailed review of previous studies that have been carried out to investigate esthetics and factors influencing it as well as subjective perception of people. What exactly is perception? Technically, perception is a single, unified awareness derived from sensory processes while a stimulus is present. Psychologists say that our perception of forms depends on the development of "form concepts". For example in dental training the concept of occlusion hinges on the concept that the maxillary teeth are observed above the mandibular teeth. Any departure from this orientation is confusing. Form concepts, likewise, influences the perception of faces. Its universal rule that, the more frequently we observe a particular facial pattern, the more likely we perceive it as correct and acceptable. Orthodontists, too, can be victimized by what is called selective conditioning. Selective conditioning makes people believe in presumptive judgments in their perception of faces. The orthodontists should play a decided role in determining the esthetic destiny of a patient's face. There is a tendency of the dentists to dominate the esthetic considerations of particular treatment without asking the patient's family perception of esthetic viewpoint. Hence researches are carried out to acknowledge patient's, patient's kin and laypeople esthetic considerations. Wendell Wylie remarked that the layman's opinion of the human profile is every bit as good as the orthodontist's and perhaps even better since it is not conditioned by orthodontic propaganda. History of perception of esthetics

Man perhaps  
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subconsciously, has been aware of facial esthetics for a long time. Facial attractiveness is very important in inter human communication. Beauty means social power and success and has a positive influence in all areas of civilized society. The ancient Egyptians (5000 BC) were possibly among the first to deal with harmonious (attractive) proportions of the face and body. The Egyptian ideal of beauty and harmony is reflected in the monuments and sculptures from that time (King Mycerinus, Queen Nefertiti). In ancient Greece, Apollo Belvedere and Aphrodite of Melos represented the ideal facial proportions because they were perceived by the sculptors in the fourth century BC. Influenced by the thinking of Pythagoras, the concept of the so-called "Golden" or "Divine" proportions developed in the fifth and sixth century BC and was described for the first time by Euclid in his book (Element II). The Greek philosophers, notably Plato and Aristotle, questioned the intrinsic meaning of beauty and introduced "aesthetics" as both the study of beauty and the philosophy of art. Plato asserted that the qualities of measure and proportion invariably constitute beauty and excellence. Aristotle's concepts of the formal nature of beauty were premised largely on Plato's original thoughts. The philosophers felt that beautiful creations respected certain geometrical laws, since true beauty necessarily displayed "harmony". The formalized studies of psychology and sociology have helped transform esthetic judgment from simply a visual "feeling" to an understanding exercise in visual perception. While the study of face as the "esthetic stimulus" is still important, of equal significance now is the nature of the "esthetic response" to the observer's perception. Ethnicity and the perception of estheticsA key question that has been asked by orthodontic researchers relates to the influence of culture on the perception of facial

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aesthetics. The orthodontic literature provides many examples of attempts to compare and contrast the perceptions of facial aesthetics between various populations. Foster investigated the perception of facial profile aesthetics of general dentists, art students, orthodontists, African Americans and Chinese Americans. The silhouetted profile of an 18-year-old Caucasian girl was used and seven profiles were constructed from this baseline profile by varying the lip position in 2-mm increments from Ricketts' E-Plane. 7 Each test subject was given a booklet containing a set of seven profiles and were requested to choose what they considered was the most attractive profile given that the group of profiles could be male or female, 8-years-old, 12-years-old, 16-years-old or adult. General trends were observed, including an overall preference for fuller profiles in younger patients, fuller profiles for adult females compared with adult males, and all groups preferring a more retrusive lip position in adult males. Foster noted a commonly shared aesthetic standard for most cases, although, in his discussion he identified some key concerns. Specifically, he found that the template photo that he based his profile variants on presented with a lower lip that was more prominent than that which would be considered ideal. He hypothesized that variation between a subject's appreciations of aesthetics and facial harmony might be a manifestation of different mass media influences on a given individual's perception of beauty. ( Foster E. J., 1973) De Smit and Dermaut (1984) investigated three variables of soft-tissue facial profile characteristics, focusing on anteroposterior maxillomandibular relationships combined 3mm with lip position, lower face height and the form and curvature of the dorsum of the nose. Cameo profiles were presented to groups of subjects with and without orthodontic backgrounds. The profiles were force ranked by subjects

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on the level of attractiveness. The authors found no differences between subjects with orthodontic knowledge and subjects without orthodontic knowledge, nor did gender affect the rank order. Class I mesognathic profiles were the most appreciated type of profile, with Class I brachyfacial profiles following a close second. The Class III open bite profile was least preferred across all groups. Hall et al. 2000 investigated the perception of African Americans versus Caucasian Americans that were asked to evaluate 60-silhouetted profiles. Twenty Caucasian orthodontists, 18 African American orthodontists, 20 Caucasian laypersons and 20 African American laypersons were asked to evaluate profile silhouettes of Caucasian and African Americans using a 10cm visual analogue scale. The silhouettes were constructed from cephalometric radiographs provided by the orthodontic department at the University of Alabama and represented a wide range of maxillomandibular relationships and soft tissue presentations. Although all the profiles were silhouetted, the subjects were made aware of the ethnic background for each tracing. The authors observed that greater convexity was preferred for African American profiles compared to Caucasian profiles. Furthermore, subjects with African American background preferred greater lip prominence compared with their Caucasian counterparts. Nomura et al. 2009 investigated the aesthetic preferences of European American, Hispanic American, Japanese, and African laypersons. Independent panels of 30 lay observers were asked to evaluate sets of 10 profiles (5 males and 5 females) representing European American, Japanese and African skeletal Class I and Angle Class II profiles. 20 Profiles were selected from records of patients between the ages of 18 and 35 at the orthodontic clinics of the University of Texas Health Science Center and the Tokyo Dental College. Lip positions

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were digitally manipulated from Ricketts' E-plane in 2-mm increments (-8mm to +4mm). Nomura et al. ascertained that all groups preferred more retruded lip positions, with the African panel preferring the least retrusive of the four groups. A statistically significant difference was recognized between the African panel and the more retrusive preferences of both the Hispanic and the Japanese groups. Hockley et al. (2012) investigated whether subject preferences were affected by the method of presentation of various profiles with differing amounts of lip protrusion. The authors looked at whether subjects would respond differently to profiles in silhouette versus photographic images. Twenty African American patients (10 male, 10 female) were selected. Using averages for African American lip positions, images were altered in 2mm increments to construct profiles with varying degrees of lip protrusion. Seven images per profile were created, totalling 140 images. The images were duplicated and silhouetted. 280 profile images subdivided into 40 groups of seven images were evaluated. Fifteen orthodontists and orthodontic residents were asked to select the most ideal image from the series of profiles for each of the 40 groups. Flatter profiles with less lip projection were preferred in silhouette when compared with photographs, with a general trend to accept a flatter profile regardless of presentation method. The authors reported that the subject panel consisted exclusively of Caucasian orthodontists and orthodontic residents. This makes any generalizations to other ethnic groups impossible. Each of the above studies applied different methodological approaches to investigate the impact of ethnicity on aesthetic perception. Each study observed interesting trends, and furthered the orthodontic knowledge-base as it pertains to aesthetics and ethnic influence. Yet, in defining the test groups, each of

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these examples applied attribute- and geographic based definitions of ethnicity, or lacked external validity. Categorical classification is unavoidable in a culturally-based study. The question arises here whether it is appropriate to define ethnicity with geographic or physical parameters.

Edward J Foster (1973) studied esthetic preferences in six diversified group which included general dentists, orthodontists, art students, a Chinese lay group, an African lay group and a white lay group. Participants were asked to choose the most pleasing profile at different ages at eight, twelve, sixteen and adult. Seven silhouette drawing were same except for the position of the lips which was advanced at 2mm stage and the full lip was 12 mm protrusive to the straight face. Steiner's S line, Rickett's E line and Holdaway H line were used to estimate the protrusion of the lips. Results indicated that the diversified groups seemed to have common esthetic standards for the posture of the lips and fuller lips was preferred for younger ages. Sex differences are clearly defined at the adult stage. A straighter adult face for male was preferred which indicated that orthodontists may have to establish a straighter value for the adult male soft tissue profile. Jen Soh et al (2005) compared the perception of male and female Chinese facial profile esthetics between dental professionals, dental students and lay persons. The study included the profile photograph of a Chinese male and female with a class I relationship dental and skeletal pattern and the image was digitized to have seven variations namely(1) Bimaxillary protrusion, (2) protrusive mandible, (3) retrusive mandible, (4) normal profile (Class I incisor with Class I skeletal pattern), (5) retrusive maxilla, (6) protrusive maxilla, and (7) bimaxillary retrusion. Chinese male and female profiles that were normal or had

bimaxillary retrusion were perceived to be highly attractive by dental  
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professionals, dental students, and laypersons, and profiles with a protrusive mandible were perceived to be the least attractive. All three groups had similar opinion while judging the female profiles. Eugene KM Chan et al (2008) conducted a research which established a baseline data for the treatment planning concerning patients of different ethnic group. They modified one male and one female photograph into seven profile variations and the photographs were judged by white examiners categorised into orthodontists, dental students and laypersons. Bimaxillary retrusive and Class I normal profile was preferred the most whereas the least attractive was the protrusive mandible for the male profile. Protrusive and retrusive mandible was the considered the least attractive for the female profile. All three groups demonstrated similar trends in ranking the profiles. The upper lip, lower lip and the chin were determinant factors for ranking the profiles. Maria Fernanda Quiroz et al (2012) studied the esthetic perception of orthodontists, oral surgeons and patients. Normal profile and bimaxillary retruded profile were deemed as the most attractive. Mandible protrusion profile was considered as the least attractive. Female bi maxillary protrusion was accepted better than the male counterparts. There was high correlation amongst the three groups while scoring female profiles and had similar perception for different male and female profiles. Anthony L. Maganzini, James Y. K. Tseng et al (2000) studied perception of facial esthetics by native Chinese participants of Beijing. A male and female profile was modified by computer into 4 other digitised distortions namely 1) Bi dental retrusion 2) Maxillary deficiency 3) Mandibular prognathism 4) Mandibular deficiency. In the research, the bi dental retrusion profile was equally acceptable as the original stimulus profile in male and mandibular prognathism, retrognathism

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was equally unacceptable, where as in female profile; maxillary deficient profile was ranked the most attractive and deficiency was considered least attractive. A pilot study conducted by Yi Jyun Chen, Tsui Hsueng Huang et al (2007) included dental students completing a survey to determine and compare the esthetic perception of ethnic Chinese population in Taiwan. A straight profile and a protrusive maxilla for both the gender was scored to be the most attractive. Protrusive mandible and retrusive maxilla were considered least attractive in female profile group; whereas protrusive mandible and bimaxillary protrusion was deemed to be the least attractive in male profile group. In all, a class III profile was considered the least in both Chinese adult males and females. A bimaxillary protrusion as better perceived in female profiles than in male profiles. Eser Tufekci, Arousha Jahangiri et al (2008) carried out a research on the perception between lay people, dental students and dental patients. Subjects were given class I, II and III profile silhouettes and were asked to select the profile which resembled themselves the most. Orthodontic patients were more conscious of their dental esthetic appearance. Individuals who considered themselves as Class II or Class III were not satisfied with their appearances. Subjects with dental education were more aware of dental esthetics than other groups. In a survey conducted by Sulaiman E et al (2001) among Saudi Arabian patients with dento-facial deformity to self perception of their profile and to correlate the finding with their educational level, social status, gender, chief complaint, type of dento-facial deformity and the degrees of patients' agreement to undergo orthognathic surgery. About one third of the patient could perceive their profile correctly. There was a positive correlation between higher educational level and self perception of profile, leading to

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high demand of orthognathic surgery than the low education level group. Class III profile patient group expressed higher demand for surgical correction. Hakan Turkkaraman et al (2003) determined general esthetic preference of a Turkish population and correlated the preference with the gender, age, education and geographic location. Orthognathic profile was most preferred and retrognathic profile was least preferred by both the sexes. Adolescents chose orthognathic profile with prominent dentoalveolar structures where as adults chose orthognathic profile alone. High school and university graduates preferred the orthognathic profile and primary school preferred a profile where mandible was slightly retruded. Racial differences

Most of the previously cited studies use Caucasian subjects to establish norms, or are based on ideal Caucasian standards. One must question how well these ideal values apply to other races and ethnicities - specifically for soft tissue profile measurements. Numerous studies have compared their target population with white subjects. Satravaha and Schlegal (1987) compared 180 Thai subjects to Caucasians using a variety of analysis. In a general soft-tissue profile convexity analysis using soft-tissue nasion, subnasale, and soft tissue pogonion, the Asian population (165 degrees) was found to have a significantly less convex soft tissue profile than Caucasians (161 degrees). Additionally, they reported that the nasolabial angles of their subjects were approximately 20 degrees larger than the Caucasian ideal of 74 degrees advocated by Burstone (1967). The authors encouraged more studies of different ethnic groups for diagnostic aids in treatment planning. Alcade et al. (2000) compared 211 Japanese female adults to a white adult sample. Several significant differences were found. Ricketts E-lane showed the Japanese had a more prominent lower lip

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in a closed position the whites. A Holdaway analysis of the Japanese demonstrated that the Japanese had a less prominent nose, greater upper lip curvature, a less convex skeletal profile, larger upper lip strain, a lower lip in a more anterior position and a thicker soft tissue chin. Soft tissue analysis showed larger upper lip length, a larger interlabial distance, prominent lips and a retruded chin. The authors emphasized cephalometric norms are specific for ethnic groups and that soft tissue values should be an aid in treatment planning, not treatment goals. Erbay, Caniklioglu et al. (2002) analyzed 96 Turkish adults using a variety of soft tissue analyses. They found that Turkish adults had retrusive upper and lower lips compared to norms of Steiner and Ricketts. However, according to Burstone's B line, the Turkish lips were within normal range. The upper lip was protrusive and the lower retrusive compared to the Sushner norms for a black population. Nasal prominence was greater than Holdaway's norms. The authors noted that soft tissue analysis differs according to population because each race has its own characteristics. Basciftci, Uysal and Buyukerkmen (2003) examined 175 dental students at Selcuk University in Turkey in order to determine Holdaway soft tissue standards for Turkish adults. They analyzed ten linear and two angular measurements for each subject. Most soft tissue measurements were similar to the established Holdaway values. However, it was found that mean soft tissue chin thickness was 12.96 mm, which was slightly larger than the Holdaway norm of 10-12 mm. Additionally, basic upper lip thickness was 16.64 mm, compared to the Holdaway norm of 15mm. With these findings in mind, the paper concluded that differences should be considered when diagnosing and treatment planning for patients of different ethnicities. Uysal et al. (2009) analyzed 133 cephalometric

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radiographs to establish standards of the soft tissue Arnett analysis for surgical planning in Turkish adults. All subjects were selected because they had normal antero-posterior and vertical skeletal relationships. The Arnett analysis was performed on each subject and a variety of differences were identified. Most of the Turkish means were within Arnett's standards. However, the Turkish population had less lower lip thickness, more menton thickness, depressed orbital rims, cheek bones, thin lips and retruded incisors. From this, the authors recommended that differences between ethnic groups should be considered when treatment planning for patients with dentofacial deformity. Even within one ethnicity or race, differences may be detected in subgroups. Scavone et al. (2008) compared profiles of white Brazilians to white Americans. 30 Brazilian men and 29 women were compared to 20 American men and 26 women. All subjects were required to have normal occlusions and balanced faces. A true vertical line with measurements to soft tissue points was used to assess many of the facial features. Additionally, the nasolabial angle was assessed. The Brazilian women were found to have a smaller nasal projection, less full lips, a more obtuse nasolabial angle, and less projection of the chin and soft tissue B point. The Brazilian men had more in common with their American counterparts; however they did have a smaller nose projection. They concluded that one standard is not applicable to diverse white populations. Al-Gunaid et al. (2007) showed that soft-tissue profiles of white Yemenis and American differ in certain aspects. They looked at 50 Yemeni men with normal occlusion and analyzed them according to the Holdaway and Legan-Burstone analyses. In the Yemini group, the chin neck angle was more obtuse, the mentolabial sulcus depth was deeper, and the interlabial gap

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was shorter. Additionally, the skeletal profile convexity and upper-lip thickness were larger than the values recommended by Holdaway. They concluded that racial differences must be considered during diagnosis and treatment planning. When Japanese-Brazilian adults with normal occlusions and well-balanced faces are compared to white norms, again differences are found. Scavone et al. (2006) evaluated 30 Japanese-Brazilian men and women, and compared them to white norms. Distances from a true vertical line, as well as nasolabial angle were evaluated. The Japanese-Brazilian women had more anteriorly positioned glabellae, less nasal projection, and a more obtuse nasolabial angle. The Japanese-Brazilian men also had a more anteriorly positioned glabellae, less nasal projection, more protrusive lips, less projection of soft tissue B point and more obtuse nasolabial angles. The authors summarized that a single norm for profile esthetics doesn't apply to all ethnic groups. Kalha, Latif and Govardhan (2008) proposed soft-tissue cephalometric norms for a South Indian population. They analyzed 30 men and 30 women having class I occlusions and reasonable faces. Each subject was analyzed using the soft tissue cephalometric analysis proposed by Arnett et al. (1999). They found that compared to white norms, South Indian's have more deep-set midfacial structures and more protrusive dentitions. They noted that the clinician must use local norms for a reference rather than established norms for white people.

Orthodontic diagnosis and treatment goals

In the early 1900s, Angle advocated that the main goal of orthodontics was to achieve class I occlusion with a full complement of teeth. He believed that if the teeth were in good occlusion then facial esthetics and harmony would follow. (Angle EH., 1907.) Tweed, a student of Angle, became dissatisfied with the facial esthetics of patients

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previously treated to Angle's philosophy of full complement of teeth. Tweed stated that " Angle's philosophy of treatment was neither scientific nor clinically sound and that c