The Asian Eye: Anthropometric Eye Measurements of Attractiveness in Young East Asian Women

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**Background:** Because of the high volume of Asian eyelid operations performed and the complexity of the Asian eye, there is a need to define exactly what anthropometric measurements determine attractiveness.

**Methods:** Eye photographs of young East Asian women were collected from publicly available sources online. Photographs were evaluated on a Likert scale ranging from 1 to 5 for attractiveness. Thirty-seven anthropometric measurements were collected using ImageJ from the most attractive and least attractive eyes to discover which features play the most important role in attractiveness.

**Results:** A total of 322 right eye photographs were evaluated for attractiveness. Sixty-six eyes received a median score of greater than or equal to 4.0 and were included in the attractive cohort. Forty-three eyes received a score of less than or equal to 2.0 and were included in the unattractive cohort. The superior brow peak was more lateralized compared to the upper lid crease and upper lid show ratio was found to be more associated with attractive eyes than with unattractive eyes. At the midpupillary line, the ratio was on average 1.58 ± 0.32 in attractive eyes and 1.22 ± 0.43 in unattractive eyes (p < 0.001). Eyes with convergence of the upper lid crease with the upper lash line were more likely to be deemed unattractive (p < 0.001).

**Conclusions:** East Asian eyes have specific anthropometric measurements that are more associated with attractiveness. These ideal measurements are different from those in Caucasians, suggesting ethnic variability in features defining attractiveness and a need to tailor surgical care appropriately. (*Plast. Reconstr. Surg.* 150: 1006, 2022.)

The eyes are among the most important aspects in the determination of facial beauty. People fixate on the eyes before all other facial anatomy. The aesthetics of eyes involves multiple anatomical components, including the iris, sclera, upper and lower eyelids, and eyebrow. The anthropometric measurements of attractiveness and youth in the orbital region has been well studied for Caucasians. These studies have identified several factors that correlate with youth and attractiveness, including a large visible height of the iris and a large upward and lateral inclination of the eye and eyebrow axis. Other studies have identified that attractive eyes exhibit decreased pretarsal show and progressive lateralization of the lash line, lid crease, and brow peaks.

The golden ratio has long been thought to be relevant to facial beauty and its dimensions. Particularly, the golden spiral was suggested to have a possible relation to the peak points of the different curvatures of the upper eye. These relations, however, are specific to Caucasian eyes and may not apply to eyes of other ethnicities, such as the anatomically complex East Asian eye.
literature on the anthropometric measurements of the East Asian eye has been thoroughly studied in relation to the effects of aging, but not in attractiveness. Studies looking at Asian eye attractiveness have been limited to small patient populations of only regional patients, failing to characterize the Asian eye more broadly.\textsuperscript{11–13} Youthful Asian eyes have shorter upper lid crease heights; taller vertical palpebral fissure heights; wider palpebral fissure lengths; narrower ranges of pretarsal fullness; and greater canthal tilt, endocanthion, and exocanthion angles.\textsuperscript{13–16}

In terms of attractiveness or beauty, double eyelids with a medium height have been deemed attractive from evaluators across varying ethnicities and ages.\textsuperscript{17} This is also reflected by the large demand for double-eyelid operations by Asian patients.\textsuperscript{18} These operations can be nuanced and result in an infold or an outfold with various heights and patterns.\textsuperscript{9,18,19} The objective of this study was to measure 37 anthropometric distances and angles to determine which play the most important role in attractiveness in young Asian eyes to help guide surgical technique.

It’s the little details that are vital. Little things make big things happen.

—John Wooden

**PATIENTS AND METHODS**

This study conforms to the Declaration of Helsinki, and was determined to be exempt by the Northwestern University Institutional Review Board (reference number STU00213637). Frontal facial photographs of young East Asian women were collected from publicly available sources online from August to October of 2020. Photographs with excessive makeup distorting key eye anatomy, nonneutral facial expression, ptosis, a single eyelid crease, and a negative intercanthal tilt were excluded. Images were rotated to standardize any sort of head tilt during photography. The periorbital area of each image was cropped and all left eyes were reflected about the vertical axis to maintain a standardized set of images. The images were evaluated on a Likert scale ranging from 1 to 5, with 1 representing extreme unattractiveness and 5 representing extreme attractiveness. Previous literature has shown that the ratings of attractiveness of Asian eyes when evaluated by observers of varying ethnicity remains consistent.\textsuperscript{17} Even with this cross-cultural consistency, we elected to use 10 evaluators of varying background, age, ethnicity, and sex. (See Figure, Supplemental Digital Content 1, which describes the evaluator demographics in more detail, http://links.lww.com/PRS/F407.) A total of 322 right eye images were rated by each evaluator. Evaluators underwent a training session in which they observed 10 unique eye photographs to develop their interpretation of attractiveness before assigning scores. “Attractive” eyes were defined as those with a median rating of greater than or equal to 4.0, whereas “unattractive” eyes were those with a median rating less than or equal to 2.0.

Image scale was set using iris diameter, which was validated to be an accurate method of scaling.\textsuperscript{20–22} The iris was scaled to 11.5 mm, the average horizontal visible iris diameter found in female Asians with low variability (±0.041 mm).\textsuperscript{23} Images from either the attractive or unattractive cohort were analyzed using ImageJ (National Institutes of Health, Bethesda, Md.). Figure 1 details the various anthropometric measurements and angles that were collected. A superior brow, inferior brow, upper lid crease, upper lash line, and lower lash line curvatures were drawn using multiple tracer points and spline fitting. The curvature peak points were identified using the maximum and minimum ImageJ functions. In addition, all angles were measured using the angle tool.

Continuous variables were analyzed using two-tailed $t$ tests, whereas categorical variables were compared using the Fisher’s exact test. All data analysis was conducted in R 4.0.2 (R Core Team, 2020). A value of $p < 0.05$ was considered statistically significant.

**RESULTS**

Three hundred twenty-two standardized right eye images were evaluated for attractiveness by 10 evaluators. Sixty-six eyes (20.5 percent) received a median rating of 4.0 or greater and were included in the attractive cohort, whereas 43 eyes (13.4 percent) received a median rating of 2.0 or lower and were included in the unattractive cohort.

When assessing the distance and location of peak points of the various curvatures, the superior brow peak, upper lid crease peak, and upper lash line peaks were the most important. Attractive eyes displayed shorter distances from the superior brow peak to the lateral canthus (23.02 ± 2.7 mm) and to the pupil center (24.16 ± 3.06 mm) compared to unattractive eyes, 26.18 ± 3.09 mm ($p = 0.001$) and 26.05 ± 3.35 mm ($p = 0.01$), respectively (Fig. 2). (See Table, Supplemental Digital Content 2, which shows peak points of eyelid curvatures in attractive versus unattractive eyes,
The superior brow peak was found to be significantly more lateral in attractive eyes compared to unattractive eyes \( (p < 0.001) \) (Fig. 3). The upper lid crease peak and upper lash line peaks were more medial in attractive eyes compared to unattractive eyes \( (p < 0.01 \text{ and } p < 0.001) \).

Analysis of the distances between curvatures revealed that upper lid show distances (between the inferior brow curvature and upper lid crease curvature) were shorter in attractive eyes at multiple points along the eye (Fig. 2). \( (^{\text{See Table, Supplemental Digital Content 3, which shows upper lid fold and pretarsal show heights and ratios in attractive versus unattractive eyes, http://links.lww.com/PRS/F410.}}) \) An opposite pattern of taller heights was seen with palpebral aperture heights (between upper and lower lash lines) at the punctum and medial limbus (Fig. 2). \( (^{\text{See Table, Supplemental Digital Content 5, which shows palpebral aperture measurements and ratios in attractive versus unattractive eyes, http://links.lww.com/PRS/F409.}}) \) Interestingly, a higher ratio of palpebral aperture height to upper lid show was seen in attractive eyes compared to unattractive at the punctum \( (0.69 \text{ versus } 0.40; p < 0.001) \), medial limbus \( (1.13 \text{ versus } 0.77; p < 0.001) \), midpupillary line \( (1.58 \text{ versus } 1.22; p < 0.001) \), and lateral limbus \( (0.84 \text{ versus } 0.75; \ p = 0.03) \) (Fig. 4) \( (^{\text{see Table, Supplemental Digital Content 5, http://links.lww.com/PRS/F411.}}) \) The ratio of upper lid show to pretarsal show tended to be lower in attractive eyes.

The position of the lateral canthus was found to be closer to the midpupillary line in attractive patients, whereas no difference was found in the intercanthal height, intercanthal angle, or ratio of pretarsal show at the midpupillary line to the punctum in attractive versus unattractive eyes. \( (^{\text{See Table, Supplemental Digital Content 6, which shows eye angle measurements in attractive versus}} \)
unattractive eyes. *IT*, intercanthal tilt; *Ex*, exocanthions; *En*, endocanthion; *Conv*, convergence; *P*, punctum, [http://links.lww.com/PRS/F412](http://links.lww.com/PRS/F412). See Table, Supplemental Digital Content 7, which
shows miscellaneous measurements in attractive versus unattractive eyes. *MP, midpupillary; P, punctum; Conv P, convergence point, http://links.lww.com/PRS/F413.* Attractive eyes were less likely to have convergence points (31.8 percent), compared to unattractive eyes (69.7 percent) (*p* < 0.001). The opening angle or location of the convergence point along the upper lash line did not vary significantly between the attractive and unattractive cohorts.

**DISCUSSION**

An understanding of what specifically makes an Asian eye attractive can significantly improve the preoperative plan and surgical approach to lead to a more aesthetic outcome. The majority of studies on the Asian eye have focused on anatomy, racial differences in measurements, age-related changes, and postsurgical outcomes.\textsuperscript{14,17–19,24} However, to our knowledge, no study has used the defining curvatures of the periocular region to investigate what measurements separate attractive from unattractive young Asian eyes. Using hundreds of online images and image analysis software allows for a more comprehensive set of measurements and a heterogeneous sample to determine Asian eye attractiveness broadly. Previous studies looking at attractiveness were limited to smaller sample sizes of local populations and fewer measurements performed manually in the clinic.\textsuperscript{12} Our findings suggest that attractive young female Asian eyes conform to specific positional relations of peak points of eyelid curvatures, proportions of palpebral aperture heights to upper lid show, and aesthetic angles.

A superior brow peak that was more lateralized than the upper lid crease peak and upper lash line peak was found to be more attractive. In addition, a superior brow peak with shorter distances to the midpupillary point and lateral canthus as shown in Figure 2 was also more attractive. Interestingly, during the normal aging process in the Caucasian eye, the upper lid crease peak can medialize, leading to a more unattractive appearance.\textsuperscript{6,7} In contrast, in youthful Asian eyes, a more medialized upper lid crease peak was found to be more attractive than lateralized. More important, however, may be the relationship between the superior brow peak, the upper lid crease peak, and upper lash line peak. The superior brow peak was approximately 8 degrees counterclockwise to these two peaks in attractive eyes, whereas in unattractive eyes it was approximately 6 degrees clockwise. In Caucasian eyes, the goal is to lateralize these peak points as much as possible to combat the aging process. However, in the Asian eye, this approach must be cautioned, as too far of a lateralization can lead to an undesired aesthetic. In addition to brow lift and neuromodulator use, epilation and ultrafine tattooing may be useful tools in helping to appropriately place the brow.

The golden ratio has been suggested to play a role in the ideal relations of the upper eyelid curvature peak points in attractive Caucasian eyes.\textsuperscript{6} However, in Asian eyes we found no significant difference in the coefficient of determination (*R*^2^), which approximates “goodness of fit” from either
cohort to the spiral. [See Figure, Supplemental Digital Content 8, which shows the application of the golden spiral to attractive and unattractive cohorts. The golden ratio,

$$\varphi = \frac{1 + \sqrt{5}}{2} = 1.61803\ldots,$$

was used to generate a golden spiral. All attractive and unattractive eye photographs were scaled to the same lateral canthus–to-midpupillary distance. The plots show the fit of the various peak points approximating the golden spiral. There is marginal difference in the “goodness of fit” ($R^2$) between cohorts, signifying its limited use in predicting attractive orbital aesthetics in Asian eyes. The golden ratio may rather predict normal human anatomical relations, http://links.lww.com/PRS/F414.)

It is important to note that compared to the Caucasian eye, the Asian eye’s inferior brow peak approximated the spiral more closely than the superior brow peak. Although the difference in fit between both cohorts was not significantly different, there was a statistically significant correlation of the peak points approximating the spiral in both groups ($p < 0.001$). This signifies that the golden spiral may be a better approximation for normalcy in human eye anatomy rather than attractiveness.

More importantly, this study found stark differences in measurements between attractive and unattractive eyes. Our study demonstrated the significance of a shorter upper lid show in the attractive group and a greater ratio of the palpebral aperture heights to the upper lid show along the various points of the eye. These relations highlight the importance of the shape of the eye determined by the lash lines relative to the periorbital region. In other studies, youthful Asian eyes have displayed greater palpebral aperture heights and wider fissures. Our findings show no difference in maximum palpebral aperture heights or fissure widths, suggesting that the differences in attractiveness are not attributable to a perceived aging effect or a more ptotic appearing eye, but are rather attributable to the overall shape and openness of the eye relative to upper lid show. When trying to optimize the aesthetic of the Asian eye whether through blepharoplasties, brow lifts, or soft-tissue fillers, it is imperative to minimize the upper lid show and maximize palpebral aperture heights. A ratio of palpebral aperture height to upper lid show at the midpupillary line was found to approximate 3:2 in attractive versus 1:1 in unattractive Asian eyes. These ratios should begin to increase laterally from the punctum to the midpupillary line and then continue to decrease past the lateral limbus. Burusapat et al. performed a study investigating Asian eye attractiveness in a smaller subset of patients restricted to the local population of a hospital in Thailand and found a similar pattern of increased palpebral fissure heights to upper lid show in attractive patients. They also did not observe an increased palpebral fissure width.

Although in Caucasian eyes, the upper lid–to–pretarsal show ratio serves as a useful tool in approximating beauty as large ratios that taper laterally to medially, the amount of pretarsal show is not nearly as important in Asian eyes, which have very little pretarsal show in comparison. In contrast, lower ratios were more attractive in Asian eyes. Vaca et al. have proposed that this ratio in Caucasians should average between 1.8× and 3×, whereas Morley et al. have proposed 3× to 5×. In the attractive Asian eye, we found they ranged on average from 2.7× to 8×. Furthermore, although a more pronounced upper lid show is more attractive in Caucasians, especially at the point of the lateral canthus, a similar trend was deemed more unattractive in Asians, which further highlights vast differences in what determines attractiveness in different ethnicities.

Double-eyelid surgery is one of the most popular cosmetic operations performed on Asian patients. The goal of this operation may appear to be to simply westernize the Asian eye, but there are more subtleties to consider. Patients can desire different types of double eyelids including the moderate epicanthal fold, outfold with a nasally tapered crease, or infold with a parallel crease type. The novelty of our study is that it includes evaluation of measurements of the most surgically relevant aspects of double-eyelid surgery. For the moderate epicanthal fold type, the upper lash line and upper lid crease converge into an epicanthal fold. The location of this convergence and the angle that results can be surgically altered. Our results show that moderate epicanthal folds were more likely to be included in the unattractive cohort. In addition, the location of the convergence and opening angle did not differ between those moderate epicanthal folds that were attractive versus unattractive. When it comes to infold versus outfold double eyelids, patients have traditionally been left to select their own preference. Our results show that the ratio of pretarsal show at the midpupillary line compared to the punctum was not any different between groups, but pretarsal show was greater at the punctum in attractive
patients. Therefore, tapering of the pretarsal show nasally may not affect attractiveness, provided that there is ample pretarsal show, which is 2.34 mm on average at the punctum for attractive eyes. This can be adjusted based on the position of the epicanthal flap intraoperatively. A more nasally sutured flap will result in a larger pretarsal show. In addition, a larger angle was seen at the lower lash line near the bend of the punctum in attractive eyes, which creates a smoother contour. This smoothness in contour of the lower lash line should be strived for during alteration of the medial canthus during any surgery.

For the Asian eye, a lateral canthoplasty has been traditionally performed to increase palpebral fissure width and lateral canthus-to-midpupillary distance, creating a larger and brighter eye.26,27 Contrarily, our results found no significance of the palpebral fissure width and actually found that attractive eyes on average were approximately 1 mm shorter in their lateral canthus-to-midpupillary line distance compared to unattractive eyes. It may be possible that the vertical dimension of the openness of the eye is more important than the horizontal dimension, which is why we may have not captured such a difference. Furthermore, this finding strengthens the notion that a lateral canthoplasty should be performed to move the lateral canthus in a posterior direction to maintain contact of the bulbar and palpebral conjunctiva while following the eyeball shape rather than shifting it laterally.26 It is also noteworthy that the angle at the exocanthion was larger in attractive eyes by almost 8 degrees on average, supporting the idea of greater openness and the need to preserve the lateral canthal angle during a lateral canthoplasty.27–29 Figure 5 illustrates examples of preoperative approaches to Asian eyes based on the conclusions herein.

The analysis performed herein can be a useful tool to guide surgical management for more aesthetically enhanced Asian eyes but by no means should be strictly applied. The recommended measurements and angulations are based on averages.

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**Fig. 5.** Example preoperative planning and possible interventions. A white circle has been placed around the iris of each eye to standardize distances. *(Above, left)* The diagnosis is a medialized superior brow peak. The correction involves lateralization of this peak point without excessive increase in the upper lid show. *(Above, right)* The diagnosis is excessive upper lid show, infold double-eyelid crease, and decreased palpebral aperture height. The correction involves decreasing the upper lid show, removing the infold (convergence point), and increasing the palpebral aperture height. *(Below, left)* The diagnosis is an infold double eyelid with a lack of medial pretarsal show relative to upper lid show. This can be corrected with a medial epicanthoplasty. *(Below, right)* The diagnosis is a lateralized upper lid crease and lash line peak. The correction involves medialization of this peak point, removal of excess upper lid skin, and reshaping to allow for a more lateralized superior brow peak relative to upper lid crease and lash line peak. (The commercial use licenses to each photograph in this figure were purchased.)
Each eye is unique and requires its own careful analysis, surgical judgment, and adherence to a patient’s desires. The measurements collected are not meant to reflect exact measurements, as this study was limited to online photographs, which can have varying resolution, alterations of angles, and differing scale. We were able to mitigate most of these effects by careful selection of only neutral expression frontal face photographs in addition to rigorous standardization of head axis tilts and scale with respect to iris length. However, the proportional relations of angles, positions, and ratios increase the external validity. Eyes with excessive makeup were excluded to reduce any confounding effect, and those eyes with makeup were similarly represented in both groups. Furthermore, the goal of any operation should focus on a patient’s desired outcome. The recommendations provided in this study are meant to be used only as tools in the preoperative planning phase.

Future research should focus on anthropometric measurements of attractiveness in different ethnicities, as a one-size-fits-all approach to patients may lead to undesired outcomes. It may seem paradoxical that Asian eyes benefit from double-eyelid operations, a method to supposedly westernize the eye. However, it must be noted that a visible upper lid crease is also a phenomenon indigenous to many Asian populations. By creating double eyelids in single-crease Asian patients, attractiveness may increase, but it may be because of mimicking of other naturally aesthetic Asian eyes rather than any sort of Caucasian eye. The proposed anthropometric features that determine attractiveness in Caucasians were not upheld in this study, further evidencing the uniqueness in the blueprint of the attractive Asian eye.

**CONCLUSIONS**

Attractive Asian eyes are those with greater palpebral aperture heights-to-upper lid show distances. A lateralized superior brow peak in relation to the peaks of the upper lid crease and upper lash line distinguishes attractive eyes. In addition, we found that shorter distances from the superior brow peak to the midpupillary line and lateral canthus are another quality of attractive eyes. Asian double eyelids without a convergence point of the upper lid crease and lash line were more likely to be attractive. Tapering of the pretarsal show nasally does not lead to more attractive results. The features that make an Asian eye attractive differ significantly from what makes a Caucasian eye attractive, suggesting that ideal anthropometric measurements vary according to race and ethnicity. Anthropometric measurements found in attractive young Asian eyes may serve as a useful tool in preoperative design and procedural technique to lead to more desirable aesthetic outcomes.

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