Nasal Aesthetics: A Cross-Cultural Analysis

Peter N. Broer, M.D.
Samuel Buonocore, M.D.
Angie Morillas, M.D.
Jong Liu, M.D.
Neil Tanna, M.D., M.B.A.
Marc Walker, M.D., M.B.A.
Ruben Ng, M.S.
John A. Persing, M.D.

New Haven, Conn.

Background: Plastic surgeons often approach nasal aesthetic evaluation with the aid of seemingly objective measurements. However, ideal measurements of an attractive nose, as suggested in the literature, might not apply on a cross-cultural basis. Given these controversies, this study aimed to investigate the cultural and ethnic impact on nasal shape preferences.
Methods: Computerized images of a model's nose were generated in which the nasal width, root, tip, dorsum, and projection of the lips and chin could be altered. A survey containing these images was sent to over 13,000 plastic surgeons and lay people in 50 different countries, with a total response rate of 9.6 percent. Demographic information about the interviewees was obtained.
Results: Preferred dimensions of the nose were broken down according to geographic, ethnic, occupational, and sex variables. Interregional comparison revealed that plastic surgeons from Latin America and the Caribbean overall prefer smaller and narrower noses, with more projecting tips, lips, and chins. Similar trends hold true when analyzing results from the general public. Significant differences were found comparing preferences between plastic surgeons and the general public. Plastic surgeons preferred wider nasal roots and tips and, in combination, more projected nasal dorsi, tips, lips, and chins.
Conclusions: No universal parameter can define ideal aesthetics of the nose across cultures and ethnic backgrounds. As demonstrated, geographic, ethnic, and cultural factors influence aesthetic perceptions of patients and surgeons. (*Plast. Reconstr. Surg.* 130: 843e, 2012.)

The face is a crucial contributor to an individual's personality and emotions. Facial appearance will influence how a person perceives herself or himself and, likewise, is being perceived by others. Especially the nose, with its prominent central position, captures the attention of the observers and markedly influences their perception.[1] As Sushruta (500 B.C.) described, of all the organs in the body, the nose is considered the primary organ in relation to respect and reputation. Given its importance and power to change the appearance of an entire face, to achieve optimal results of cosmetic rhinoplasty, the plastic surgeon needs to have a detailed knowledge of the complex anatomy of the nose and available rhinoplasty techniques. However, even the most skilled plastic surgeons might encounter a patient who is unsatisfied with the results of the rhinoplasty, despite a technically well-performed procedure. The most probable underlying reason is that the patient's preferences regarding the "ideal shape" do not correspond with the surgeon's. Consequently, understanding the patient's preferences is as valuable as the surgical technique. However, interpretations of facial proportions, including nasal shape, are variable and depend on the observer's personal preferences.[2]

Although plastic surgeons approach the aesthetic evaluation of a nose with the aid of universal, seemingly objective, linear and angular measurements, the overall impression depends largely on the individual's judgment.[3] Although this judgment or "aesthetic sense" is known to be strongly influenced by repeated observations, people's relation to concepts of beauty, and the media, it remains largely unknown to what extent it is influenced by sex, age, ethnicity, and social background.[4–10]

Furthermore, nasal aesthetics are defined not solely by metrics but rather by proportion, balance, and harmony with the rest of the face. Ideal proportions and measurements, which aim to define an attractive nose, and their influence by cer-

From the Section of Plastic and Reconstructive Surgery, Department of Surgery, Yale University School of Medicine.
Received for publication May 10, 2012; accepted June 27, 2012.

DOI: 10.1097/PRS.0b013e31826da0c1

Disclosure: *The authors have no financial interest to declare in relation to the content of this article.*

tain facial structures such as the lips and chin, are frequently described in the plastic surgery literature.[11–14] However, they might not be valid on a cross-cultural basis.[3] Caution should be exercised if these standards are to be applied universally, particularly across different cultures and ethnic groups around the world. Given the potential differences in the definition and recognition of an attractive nose, this study investigates the presence of such differences and how these are related to the interviewee's occupation, cultural and ethnic background, and personal experience with aesthetic surgery. Only when plastic surgeons are aware of their patients' and their own preferences regarding the shape of the nose will they be successful in satisfying their patients' needs.[15]

METHODS

Standardized profile photographs were taken of a volunteer female model. These were then modified using digital imaging software (Adobe Photoshop CS5; Adobe Systems, Inc., San Jose, Calif.) to enable the respondent to alter individual elements in the shape of the model's nose. The modifications allowed the user to apply augmentation or reduction in a positive and negative range of three levels on each of the following parameters of the nose shape:

- Nasal root width.
- Nasal tip width.
- Nasal base width.
- Nasal dorsum and tip in combination.
- Nasal dorsum projection.
- Nasal tip projection.
- Degree of the nasal bridge curvature.
- Nasolabial angle.
- Columellar show.
- Lip projection.
- Chin projection.

The possible alterations reflect structural characteristics that are typically manipulated during rhinoplasty to reshape the patient's nose and achieve the preferred result. The 11 modifiable photographs were accompanied by a questionnaire to collect classifying demographic information about the surveyed individuals.

This online survey (http://plastics.yale.edu/jong/nose/) was sent to over 13,000 people, including plastic surgeons and the general public in 50 countries (based on an international survey on aesthetic/cosmetic procedures regarding highest percentage of plastic surgeons and procedures; International Society of Aesthetic Plastic Surgery, 2010). In addition, plastic surgeons were contacted through their national societies and members of the general public were selected randomly by means of social networks.

Data were collected in North America (Canada and the United States), Latin America and the Caribbean (Argentina, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Jamaica, Mexico, Panama, Peru, and Venezuela), Western Europe (Austria, Belgium, Croatia, France, Germany, Greece, Hungary, Italy, Norway, Poland, Portugal, Spain, Sweden, Switzerland, The Netherlands, and the United Kingdom), Oceania (Australia), Eastern Asia (China, Japan, and Republic of Korea), Southern Asia (India, Iran, and Pakistan), Southeast Asia (Thailand and Viet Nam), Western Asia (Cyprus, Iraq, Israel, Jordan, Kuwait, Lebanon, Turkey, and United Arab Emirates), and Northern Africa (Egypt, Morocco, and Tunisia).[16] In the case where the authors received numerous responses, these were grouped by major geographic region based on regional definitions from the United Nations into groups from North America ($n = 330$), Latin America and the Caribbean ($n = 244$), and Western Europe ($n = 91$). The interviewees were able to modify each of the 11 photographs by choosing one of six options, each of them representing a gradient of reducing or augmenting the specific nasal area under investigation (Fig. 1).

Demographic data collected included information on sex, age, country of residence, ethnic background, and personal previous surgical history of rhinoplasty. By interpreting the statistics, preferences concerning the optimal shape and dimension of the model nose were defined.

RESULTS

The authors achieved a response rate of 9.6 percent. A total of 1226 responses were received. The number of plastic surgeons who responded to the survey was 720 (612 men and 108 women), and the number of the general public who responded to the survey was 506 (145 men and 361 women). Of all respondents, 39 percent were women.

Respondents were aged between 18 and 87 years, with a mean age of 40 years. The mean age of plastic surgeons and of the general public was 50.2 and 30.3 years, respectively (Fig. 2).

The majority of plastic surgeons who replied to the survey were Caucasians [$n = 512$ (71 percent)], followed by Hispanics [$n = 115$ (15 percent)]. The general public followed a very similar ethnic distribution (Fig. 3). Of the surveyed plastic surgeons, 11 percent had undergone a rhinoplasty

Fig. 1. Sample images of questionnaire.

themselves, whereas only 7 percent of the general public had.

Plastic Surgeons by Geographic Region

Responses from plastic surgeons from North America, Latin America and the Caribbean, and Western Europe were compared, and the results showed that wider nasal roots were preferred by plastic surgeons living in North America and Western Europe, compared with surgeons living in Latin America and the Caribbean ($p = 0.006$). When evaluating the root, bridge, and tip of the nose in combination, a preference for narrower nasal proportions was observed among surgeons living in Latin America and the Caribbean com-

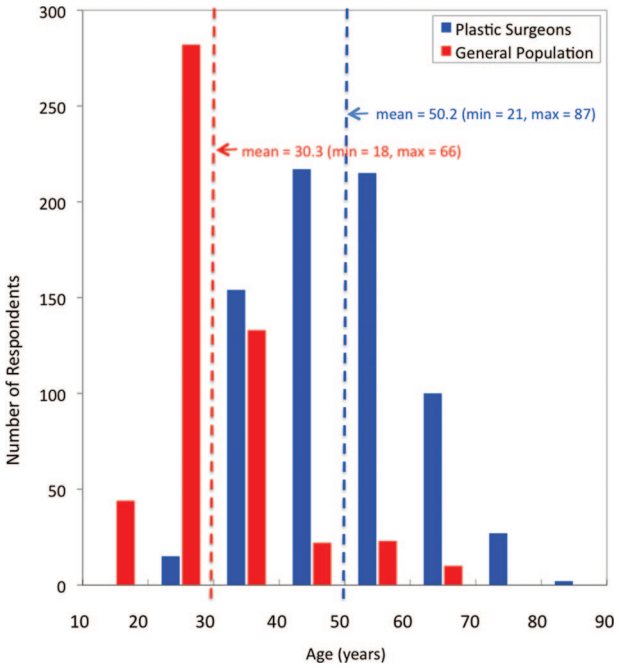


Fig. 2. Age distribution of respondents.

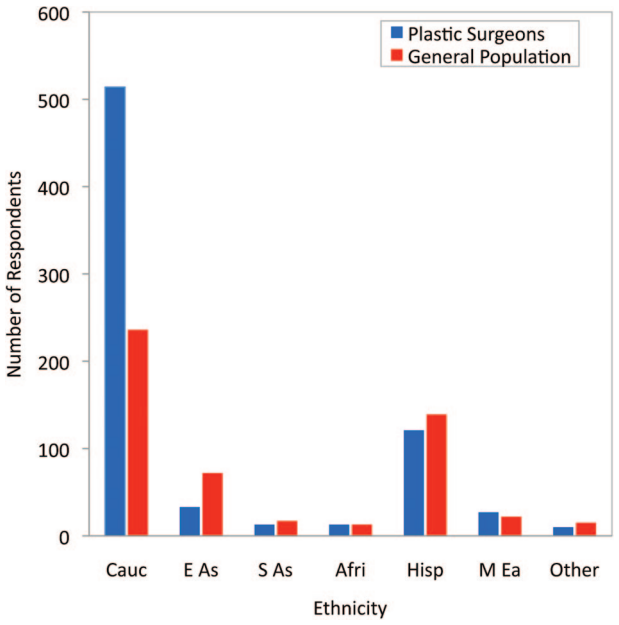


Fig. 3. Distribution of respondents' ethnicities. *Cauc*, Caucasian; *E As*, East Asian; *S As*, South Asian; *Afri*, African; *Hisp*, Hispanic; *M Ea*, Middle Eastern.

pared with plastic surgeons in North America and Western Europe.

Analyzing the aesthetic preferences regarding the height of the nasal root, there was a tendency for the Latin America and Caribbean group to choose a less projected nasal root. However, this result was not statistically significant ($p = 0.7$).

More tip projection was selected by surgeons from Latin America and the Caribbean compared with those from North America ($p < 0.001$) and Western Europe ($p = 0.006$). Also, surgeons from Latin America and the Caribbean preferred more obtuse nasolabial angles than surgeons from North America ($p < 0.001$) and Western Europe ($p < 0.05$) and less columellar show than North American surgeons ($p = 0.050$). Surgeons from both North America and Latin America and the Caribbean selected a slightly more pronounced curvature of the nasal bridge than those from Western Europe ($p = 0.04$ and $p = 0.02$, respectively). In terms of lip and chin projection, surgeons from Latin America and the Caribbean thought augmented projection of the lips and chins is more desirable than did Western European surgeons ($p = 0.047$ and $p = 0.024$, respectively). The latter was also true for North American surgeons, who chose more projected chins than Western European surgeons ($p = 0.009$).

General Public by Geographic Region

Respondents from the general public followed tendencies similar to those of plastic surgeons from their respective regions. The general public from Latin America and the Caribbean ($n = 135$) selected narrower nasal roots than those from North America ($n = 328$) ($p = 0.025$) and Western Europe ($n = 28$) ($p = 0.094$).

The general public living in Latin America and the Caribbean also selected narrower combinations of root, bridge, and tip of the nose than respondents from North America ($p < 0.018$), and more projected nasal tips ($p = 0.012$), more projected chins ($p = 0.001$), and more obtuse nasolabial angles ($p = 0.055$) compared with the North American general public. Respondents from North America opted for more obtuse nasiolabial angles than the Western Europe general public ($p = 0.045$).

Plastic Surgeons Compared with the General Public

Differences were also found when the respondents were divided into two groups based on their occupation. Plastic surgeons as a single group ($n = 720$) were compared with the general public group ($n = 506$). The group of plastic surgeons preferred more projecting nasal roots and tips in addition to lips and chins than did the general public.

Selections regarding the width of the nasal root and apex were significantly different also,

with surgeons choosing wider measurements for both features. Results are presented in Table 1 and Figure 4.

In a subsequent step, these two groups were then broken down by ethnicity. For this analysis, the two predominant ethnic groups among the respondents, Caucasians and Hispanics, were selected. The results of plastic surgeons and the general public, of the same ethnicity, were then assessed as follows.

Caucasian Plastic Surgeons versus Caucasian General Public

When comparing Caucasian plastic surgeons ($n = 512$) with the Caucasian general public ($n = 233$), some of the previously observed trends held true. Whereas Caucasian plastic surgeons selected slightly wider nasal dorsum ($p < 0.01$) and wider combinations of dorsum and tip of the nose ($p < 0.01$) than the Caucasian general public, they specifically chose a narrower nasal tip ($p = 0.03$) more often. Also, augmentation of the projection of nasal roots ($p < 0.01$) and nasal tips ($p < 0.01$) was observed more frequently among Caucasian plastic surgeons than among the Caucasian general public. Furthermore, Caucasian plastic surgeons select a more obtuse nasolabial angle ($p < 0.01$) and more projected lips ($p < 0.01$) and chins ($p < 0.01$) than the Caucasian general public. There was a statistically significant difference in the choice of columellar show that followed the same trend, with Caucasian surgeons preferring less columellar show ($p = 0.01$).

Hispanic Plastic Surgeons versus Hispanic General Public

When assessing the projection of the nasal root, Hispanic plastic surgeons ($n = 115$) tended to augment the projection of the nasal roots more than the Hispanic general public ($n = 136$) ($p < 0.01$). Hispanic surgeons also selected more projected nasal tips ($p < 0.01$), lips ($p = 0.03$), and chins ($p < 0.01$), and wider nasal tips ($p < 0.01$) and less columellar show ($p = 0.03$) than the Hispanic general public. The difference was statistically not significant for nasolabial angles or width of nasal root.

Table 1. Comparison of Nasal Aesthetics as Reported by Plastic Surgeons and the General Public

	Plastic Surgeons ($n = 720$)	General Public ($n = 506$)	p
Nasal root width	+1.5	+1.0	1.3×10^{-10}
Nasal apex width	–0.8	–1.3	2.1×10^{-7}
Nasal base width	–0.9	–0.8	0.13
Nasal root, bridge, and tip combination	+0.4	+0.3	0.04
Nasal root projection	+1.3	+0.6	8.6×10^{-15}
Nasal tip projection	–1.7	–2.4	9.4×10^{-13}
Degree of nasal bridge curvature	–1.0	–1.0	0.48
Nasolabial angle	–0.1	–0.2	0.26
Height of columellar show	–0.2	–0.3	2.1×10^{-4}
Lips projection	0.0	–0.4	2.9×10^{-7}
Chin projection	+1.2	+0.7	2.2×10^{-9}

Caucasians versus Hispanics

The analysis of the results of the two largest ethnic groups of this survey, composed of plastic surgeons and the general public, follow trends similar to those observed among plastic surgeons and the general public, with few exceptions. Hispanic plastic surgeons and the general public selected narrower nasal roots ($p < 0.0001$) and overall narrower combinations of root, bridge, and tip of the nose ($p < 0.0001$) than Caucasians, in addition to more projected nasal roots ($p = 0.02$), nasal tips ($p = 0.02$), and lips ($p = 0.07$). They also chose more obtuse nasolabial angles ($p = 0.01$) compared with Caucasians. The results are shown in Table 2 and Figure 5.

Caucasians versus East Asians

The comparison of results from Caucasians and East Asians showed most striking differences in the projection of the nasal tips, lips, and chins. Despite a smaller number of responses, the East Asian ($n = 102$) public selected more projected nasal tips and less projected lips and chins than the Caucasian public ($n = 745$) ($p < 0.01$ in all cases). Furthermore, the analysis showed that East Asians selected wider nasal apices ($p = 0.03$) and wider nasal bases ($p = 0.02$) more frequently. No significant difference was shown regarding projection of the nasal root.

Rhinoplasty versus Nonrhinoplasty Respondents

When comparing the relatively small group of Caucasians rhinoplasty respondents ($n = 65$) to Caucasians who had not undergone rhinoplasty ($n = 680$), significant differences were seen only when comparing the combinations of nasal root, bridge, and tip width. Here, Caucasians who had undergone rhinoplasty chose a narrower width ($p = 0.001$) and a more obtuse nasolabial angle ($p = 0.02$). A more obtuse nasolabial angle was selected by the Hispanic public following rhinoplasty when compared with the public in the same ethnic group that denied having undergone this operation ($p = 0.08$).

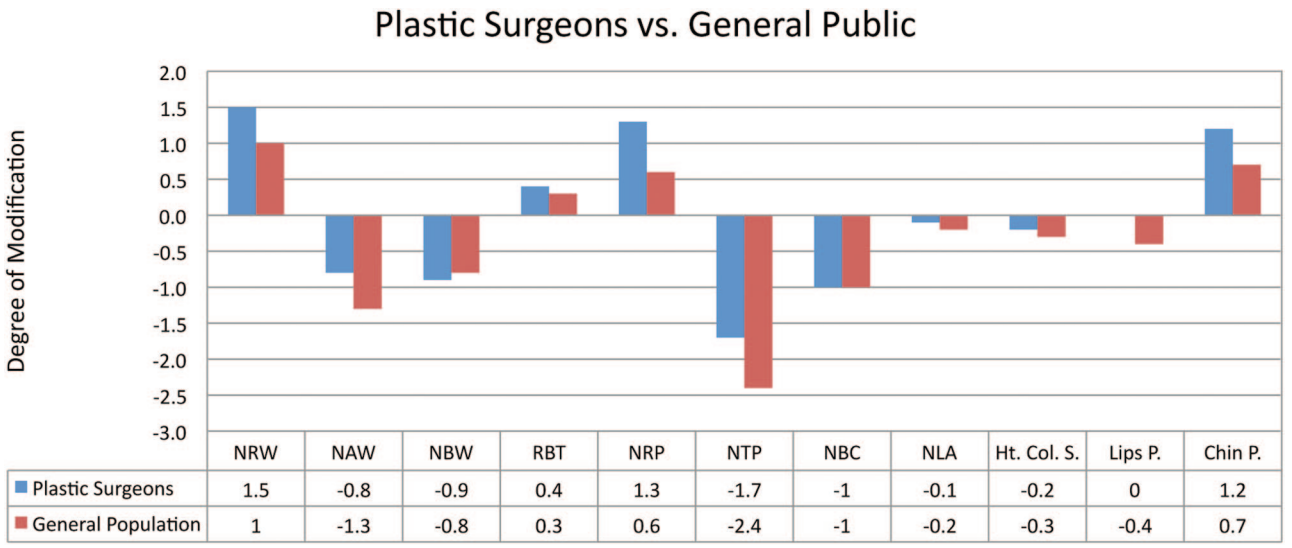


Fig. 4. Plastic surgeons versus the general public. *NRW*, nasal root width; *NAW*, nasal apex width; *NBW*, nasal base width; *RBT*, nasal root, bridge, and tip combination; *NRP*, nasal root projection; *NTP*, nasal tip projection; *NBC*, degree of nasal bridge curvature; *NLA*, nasolabial angle; *Ht. Col. S.*, height of columellar show; *Lips P.*, lips projection; *Chin P.*, chin projection.

Table 2. Comparison of Nasal Aesthetics as Reported by Caucasians and Hispanics

	Caucasians (n = 745)	Hispanics (n = 251)	p
Nasal root width	+1.4	+0.9	<0.0001
Nasal apex width	–1.2	–1.0	0.24
Nasal base width	–0.9	–0.9	0.92
Nasal root, bridge, and tip comnination	+0.4	+0.1	<0.0001
Nasal root projection	+1.1	+0.8	0.02
Nasal tip projection	–2.0	–1.7	0.02
Degree of nasal bridge curvature	–1.0	–1.0	0.45
Nasolabial angle	–0.2	+0.1	0.01
Height of columellar show	–0.2	–0.2	0.14
Lips projection	–0.1	–0.3	0.07
Chin projection	+1.0	+1.1	0.42

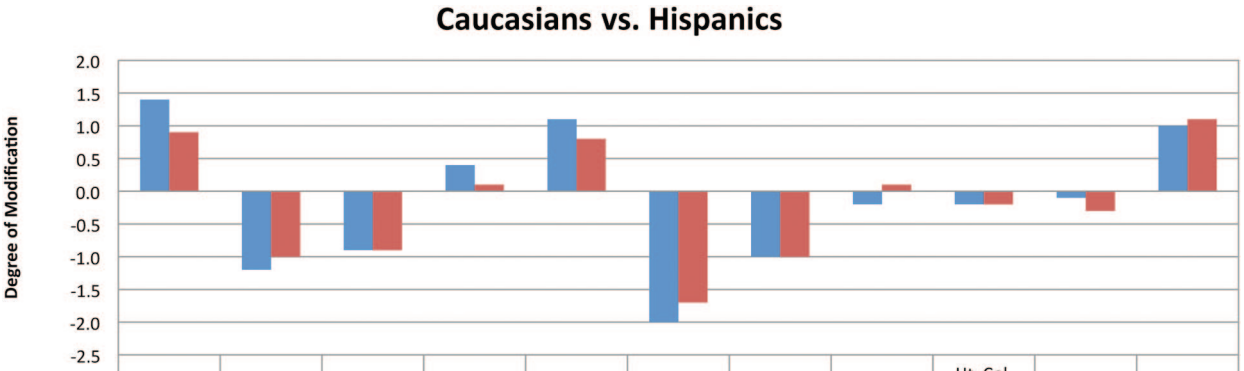
DISCUSSION

Many of the aesthetic parameters from one group of individuals are surprisingly different from the widely used standards.[10] Repeated observations have shown that the averages of beauty often cited in the literature are not favored by nature; mean nasal and craniofacial measurements were found beautiful in only 12 percent of attractive faces in previous studies.[3] This study was aimed at examining how occupation, cultural and ethnic background, and personal history of rhinoplasty alter the perception of facial aesthetics.

The visual impression of a "beautiful" nose is influenced by the relationship of the nose to the face and by the proportions of the nose itself. To evaluate the aesthetic preferences of plastic surgeons and the general public, the authors surveyed representatives of these groups from 50 countries around the world.

The results highlight that plastic surgeons from Latin America and the Caribbean find smaller, narrower noses with a more projecting tip along with prominent lips and chins more attractive when compared with surgeons from North America and Western Europe. Similar trends hold true when comparing preferences of the general public from these regions, with the main difference being that the general public from North America seems to find more projecting nasal roots more attractive.

When comparing alterations of the model's nose from plastic surgeons to the changes applied by the general public, the authors again found significant differences, with surgeons favoring a wider nasal root and apex and more projected nasal roots, tips, lips, and chins. It must be noted that, when interpreting the results of plastic surgeons and the general public, plastic surgeons who replied to the questionnaire consisted predominantly of male respondents that were on average 20 years older than respondents from the general public. Differences in preferences between these two groups might therefore be related to their differences in age and sex.[9] When comparing respondents who underwent rhinoplasty with those who did not, results showed that Caucasians and Hispanics following rhinoplasty preferred a narrower nose and a more obtuse naso-



	NRW	NAW	NBW	RBT Comb.	NRP	NTP	NBC	NLA	Ht. Col. S.	Lips P.	Chin P.
Caucasians	1.4	-1.2	-0.9	0.4	1.1	-2.0	-1.0	-0.2	-0.2	-0.1	1
Hispanics	0.9	-1	-0.9	0.1	0.8	-1.7	-1	0.1	-0.2	-0.3	1.1

Fig. 5. Caucasians versus Hispanics. *NRW*, nasal root width; *NAW*, nasal apex width; *NBW*, nasal base width; *RBT*, nasal root, bridge, and tip combination; *NRP*, nasal root projection; *NTP*, nasal tip projection; *NBC*, degree of nasal bridge curvature; *NLA*, nasolabial angle; *Ht. Col. S.*, height of columellar show; *Lips P.*, lips projection; *Chin P.*, chin projection.

labial angle, which held true for patients and surgeons alike.

The results of this study underscore the fact that there is not a universal definition of the "ideal nose." The measurements and parameters of the "perfect" nose, mentioned in the literature and recommended by textbooks, lack practicality when it comes to patient satisfaction. This study showed that there exist major differences in aesthetic perception among plastic surgeons and the greater public depending on their sex, age, country of origin, and ethnic background. Attempting to define universally valid numerical values for beauty can lead to much dissatisfaction among patients and surgeons because of individual preferences influenced by ethnicity and culture.

It is often assumed that Western society is most influential in establishing standards and ideals of beauty. Several studies have been conducted to evaluate facial attractiveness over a cross-cultural basis and show that when asked to choose attractive faces, preference was given to the same faces independent of the ethnic background of the evaluator.[5,8]

Furthermore, features that are universally considered to be attributes of a "young" face such as wide eyes, small chins, and small noses, are rated attractive across cultures.[17] These findings have been replicated across female faces of Asian, Hispanic, and African American decent.[18]

The findings of this study, however, seem to differ from the referenced results to some degree, in that the study found significant differences regarding nasal aesthetics across cultures. This may be related to the fact that, in previous studies, the differences in evaluated faces were lacking the nuances that were possible to identify in this study and also in that those studies were not focused solely on the nose.

Limitations of the study include the fact that the selection of the general public was done by means of social networks (i.e., friends and friends of friends of the authors who were asked to contribute to the study), which leads to a certain selection bias. However, this method enabled random selection of respondents across multiple cultures and social backgrounds.

In conclusion, plastic surgeons need to understand their patients' preferences and respect their definitions of the "ideal nose" rather than strictly adhering to metric numbers presented in the literature.[11–14]

Given the fact that the observed alterations of this study are based on modified computer images, the results may not translate uniformly to real patients. All respondents, however, used the same images and were therefore influenced by the same confounding factors. Although the study was also limited regarding total number of respondents in specific regions, overall, considering ethnicity, the authors found significant differences when evaluating nasal shape preferences of surgeons and the general public.

In light of an ever more globalizing environment and patient pool, it is therefore of utmost importance to consider these differences in preferences when discussing optimal nasal shapes and treatment goals among plastic surgeons and when evaluating and treating patients with different ethnic backgrounds.

John A. Persing, M.D.
Section of Plastic and Reconstructive Surgery
330 Cedar Street, BB330
New Haven, Conn. 06520
john.persing@yale.edu

PATIENT CONSENT

The patient provided written consent for the use of her images.

REFERENCES

1. Reis S, Braga A, Abrão J, Filho L, Claro C. Análise facial subjetiva. *Rev Dental Press Ortodon Ortop Facial Maringá* 2006; 5:159–172.
2. Moses S, Last U, Mahler D. After aesthetic rhinoplasty: New looks and psychological outlooks on post-surgical satisfaction. *Aesthetic Plast Surg.* 1984;8:213–217.
3. Farkas LG, Kolar JC, Munro IR. Geography of the nose: A morphometric study. *Aesthetic Plast Surg.* 1986;10:191–223.
4. Springer IN, Zernial O, Warnke PH, Wiltfang J, Russo PA, Wolfart S. Nasal shape and gender of the observer: Implications for rhinoplasty. *J Craniomaxillofac Surg.* 2009;37:3–7.
5. Thakerar J, Iwawaki S. Cross-cultural comparisons in interpersonal attraction of females toward males. *J Soc Psychol.* 1979;108:121–122.
6. Furnham A, Baguma P. Cross-cultural differences in the evaluation of male and female body shapes. *Int J Eat Disord.* 1994;15:81–89.
7. Olvera N, Suminski R, Power TG. Intergenerational perceptions of body image in hispanics: Role of BMI, gender and acculturation. *Obes Res.* 2005;13:1970–1979.
8. Sarwer D, Grossbart T, Didie ER. Beauty and society. *Semin Cutan Med Surg.* 2003;22:79–92.
9. McLellan B, McKelvie SJ. Effects of age and gender on perceived facial attractiveness. *Can J Behav Sci.* 1993;25: 135–142.
10. Leong SC, White PS. A comparison of aesthetic proportions between the healthy Caucasian nose and the aesthetic ideal. *J Plast Reconstr Aesthet Surg.* 2006;59:248–252.
11. Rohrich RJ, Adams WP Jr. The boxy nasal tip: Classification and management based on alar cartilage suturing techniques. *Plast Reconstr Surg.* 2001;107:1849–1863; discussion 1864–1868.
12. Rohrich RJ, Muzaffar AR. Primary rhinoplasty. In: Achauer BM, Eriksson E, Guyuron B, et al, eds. *Plastic Surgery: Indications, Operations, and Outcomes.* Philadelphia: Mosby; 2000: 247–263.
13. Rohrich RJ, Sheen J. Secondary rhinoplasty and nasal reconstruction. In: Grotting JC, ed. *Reoperative Aesthetic & Reconstructive Plastic Surgery.* St. Louis: Quality Medical; 1995: 401–510.
14. Staffel JG. *Basic Principles of Rhinoplasty.* San Antonio, Texas: University of Texas, Health Science Center at San Antonio; 1996:13.
15. Byrd HS. Rhinoplasty. *Selected Readings Plast Surg.* 2001;18: 34–38.
16. United Nations. Population Division. Department of Economic and Social Affairs. *World Population Prospects: The 2010 Revision: Classification of Countries by Major Areas and Region of the World.* New York: United Nations; 2010.
17. Cunningham MR. Measuring the physical in physical attractiveness: Quasi-experiments on the sociobiology of female facial beauty. *J Person Soc Psychol.* 1986;50:925–935.
18. Cunningham MR, Roberts AR, Barbee AP, et al. "Their ideals of beauty are, on the whole, the same as ours": Consistency and variability in the cross-cultural perception of female physical attractiveness. *J Person Soc Psychol.* 1995; 68:261–279.