

Ideal Female Brow Aesthetics

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KEYWORDS

• Brow lift • Forehead lift • Aesthetic surgery • Browplasty • Photography • Beauty • Fashion

KEY POINTS

- The ideal modern female brow aesthetic is becoming lower, flatter, and with a more lateral peak.
- There is likely an interaction between a woman's age and the perceived ideal brow position.
- Volumizing the brow upper lid complex will likely supplant many of the traditional open brow lifting techniques.

The computer can't tell you the emotional story. It can give you the exact mathematical design, but what's missing is the eyebrows.

—Frank Zappa

<http://www.brainyquote.com/quotes/keywords/eyebrows.html>

INTRODUCTION

Few facial features are as powerful as the eyebrows. Sclafani¹ recently called them “the superior aesthetic frame of the eyes.” This statement is significant because vision-tracking studies have shown that when viewing a face, people spend the most time looking at the periorcular region.² The eyebrow can express wide-ranging and subtle emotions, even when the rest of the face is neutral. Elevated brows suggest surprise and, when lowered, they express fatigue and aging. Medially angled brows indicate anger, whereas laterally angled brows connote sadness.³

Given their importance in facial aesthetics and emotional expression, it is not surprising that women have sought ways to change the appearance of their eyebrows to better project youth, beauty, and energy. Plucking and dyeing can achieve modest

changes, but more permanent and impressive alterations require surgical intervention. Browplasty was initially described nearly a century ago and became significantly more popular recently because of more effective and less invasive techniques. There are several potential indications for aesthetic forehead surgery, including the reduction of forehead rhytids and the repositioning of skin and soft tissue in the upper lid–brow complex⁴; however, it is difficult to perform significant forehead surgery without changing the location of the eyebrows. Most women undergoing aesthetic forehead surgery simply want to look younger and more alert. It will be difficult for them to more specifically articulate a goalresting brow position. Hence, it is important for the surgeon to possess an understanding of the ideal youthful female eyebrow.

THE IDEAL FEMALE BROW

Beauty is an evolving concept specific to a particular time and population. Contemporary ideas about the ideal female brow (in North America) originated with makeup artists like Westmore in the 1970s.⁵ His formulation placed the medial and lateral brow at the orbital rim, with the peak located above the lateral limbus (LL) approximately 1 cm

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above the bony rim. Over the past 40 years, investigators have proposed several changes to Westmore's model.

Ellenbogen³ stated that the inferior aspect of the medial eyebrow margin should start 1 cm above the supraorbital rim. Whitaker and colleagues⁶ thought the brow peak should be at the junction of the middle and lateral thirds. This idea was supported by Byrd, who added that this point corresponded to the intersection of the brow with a line connecting the nasal ala and LL. Byrd also recommended that the peak should be 8 to 10 mm superior to the medial brow.⁷ As far back as 1989, Cook and colleagues⁸ stated that the peak of the eyebrow should be above the lateral *canthus* (LC) not the LL because a more medial peak yielded a surprised look. Several investigators have proposed even more strict numerical guidelines for the brow position. Connell and colleagues⁹ recommended 1.5 cm between the eyebrow and the upper-lid skin crease. McKinney and colleagues¹⁰ evaluated 50 young women and found an average of 2.5 cm from the midpupil to the superior brow. They concluded that a brow *less* than 2.5 cm from the midpupil was ptotic and sought to raise the brow to 2.5 to 2.8 cm above the pupil with a forehead lift. Matarasso and Terino⁴ essentially reiterated the values proposed by Ellenbogen, Connell, and McKinney. These values were all based on extensive personal experience but remained largely subjective.

OBJECTIVE ANALYSIS

Objectively defining an ideal female eyebrow position is challenging, even beyond the fact that aesthetic trends are constantly changing. Who determines what is ideal when there is no gold standard? In such instances, it is helpful to analyze a problem from many different perspectives.

Observer Scored

Several investigators have used a group of observers to evaluate the brow position of women in photographs. Schreiber and colleagues¹¹ asked 100 individuals to rank 21 female and 6 male photographs for attractiveness on a 10-point scale (10 = most attractive). The photographs that were given a score greater than 7 were then analyzed for various eyebrow dimensions. Their measurements were all in relation to eye width to allow comparison between photographs. They measured medial canthus to medial brow, LC to lateral brow, and the location of the eyebrow peak in relation to the eye width. Observers preferred the brow peak at 71% of the distance across the eye width, which is roughly at the LL. A strength of this study

was its large number of raters. One weakness is that only a few photographs (fewer than 10) were analyzed for the ideal female eyebrow characteristics.¹¹

Freund and Nolan¹² used Adobe Photoshop (Adobe Systems, Inc, San Jose, California) to alter the eyebrow characteristics in photographs of young Hispanic, Anglo-Saxon, and Slavic women. Two sets of images were generated. In the first set of images, the eyebrow shape was kept constant, but the medial brow was placed at, below, or above the supraorbital rim. In the second set, the eyebrow peak was placed medial or lateral to the LL, or the eyebrow was made completely flat without a clear peak. The altered photographs were then scored for attractiveness by 11 plastic surgeons and 9 established cosmetologists. Surgeons and aestheticians preferred a medial brow at or below the supraorbital rim; medial brows above the rim were considered unattractive. In the second set of images, both groups of raters preferred laterally peaked brows, then flat brows, then eyebrows with a medial apex.¹²

Baker and colleagues¹³ used Adobe Photoshop to create 4 facial shapes (round, square, oval, and long) for 5 different models. They erased the eyebrows and asked a modern makeup artist to draw new appropriate eyebrows on each face. In a second set of images, they used eyebrows using Westmore's original criteria. They then asked 78 individuals to compare the makeup artist's and Westmore's eyebrow position for each of the 20 face/shape combinations. In the oval and round faces, the two eyebrow locations were each preferred by essentially 50% of the participants. However, 58% and 62% of participants preferred the makeup artist's brow in the long and square faces, respectively. The makeup artist altered the height, severity, and location of the peak to better complement the long and square faces.

Billier and Kim¹⁴ photographed 4 women (a 30-year-old Caucasian, a 30-year-old Asian, a 60-year-old Caucasian, and a 60-year-old Asian) and used the Mirror Suite (Canfield Scientific, Fairfield, New Jersey) to alter brow position, nasal tip width, and nasolabial angle. Five unique eyebrow shapes were created for each model, with the eyebrow apex at a different location: midpupillary line, LL, halfway between limbus and canthus (HF), LC, and the lateral brow margin (LM). The images were rated by 171 observers. Each brow position, except LM, was ranked very similarly, with a nonstatistically significant trend toward preferring more lateral brow positions in the two younger models (highest ranking for HF) compared with the two older models (highest ranking for LL).¹⁴

Self-Evaluated

Only one study has asked people to try to create their own sense of a perfect eyebrow position. Sclafani and Jung¹ asked 23 women and 7 men to place their eyebrows in the optimal position and then took measurements. Patients had a ruler taped to their nose so actual measurements could be performed on the photographs. They found that women preferred their brow peak 13 mm (SD: ± 4 mm) above the medial brow height. There was no measurement taken of the brow peak in relation to the eye width, the LL, or the LC, which makes it difficult to compare this study with others.¹ It is difficult to know how accurate self-positioning the brow is, particularly when there is a ruler taped to the nose, which alters the sense of facial proportion.

The Ideal Female Brow as Portrayed in the Media

The studies discussed earlier used patients or observers to determine the characteristics of an attractive female eyebrow. A completely different approach is to analyze the eyebrow dimensions of models and actresses—women who are widely thought to be attractive.

Gunter and Antrobus¹⁵ compared eyebrow characteristics between a group of models photographed in popular fashion magazines and a group of women seeking aesthetic facial surgery in Dallas, Texas. They did not report how many photographs were examined, and there was no report of an objective or statistical analysis. They concluded that fashion models' eyebrows tend to be low medially and ascended in a relatively straight line to a peak near the LC. In contrast, eyebrows of women in the patient group were often more curved and peaked closer to the LL.¹⁵ The article does include an excellent discussion of how to tailor aesthetic forehead surgery to multiple eye types (deep set, and so forth).

Roth and Metzinger¹⁶ performed the best analysis of eyebrow dimensions in fashion models to date. They analyzed the left eyebrow in full-frontal photographs of 100 women portrayed in magazines published in 2001. This group was compared with full-frontal photographs of 105 women aged 21 to 61 years. They calculated 5 measures for each photograph: the height of the lateral brow in relation to the medial brow; the relation of the medial brow to a vertical line through the nasal ala and medial canthus; the relation of the lateral brow to a line connecting the nasal ala and LC; how far across the eye width (medial to LC) the LL falls; and where the eyebrow peak was located in relation to the eye width. In both groups, the LL fell 75% ($\pm 2\%$) of the way across

the eye width at neutral gaze. In fashion models, the lateral brow ended superior to the height of the medial brow; however, the medial and lateral brow were most commonly at the same level in the group of random women. The medial brow fell medial to the alar-medial canthal line in more than half of the models but was most commonly even with this line in the group of random women. The lateral brow in models typically ended right at the alar-lateral canthal line versus lateral to this line in the other group. The brow peak fell slightly more lateral in the group of models (98% vs 93% of the distance across the eye). In both groups, the brow peak was much closer to the LC than the LL.¹⁶

THE EVOLUTION OF THE PERFECT EYEBROW

Some investigators have suggested that the peak of the ideal female eyebrow has been moving more laterally. Roth and Metzinger's findings, as discussed earlier, certainly support a modern ideal brow peak very close to the LC, as opposed to Westmore's classic location at the LL. One of Roth and Metzinger's interesting findings was that in the random women older than 50 years, the eyebrow peak fell at only 87% of the distance across the palpebral fissure or more medial as compared with the distance in the 20- to 29-year-old age group (95%). This finding resonates with the findings of Biller and Kim in which observers preferred a brow peak at the LL in older women but at the LC in younger women.¹⁴

A person's preferences for music, movies, and clothing are primarily determined during young adulthood. The authors wondered if the interaction between age and ideal brow characteristics could be caused by changes in the media portrayal of the perfect female eyebrow over time. For example, if models in the 1960s portrayed a different eyebrow than they do now, it could account for some of the differences in the concept of the optimal eyebrow

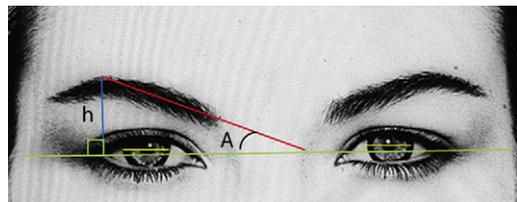


Fig. 1. Method of photographic analysis. A horizontal line (green) was drawn connecting the LC. The height (h) of the superior brow above the LC (blue) in millimeters was calculated by averaging the width of the irises (yellow) and setting this value equal to 11.8 mm. The takeoff angle (A) was calculated by drawing a line from the brow peak through the center of the medial brow segment (red).

Table 1
Location of the brow peak in relation to the LC and LC

Time	Photos	Eyebrows	Right Eyebrow				Left Eyebrow			
			LC	CLC	CLL	LL	LC	CLC	CLL	LL
1946–1955	25	50	36% (9)	28% (7)	12% (3)	24% (6)	48% (12)	16% (4)	16% (4)	20% (5)
1956–1965	27	52	50% (13)	31% (8)	4% (1)	18% (4)	31% (8)	35% (9)	27% (7)	7% (2)
1966–1970	25	50	24% (6)	24% (6)	24% (6)	28% (7)	20% (5)	32% (8)	16% (4)	32% (8)
1971–1980	22	43	27% (6)	23% (5)	27% (6)	23% (5)	38% (8)	24% (5)	33% (7)	5% (1)
1981–1990	27	54	37% (10)	22% (6)	19% (5)	22% (6)	52% (14)	26% (7)	11% (3)	11% (3)
1991–2000	24	47	22% (5)	43% (10)	22% (5)	13% (3)	46% (11)	38% (9)	8% (2)	8% (2)
2001–2011	24	45	41% (9)	41% (9)	9% (2)	9% (2)	10 (43%)	26% (6)	9% (2)	22% (5)

Abbreviations: LC, lateral canthus; CLC, brow peak closer to the LC than LL; CLL, brow peak closer to the limbus than canthus; LL, lateral limbus.

between young and old age groups today. The authors analyzed photographs from fashion magazines over the past 65 years. To their knowledge, there has never been an objective historical analysis of optimal female eyebrow characteristics as presented in the media.

METHODS

Microfilm versions of fashion magazines printed between 1946 and 2011 were examined for full-frontal photographs of models or actresses taken in the Frankfort plane. This position is important because even a relatively minimal head turn or tilt will change the apparent eyebrow characteristics. Images were excluded if eyes were closed, squinting, or there was any visible forehead rhytids (representing forehead muscle firing). Appropriate photographs were digitally captured from the microfilm, enlarged as needed in Microsoft PowerPoint (Microsoft, Redmond, Washington), and printed. They were broken into 7 blocks of time for analysis: 1946–1955, 1956–1965, 1966–1970

(the hippie era), 1971–1980, 1981–1990, 1991–2000, and 2001–2011. A line was drawn between the LC to set a true horizontal (**Fig. 1**). This line usually crossed the inferior pupil. A digital caliper was then used to draw a line 90° perpendicular to this (a true vertical) up to the eyebrow peak. The position of the brow peak in relation to the palpebral fissure was recorded as falling at one of 4 locations: at or lateral to the LC; closer to the LC than the LL; closer to the LL than the canthus; and at the LL or medial to this point. A line was then drawn from the superior brow at the brow peak along the vector of the medial brow segment. The brow takeoff angle between the true horizontal and this vector was measured using the digital caliper. Finally, the height of the brow above the LC was calculated in millimeters. First, the width of both irises was measured in millimeters using a metric ruler, averaged, and set equal to the actual width of the human iris (11.8 mm).¹⁷ This method yielded a multiplier that could be used to transform the height of the brow in the photograph into an actual measurement in millimeters.

Table 2
Brow height at the LC and takeoff angle of the medial brow segment

Time	Right Eyebrow		Left Eyebrow	
	Angle in Degrees (SD)	Height at LC (mm) (SD)	Angle in Degrees (SD)	Height at LC (mm) (SD)
1946–1955	21.3 (5.1)	21.9 (4.1)	19.4 (4.0)	22.2 (4.0)
1956–1965	21.0 (4.7)	23.9 (3.2)	19.1 (3.5)	24.1 (3.3)
1966–1970	19.1 (4.1)	21.4 (3.2)	19.0 (3.6)	21.6 (2.9)
1971–1980	20.6 (3.7)	21.9 (2.1)	19.5 (4.2)	22.2 (2.8)
1981–1990	19.9 (5.0)	21.1 (2.7)	17.8 (4.4)	21.1 (2.9)
1991–2000	18.8 (3.4)	19.6 (2.4)	17.2 (3.1)	20.1 (2.6)
2001–2011	19.7 (3.1)	21.2 (3.0)	17.1 (2.8)	21.0 (2.9)

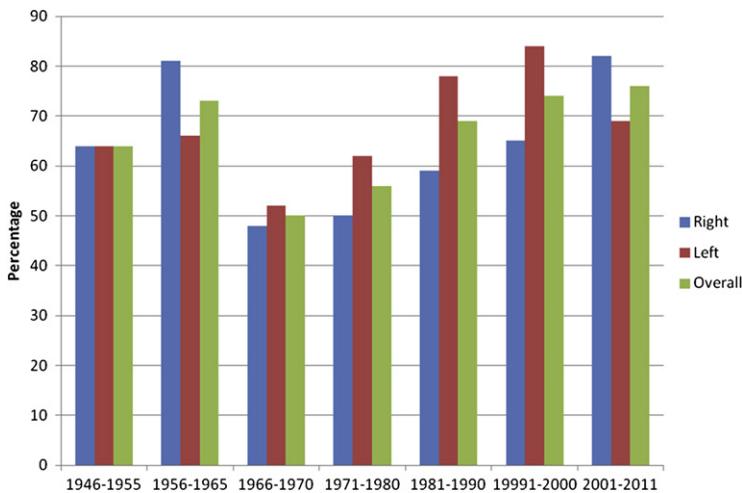


Fig. 2. The percentage of eyes when the brow peak fell closer to the LC than the LL versus time.

RESULTS

Tables 1 and **2** summarize the data for the brow peak location and the takeoff angle and brow height, respectively. Between 22 and 27 photographs were analyzed for each time period. This number is fewer than the goal, but very few fashion photographs are both full frontal and in a perfect Frankfort plane. Thus, quantity was sacrificed for quality. Occasionally, only one of the eyebrows was visible in an otherwise acceptable picture, which is why the total number of eyebrows analyzed is not always equal to exactly twice the number of photographs (see **Table 1**).

Fig. 2 shows the percentage of left, right, and overall eyebrows that are closer to the LC than the LL (CLC) ($LC+CLC/total$) versus time. Interestingly, there was a sudden medial shift in the location of the brow peak during the 1966-1970 period, with gradual lateral migration of the brow peak ever since. A review of these photographs shows that during the 1966-1970 timespan, eyebrows were closest to Westmore's ideal, with a very arched, rainbowlike configuration (**Fig. 3A**) as opposed to more recent periods (see **Fig. 3B**).

Eyebrow height at the LC and the takeoff angle has slowly decreased over time. Means are displayed in **Table 2** and expanded as box-and-whisker plots in **Figs. 4** and **5**. The average takeoff angle is lower for the left brow compared with the right for every time period. This finding likely has to do with a slight bias related to the fact that most people (including makeup artists and the author that performed the analysis of the photographs) are right-handed.

DISCUSSION

Aesthetic forehead surgery can help create facial balance after mid- and lower-face rejuvenation

and can augment or obviate upper blepharoplasty depending on a patient's anatomy. In some cases, significant brow ptosis creates a pseudoexcess of upper-lid tissue that is completely eliminated once the brows are returned to a more appropriate location. All aesthetic forehead surgery has the potential to alter the location of eyebrows, even when this is not intended. Thus, the aesthetic forehead surgeon needs to have a concept of the ideal female eyebrow position.

Eyebrow Position and Dimension

The authors analyzed the eyebrow position of models and actresses as portrayed in the Western print media over the past 65 years to identify eyebrow dimensions that are considered beautiful

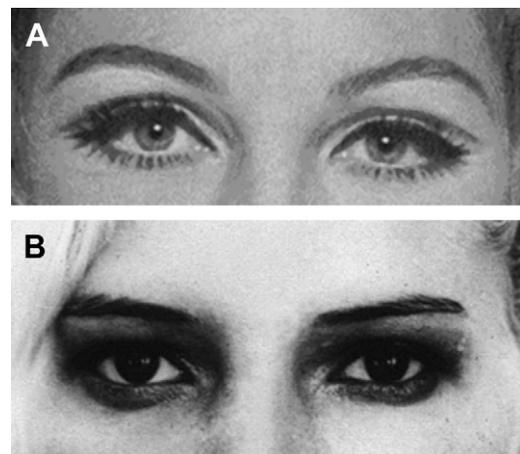


Fig. 3. Comparison of female brows as depicted in fashion magazines over time. (A) Example of brows from 1966 to 1970. (B) Example of brows from 2001 to 2010.

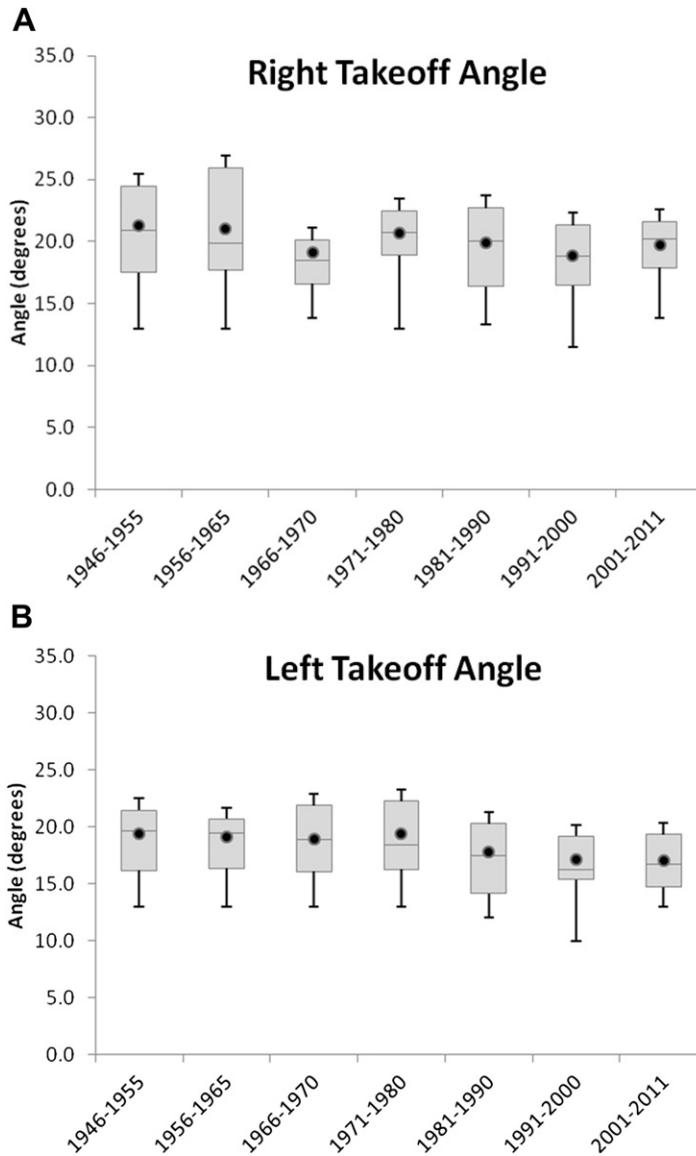


Fig. 4. Box-and-whisker plot of takeoff angle of the medial brow segment versus time. (A) Right brow. (B) Left brow.

and to see if these concepts have changed over time. It does seem that the location of the brow peak has been continuously and gradually migrating from the LL toward the LC since 1970. The brow peak was most medial during the 1966-1970 period, which was prospectively analyzed separately (vs the other groups which were 10-year blocks) because this corresponded to the hippie movement that challenged traditional gender roles and sexual mores. Westmore first presented his concept of the female eyebrow in the mid-1970s, and so his ideas may have simply been a summary of fashion trends at that time.

Height of Brow Peak

The authors also decided to analyze the height of the brow peak above a line connecting the LC as well as the takeoff angle that the medial brow makes with a true horizontal. These mean values have been more constant over time, although there has been a very gradual decreasing trend for both values (see **Figs. 4** and **5**). The mean height of the brow peak has been between 20 and 21 mm above the LC (central 50% range 15.4–21.6 mm), whereas the takeoff angle has averaged 17° to 20° (central 50% range 17.7°–22.4°), over the past 20 years.

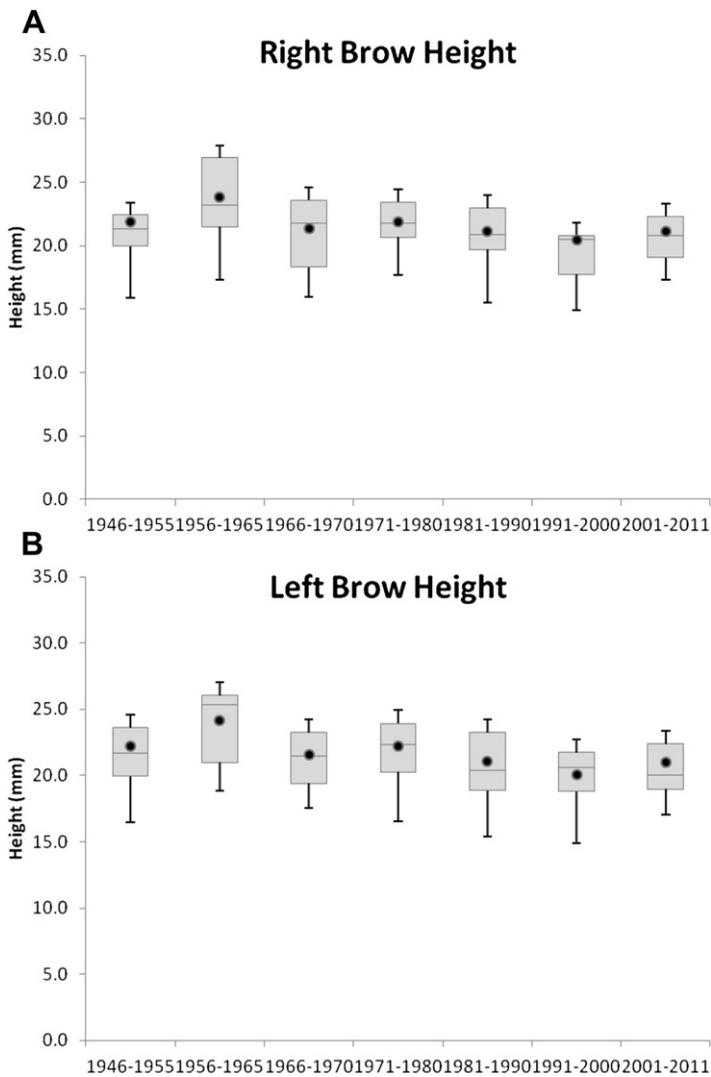


Fig. 5. Box-and-whisker plot of the brow height at the LC over time. (A) Right brow. (B) Left brow.

These values provide the aesthetic forehead surgeon with some guidelines that are relatively easy to measure intraoperatively, if desired. This data suggest that the ideal youthful female eyebrow has been getting lower, flatter, and less arched over time, with a more lateral peak and a lower takeoff angle of the medial brow segment (see **Fig. 3B**).

Some studies have found that the youthful female medial brow should be at or below the bony supraorbital rim.¹² The authors did not analyze the medial brow edge in this study because the supraorbital rim could not be reliably identified in most photographs. One of the more interesting and important findings over the past 10 years is that the medial extent of the female eyebrow frequently *rises* with age, instead of descending like most other facial features.^{18,19} For many years,

investigators have cautioned against placing the female eyebrow peak too medial, which can create a surprised look.⁸ The recent findings regarding female medial brow ascent with age call into question the concept of the brow-lift procedure. It would seem that, in many cases, the medial brow might actually need to be *lowered* to create a more youthful appearance. These findings also suggest that the location of the paramedian fixation points in an endoscopic brow lift should be moved more laterally. Traditionally, they were placed through an incision above the supratrochlear nerve bundle or pupil. This essentially guarantees that when the forehead soft tissues are elevated and fixated, the medial brow will be raised and the point of highest elevation will be medial to the LL. These effects are both undesired. A paramedian incision and fixation point superior to the LC should place the brow

peak at the desired lateral canthal location and should also limit the elevation of the medial brow. This more lateral location may make it more difficult to dissect in the midline, which can be solved with a midline vertical scalp incision for instrument access.^{20,21} In younger patients with predominantly lateral brow ptosis, deep temporal fixation only, without any paramedian fixation, may be adequate.²²

Interaction Among Facial Shape, Eye Position, and Ideal Brow

As Baker and colleagues¹³ and others have identified, there is an interaction between facial shape, eye position, and the ideal brow characteristics. Women with long faces should have lower and straighter eyebrows to prevent adding to the impression of an already long face. For square faces, typically heralded by a broad, angular jawline, the brow peak should be very gradual and the lateral brow segment should point more inferiorly, which softens the otherwise angular face. Close-set eyes can be made to seem farther apart by starting the medial brow lateral to the medial canthus, whereas wide-set eyes can be counteracted by starting the medial brow medial to the medial canthus. Some of these subtle alterations, particularly of the medial and lateral extent, are achievable with plucking and dying alone. However, women typically do not pluck the superior aspect of the brow (to lower it) and cannot easily add hairs to the superior eyebrow. Hence, the surgeon should concentrate his or her attention on the height and shape of the superior brow margin, with particular attention on the location of the brow peak.

Box 1

Characteristics of the ideal youthful female eyebrow

- The medial limit is located at or below the orbital rim.
- There is a straight medial brow segment with a takeoff angle of 15° to 25°.
- The brow peak is located at the LC for younger women. The older the patient, the more medial the brow peak can be.
- The superior brow should be 20 to 25 mm above the LC.
- Plucking can subtly shape the brow to complement different eye and facial characteristics.

Knize recently stated that “debate over just how far the eyebrows should be elevated or...shaped is not warranted. A (woman will be pleased if) the lateral eyebrow segments (are) visibly higher than the medial segments...”²³ The authors agree that, given the wide variation in facial and eye dimensions, there is no mathematical solution to determine a universally beautiful female eyebrow. That said, it can be argued that there are multiple types of data (summarized earlier) that together yield an updated concept of the female brow that can be used during aesthetic forehead surgery (**Box 1**).

SUMMARY

According to fashion magazines, the ideal youthful female eyebrow is gradually becoming lower and flatter than it used to be, making it less different than the male eyebrow. The authors surmise that this is, in part, a response to the increasing parity between men and women in the workplace. With the eyebrow shape alone less able to convey femininity, the fullness or luminance of the female brow may become increasingly important. Some investigators have started using changes in the volume or luminance of facial regions following aesthetic and reconstructive surgery as an objective outcome.^{24,25} Lambros²⁶ and others have demonstrated that augmenting the volume of the upper lid *below* the brow to obscure the orbital rim and bring the tarsal crease closer to the lash line is incredibly effective at making the eye seem more youthful. In the future, adding volume to the upper lid–brow complex with injectable fillers, autologous fat, or fat transposition will augment and possibly supplant many of the traditional open and endoscopic brow-lift procedures.

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