

Ideal Facial Relationships and Goals

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Abstract

Analysis of the face is an essential component of facial plastic surgery. In training, we are taught standards and ideals based on neoclassical models of beauty from Greek and Roman art and architecture. In practice, we encounter a wide range of variation in patient desires and perceptions of beauty. Our goals seem to be ever shifting, yet our education has provided us with a foundation from which to draw ideals of beauty. Plastic surgeons must synthesize classical ideas of beauty with patient desires, cultural nuances, and ethnic considerations all the while maintaining a natural appearance and result. This article gives an overview of classical models of facial proportions and relationships, while also discussing unique ethnic and cultural considerations which may influence the goal for the individual patient.

Keywords

- ▶ face
- ▶ ethnicity
- ▶ proportion
- ▶ aesthetic
- ▶ plastic surgery

“Beauty is in the eye of the beholder” may ring true in certain circumstances, yet we have evidence that many attributes of beauty are intuitive and unlearned. There are principles of beauty which seem to apply universally. Evidence of this is found in infant studies in which the babies consistently showed a stronger preference for faces considered attractive by common standards than they did for less attractive faces. These innate preferences seem to transcend gender or race and have been observed in infants so young, that it could not be considered a learned response.^{1,2} There is, therefore, a cross-cultural standard of beauty, recognizable to humans at our earliest stages in development. Yet, defining this standard remains elusive. Universal attributes of beauty tend to include youthfulness and symmetry as well as sexual dimorphism and averageness.^{3,4}

In training, we learn that optimal attractiveness is accomplished by producing attractive facial proportions and symmetry. We also must take into consideration the age, race, gender, and, most importantly, desires of the particular patient. The ultimate goal of all cosmetic surgery is patient satisfaction. We can never feel truly successful, no matter how appealing the outcome of a procedure, if the patient is not pleased as well. As we discuss patient expectations and desires, we have both historical ideals of beauty as well as modern trends to guide us toward socially acceptable and appealing standards.

Our goals for any individual patient seeking to enhance their appearance are typically based on the four following ideas: (1) classical definitions of beauty as they relate to symmetry, proportion, and youth; (2) achieving a natural and unoperated look for the patient; (3) current cultural trends and ideals; and (4) patient’s personal preferences and desires. These four principles must be in harmony to establish an ideal facial relationship and goal for each individual patient. Classical definitions of beauty, especially as they describe proportion, are not necessarily applicable to every patient or every ethnicity. In certain patients, too drastic a change may also result in an overdone or “operated” look. It is important to counsel patients regarding these principles, advocating for a natural and culturally appropriate appearance. Our aim is to obtain classical beauty with well-proportioned features and symmetry, while satisfying the patient’s particular desires, and keeping a natural appearance consistent with the patient’s culture and ethnicity.

Facial Proportions

Facial analysis typically begins with examining the skeletal framework of the face for symmetry and proportion. This is traditionally done by dividing the face into horizontal thirds and vertical fifths. This initial basic assessment allows for rapid identification of underlying skeletal imbalances and

facial asymmetries. The horizontal thirds are measured from the hairline to the glabella, the glabella to the subnasale, and the subnasale to the menton. Each of these heights is exactly one-third of the facial height. The face is also divided into vertical fifths, in which each part is equal to the width of the eye (—Figs. 1 and 2). Classically, the nose fits perfectly within the middle fifth, and the lateral fifth extends from the lateral canthus to the lateral most visible point of the helix of the ear on frontal view.

This method is based on Greek neoclassical canons and is typically applicable to Caucasian populations. However, it has been found that there is consistent variation within people of different ethnic groups. For example, Sim et al published a study comparing the facial proportions of a population of southern Chinese women to reported measurements of the face in white women.⁵ Their findings showed that the middle third of the face was taller in the Chinese population, relative to the population of white women. The forehead was also generally smaller. The Chinese population also had a wider intercanthal distance as well as a wider nasal base, when examining the face divided into horizontal fifths. It is interesting that this preserves the harmony of the central face, and the wider intercanthal distance complements the wider nasal base. Fang et al found forehead height to be the most variable of facial proportions among various ethnic groups.⁶ Farkas et al found the orbital and nasal regions to be some of the most highly variable among various ethnicities.⁷ It has also been noted that cultural trends may influence the desirability of certain proportions. In a study of Italian models, for example, Torsello et al found that a middle third slightly shorter in height than the upper and lower facial thirds was found attractive, which may indicate a more modern trend.⁸ These studies and several more have given guidance in analyzing facial proportions for patients of various ethnicities, and, in undertaking

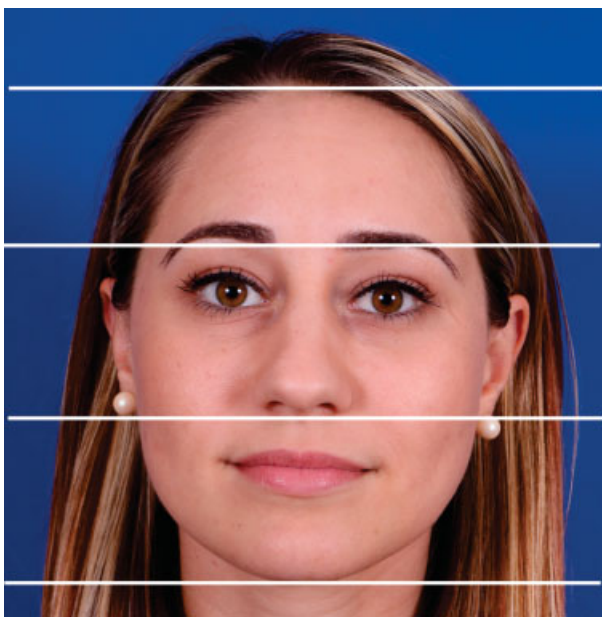


Fig. 1 Face divided into vertical thirds from the hairline to glabella, glabella to subnasale, and subnasale to menton.

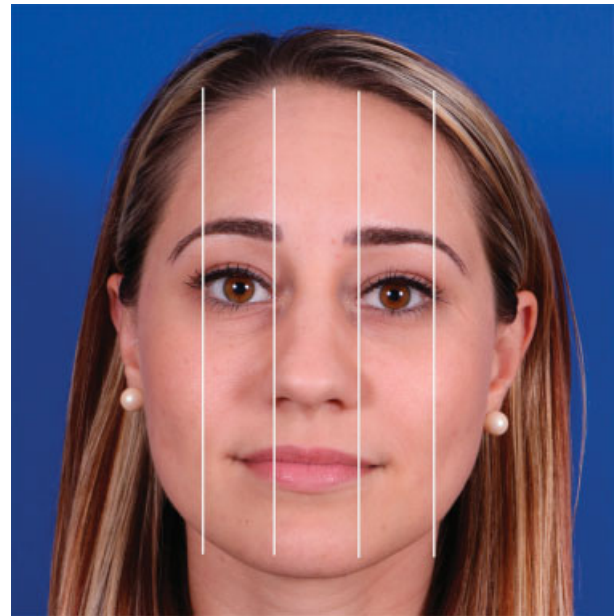


Fig. 2 Face divided into vertical fifths, each fifth is the width of the intercanthal distance.

such an analysis, care must be taken to consider what is normal for the patient's ethnic background.

The concept of the golden ratio dates back to ancient Greece. It was noted to be a naturally occurring proportion considered aesthetically pleasing to the eye and found to be pleasing when applied to facial features. The value of the ratio is 1.61803 but can be understood as a line divided into two segments, where the length of the whole line is to the longer segment as the longer line is to the shorter segment. This ratio is represented by the Greek letter phi (ϕ)⁹ (—Fig. 3). This figure has been applied to proportions of facial height, to the lips, the nose, ratio of the mouth to the eyes, and several other facial proportions. Marquardt designed a mask of the human face using the golden ratio as the guideline.¹⁰ This mask serves as an elegant three-dimensional application of the golden ratio to facial proportions. It is remarkable how the mask seems to fit attractive faces regardless of ethnicity.

Although this mask and the ratio remain useful tools, they are not universally applicable. Holland noted that Marquardt's mask tends to be too masculine for an ideal feminine face.⁹ Moreover, although the golden ratio is appealing to the eye, it does not seem to be necessary for attractiveness of many facial features to which it has been applied. An interesting study

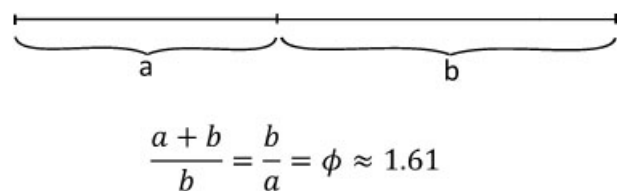


Fig. 3 The golden mean, phi, represented as a line divided into segments.

based on a Malaysian population found that conformity of the facial height to the golden ratio did not significantly affect the perception of attractiveness within this population.¹¹ Studies of different ethnic populations have found deviation from the golden ratio while still maintaining a high degree of attractiveness.^{12,13} It is therefore notable as a guide, but not always applicable as a goal, in facial plastic surgery.

Eyes

Eyes are considered among the most attractive facial features in women and men and are also among the first features to show signs of aging. For this reason, surgical rejuvenation of the periorbital tissues is among the most sought-after aesthetic procedures. Most aesthetic surgery involving the periorbital tissues involves restoration of a youthful appearance to the eye. Dermatochalasis of the upper and lower lids, pseudoherniation of orbital fat, and brow descent are some of the leading contributors to the aged eye appearance. Conversely, restoration of a smooth, full upper and lower lid, without the irregularity of bulging periorbital fat, conveys youth. A positive canthal tilt is considered attractive in both men and women, with the lateral canthus positioned slightly superior to the medial canthus by approximately 2 to 4 mm.¹⁴ The angle of this tilt is slightly increased in women, at 2° to 4°, compared with men at 1° to 2°, and is considered a hallmark of a beautiful eye¹⁵ (→Fig. 4).

The upper eyelid is full in youth, without sagging or bulging of tissues. In Caucasians, the upper lid has a well-defined supratarsal crease, typically 7 to 10 mm from the palpebral margin.¹⁵ The supratarsal crease is a feature which is often lacking in the eastern Asian eyelid. Blepharoplasty with a creation of a supratarsal crease is a largely sought-after procedure among eastern Asians, yet creating a crease consistent with their ethnicity and personal preferences

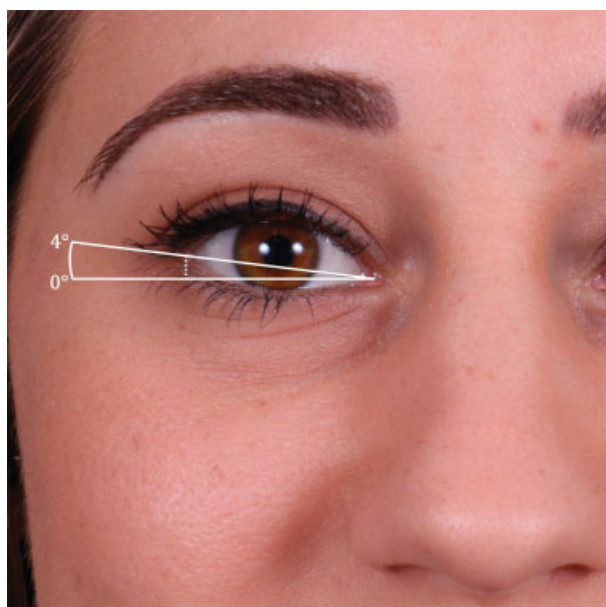


Fig. 4 A youthful eye demonstrating a noticeable positive canthal tilt of ~4° from horizontal. Elevation at the lateral canthus is ~2 mm above the medial canthus (dotted line).

should be the goal. A lower lying crease at approximately 7 mm appears more natural than a higher crease, and the skin excision should be conservative.¹⁶ Even in these cases, the patient's goals and desires must be carefully elicited prior to any procedure. It has been found that eastern Asian preferences tend to differ based on nationality. For example, Dobke et al found Korean women seeking blepharoplasty tend to prefer a larger crease and elimination of the epicanthal fold, whereas Japanese women seeking the same procedure overwhelmingly desired to keep the epicanthal fold and preferred a smaller crease.¹⁷ These preferences highlight the need for thoughtful and thorough conversation in the preoperative consultation.

The goals for lower lid surgery are typically more straightforward. There is less variation in the ideal lower lid. In youth, the lower lid is typically inconspicuous, and rarely in need of cosmetic attention. It is with age that the lower lid lengthens, and we begin to see pseudoherniation of fat, drawing unwanted attention to this facial feature. Additional changes secondary to aging can include ectropion, lagophthalmos, and dermatochalasis. The descent of the visible lid-cheek junction occurs primarily as a result of the descent of the midfacial soft tissues and the malar fat pad, causing a visibly longer lower lid. Fezza and Massry showed that there is a near doubling of the length of the lower lid between one's twenties and nineties. They found the average lower lid length of a woman in her twenties to be 10.425 mm and of a woman in her nineties to be 18.625 mm with noticeable lengthening in every decade of life.¹⁸ Thus, camouflaging the lid-cheek junction and creating the appearance of a shorter lid gives the appearance of a youthful lid.

Brows

Ideal brow position has fluctuated even within the last several decades and is one facial feature which displays a high degree of variation in individual preferences. Westmore described the ideal brow shape as having a medial extent in line vertically with the lateral nasal ala and medial canthus, ending laterally at a line drawn from the lateral ala through the lateral canthus, having medial and lateral ends at the same vertical height, and having an apex immediately above the lateral limbus.¹⁹ This brow shape has been considered a standard and is referenced almost everywhere brow position is discussed. However, modifications have been made to this shape by others. It is not necessarily considered the ideal brow for every facial shape. Griffin and Kim found that the female brow peak, which is considered youthful and culturally ideal, has evolved since this shape was first described in the mid-1970s. Rather than being located over the lateral limbus, a more lateral peak vertically aligned with the lateral canthus, is now preferred. Not only this, but the peak has become lower, and the overall brow shape for women has become flatter and less arched since the Westmore brow was first described (→Fig. 5).²⁰ Even though these changes have been noted, there still does not seem to be a consistent brow position considered ideal for every face. Hamamoto et al found no single brow position to be strongly preferred over another when comparing digitally altered photographs of

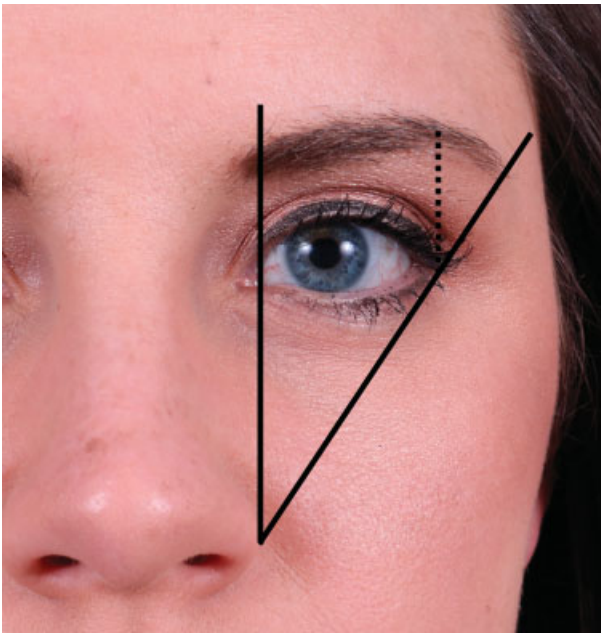


Fig. 5 A modern brow shape with the arch located over the lateral canthus.

brows, where each was altered to reflect a prominent design method of the brow. In this study, various brow positions were preferred for different faces.²¹ This has been shown in other studies as well, which showed that brow position and shape may affect the overall appearance of the facial shape. Different facial shapes may appear more attractive with one brow shape over another.²²

Regardless of the ideal position, one consistent hallmark of aging is descent of the tail of the brow. Glass et al recently described the position of the tail of the brow in a population of varied age, gender, and ethnicity. This showed that descent of the lateral brow is consistent among patients of different gender and ethnicity, with the vertical height of the lateral most extent of the brow falling approximately 2.5 mm per 20 years.²³ This consistency among patients of various ethnicities reinforces the need for preferential lateral elevation in brow rejuvenation.

Nose

The central position and prominence of the nose cause it to be the most critical aesthetic facial structure. A nose which is in harmony with the rest of the facial shape allows other facial features to be appreciated, while a nose which is disproportionate can significantly detract from all other facial features, no matter how lovely they may be. The position of the nose causes it to be subject to a higher degree of scrutiny. Small asymmetries may go unnoticed on other parts of the face, but nasal asymmetries tend to draw attention due to their central location. All considerations of nasal aesthetics are secondary to the function of the nose. Cosmetic surgery of the nose, perhaps more than any other aspect of facial plastic surgery, has resulted in devastating outcomes when surgery is undertaken for aesthetic reasons without proper consideration to the

necessity of the nasal form for the function of the nasal airway. Revision rhinoplasty has become a common procedure and is often done exclusively for functional concerns. Having a proper understanding and respect for the functional aspect of the nasal anatomical structure can help us avoid many of these poorly functioning outcomes.

It has been traditionally taught that the alar base width ought to equal the intercanthal distance, which in turn should be equal to one-fifth of the overall facial width. This standard may be too narrow for many faces. It has been noted that multiple non-Caucasian ethnicities typically have a wider alar base than this recommendation.^{24,25} Narrowing of the alar base and reduction of alar flare is often requested by patients of various ethnic groups, but caution must be used as over-narrowing could appear incongruous with the overall facial appearance for these patients. Even in Caucasians, a base slightly wider than the intercanthal distance is common and may be considered attractive as long as it remains in proportion with the rest of the face.²⁶

On profile view, most people generally prefer a straight profile. However, this is an aspect that must be thoroughly explored with the patient regarding their preferences and desires. Several decades ago, a slightly concave dorsum was felt to be attractive, but overresection of the dorsum resulting in concavity has become a hallmark of an operated nose. Nearly all patients wish to avoid an unnatural look. A more global appreciation for beauty among various ethnicities has led to appreciation of various shapes, including sometimes a dorsal convexity. Reduction of a dorsal hump is one of the most frequent reasons rhinoplasty is sought, but the expectations for dorsal height must be clearly communicated to arrive at a goal that is satisfying to both the patient and surgeon. Digital imaging and morphing software work wonderfully to convey changes in the dorsal nasal profile. Although these tools must be used with caution, they greatly facilitate conversations between a patient and surgeon, enabling each to communicate their concept of an ideal profile with greater clarity.

There are several methods for determining ideal tip projection. Baum's method was the first described for calculating ideal tip projection. This was calculated by placing a vertical line through the nasofrontal angle to the subnasale and then placing a perpendicular line from this point through the nasal tip. This yielded a 2:1 ratio of the vertical to the horizontal line. This was felt to yield excessive projection of the tip, so Powell and Humphreys modified the number to suggest a ratio of 2.8:1, which gives a smaller nasofacial angle of 36°.²⁷ Perhaps, the most widely used currently is Goode's method, which uses a 3 to 4 or 5 triangle. The first leg of the triangle is from the nasofrontal angle through the alar crease, then a line is drawn perpendicular to this one through the tip-defining point, and, finally, the triangle is completed by a line from the tip-defining point to the nasofrontal angle, along the nasal dorsum. The ratio of the projection of the nose from the alar crease to the tip should equal 0.55 to 0.60 of the nasal dorsal length from the nasion to the nasal tip (→Fig. 6).²⁷ Other methods, such as those developed by Crumley and Lanser related the nasal projection to other facial features as well. Their first method consisted of a line

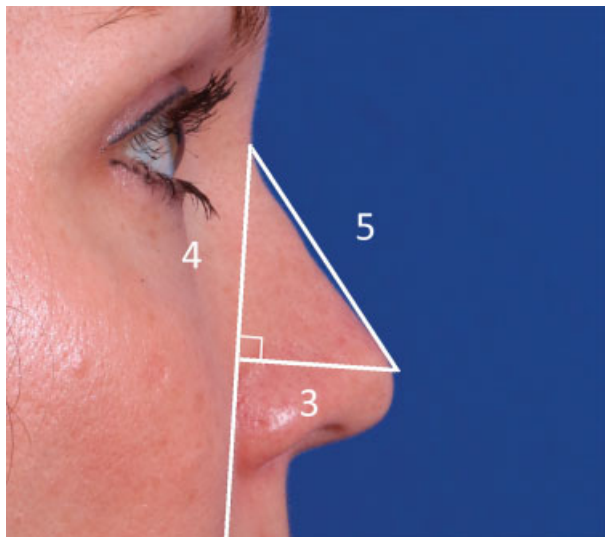


Fig. 6 Nasal projection based on Goode's technique. Projection is equal to 0.6 of the nasal length, creating a 3 to 4 or 5 triangle.

from the nasofrontal angle to the vermillion cutaneous junction of the upper lip, with a perpendicular line drawn from this to the nasal tip. The ideal ratio using this method should be 3.53. Their second method is based on a triangle, similar to Goode's, except that the line passing through the alar crease is extended to the level of the mandible. The ratio, then, of this longest line to the perpendicular line through the nasal tip should be 4.23.²⁸ These projection values have been compared in previous studies, and the Goode and Crumley and Lanser ratios have been found to be positively correlated with facial attractiveness.²⁹

Tip rotation is as important as projection in obtaining an attractive profile. A range of rotation with a nasolabial angle from 95° to 115° has been considered an acceptable range for women, while a less obtuse angle is generally preferred in men, closer to 90° to 95°. In one study, a nasolabial angle of 104.9 ± 4.0° was noted to be preferred in females, and in males an angle of 97.0 ± 6.3° was found to be the most attractive by the study population.³⁰ This is interesting as the angle for men is slightly more obtuse than previously recommended and could possibly reflect changing cultural preferences. Yet, another article found both ideal angles to be closer to 95° to 100°. ³¹ Still another study found the columellar facial angle of 106° to be the most attractive in young women (→ **Fig. 7**).³² The differences between these reported ideal ranges is likely due to variations among expert rhinoplasty surgeons as to the definition of the nasolabial angle. Some studies have also used a columellar facial angle, which measures rotation relative to the vertical plane of the face rather than to the upper lip.³³ The nasolabial angle is frequently defined as the angle formed by a line tangent to the anterior most point of the columella to the subnasale and a line passing from the subnasale to the mucocutaneous border of the upper lip.²⁷ Others have used the midpoint of the nostril, or the long axis of the nostril, and the subnasale as one line and compared it to a line perpendicular to the Frankfort horizontal, or the vertical plane of the face, or the

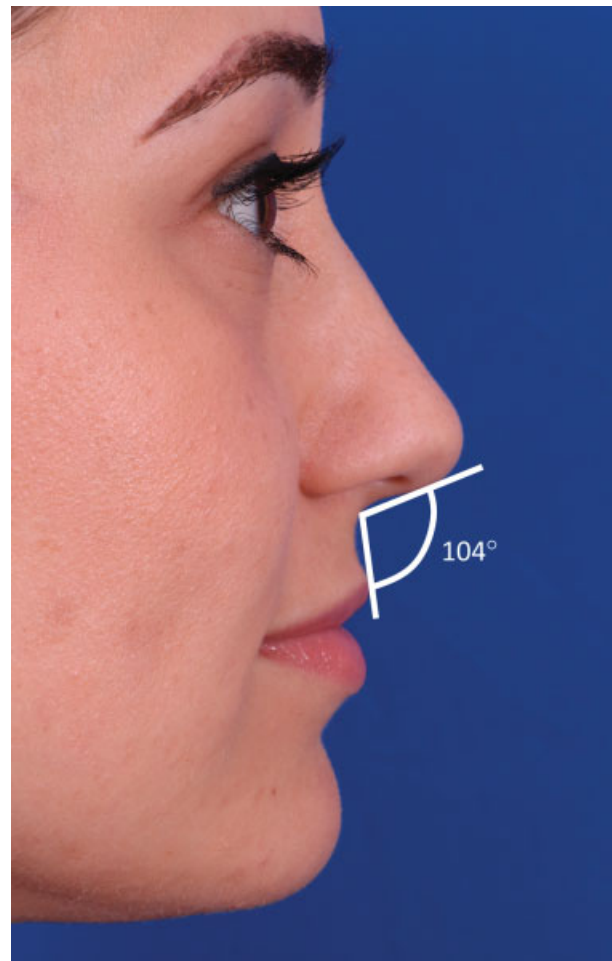


Fig. 7 Nasolabial angle, measured using the columella to the subnasale and the subnasale to the mucocutaneous border of the lip.

cutaneous lip proper.³¹⁻³³ The definition used for this angle must always be clear. These variations in interpretation can have a profound impact on profile appearance if the concept is inappropriately applied. The tip rotation should be taken into account with protrusion of the upper lip in mind. A more projected upper lip may result in a nasolabial angle which appears too acute. This difference may be especially noted in patients of various ethnicities, such as African Americans, who tend to have increased protrusion of the lip and may therefore tolerate a greater degree of nasal rotation.

Lips

Fullness of the lips is generally considered an attractive feature for women. Proportionate lip measurements for both women and men contribute to the overall harmony of the face. With age, the lips tend to become less prominent and develop fine lines. Loss of muscle tone and subcutaneous fat lead to thinning and decreased prominence of the lips with age. Balance of the upper and lower lip is necessary for a natural appearance. The golden ratio of approximately 1:1.6 has been considered an ideal ratio for upper to lower lips in terms of attractiveness. Studies support that lip proportions very close to this ratio are considered attractive, especially in Caucasian women.³⁴

Vertical height of the lips as well as the protrusion on profile view must be considered. The ideal protrusion of the lips has been reported as the upper lip having a slightly greater protrusion than the lower lip. The upper and lower lips should protrude slightly beyond a line drawn from the subnasale to the pogonion. The upper lip protrudes an average of 3.5 mm beyond this line and the lower lip an average of 2.2 mm (► **Fig. 8**).²⁷ Studies reveal that typically eastern Asians prefer smaller lips relative to Caucasians, while Hispanics prefer larger lips.³⁵ African Americans naturally tend to have fuller lips on profile, and studies show that they do prefer a fuller, more protrusive lip as well.³⁶ It has been previously suggested that the width of the lips should reach the medial limbi. However, in the Chinese face, this was not found to be the case in a large percentage of women who had natural and appropriate looking lips. Sim et al revised this suggestion, recommending that the lips should be approximately 40% the width of the lower face, which is a standard that applies more broadly to various ethnicities (► **Fig. 9**).⁵

Cheek and Midface

The effects of gravity are especially noticeable in the cheek and midface. This results in visible changes to this area, as well as to the lower eyelid, chin, and perioral region. Restoration of a youthful midface is a cornerstone of rejuvenating, not only the cheek, but all these facial regions. The youthful midface has a rounded cheek with smooth transitions to the lower lid, nose, nasolabial, and lateral facial regions without abrupt demarcation of these as distinct regions (► **Fig. 10**).³⁷ Thus, the goal of midfacial rejuvenation should be to restore the smoothness and fullness of this contour, while masking

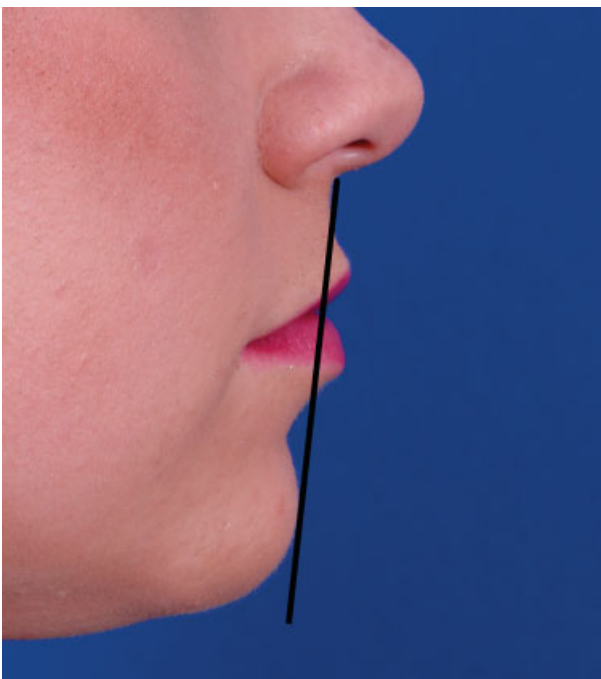


Fig. 8 Protrusion of the lips on profile view. Both lips should protrude beyond a line from the subnasale to pogonion. The upper lip is slightly more protrusive than the lower lip.

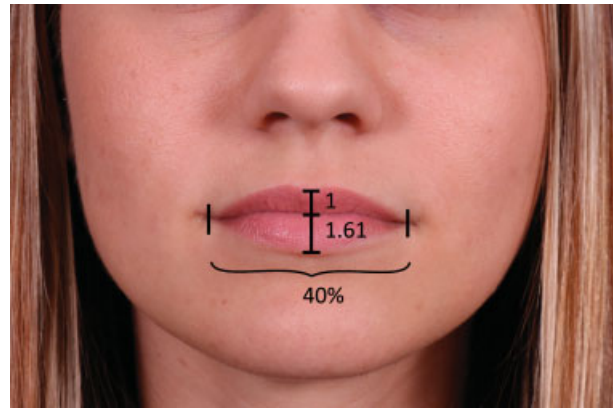


Fig. 9 Well-proportioned lips, with a vertical height ratio of 1:1.6 and width ~40% of that of the lower face.

the abrupt transitions of the nasojugal fold, midcheek furrow, and palpebromalar groove.³⁸ These aging changes do not seem to have much variance among different ethnicities. Care must be taken not to overfeminize a masculine face in the correction of cheek deformity and midfacial volume loss.

Chin

Various studies have shown that an average, straight profile, with neither significant protrusion nor retrusion of the chin



Fig. 10 Youthful midface demonstrating smooth rounded cheek and graceful curvature.

is usually found to be most attractive. Naini et al found that protrusion or retrusion of the chin up to 4 mm has no real effect on perceived attractiveness, but deviance beyond this impairs the aesthetic of the profile. This study showed that both laypeople and clinicians felt surgery for correction of chin projection should be considered at a protrusion greater than 6 mm or a retrusion greater than or equal to 10 mm.³⁹ Thus, it seems that retrusion is better tolerated than protrusion, but both are acceptable within approximately 4 mm of a straight profile. In a multiracial study of Malaysian Chinese, Malay, and Indian ethnic groups, these preferences were confirmed, once again, with a mild degree of retrusion being tolerated better than excessive chin protrusion.¹¹

Conclusion

The neoclassical standards are no longer considered targets toward which one should aim, but rather they are guides in facial analysis, which allows us to come up with an ideal goal for each patient as an individual, based on their age, ethnicity, and personal preferences. No single human face exemplifies universal beauty as there are ethnic and cultural differences that allow for beautiful variations, which all have in common symmetry and proportion. Our understanding of the underlying principles which contribute to facial beauty allows us to better serve our patients in accomplishing their aesthetic goals. We have a responsibility to continuously develop our own understanding of these principles, taking into account classical, contemporary, and cultural ideals.

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