PSYCHOSOCIAL IMPLICATIONS OF BLEPHAROPTOSIS AND DERMATOCHALASIS*

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ABSTRACT

Purpose: To investigate, for the first time, the psychosocial implications of blepharoptosis and dermatochalasis.

Methods: Two hundred ten individuals rated whole-face photographs of a series of patients on the basis of 11 different personal characteristics: intelligence, threat, friendliness, health, trustworthiness, hard work, mental illness, financial success, attractiveness, alcoholism, and happiness. Preoperative and postoperative photographs of both male and female patients with bilateral blepharoptosis and/or dematochalasis were used. The paired *t* test was used to compare preoperative and postoperative ratings on the 11 characteristics.

Results: The preoperative photographs were rated more negatively than the postoperative photographs ($P < .01 – P < .001$) on all 11 characteristics for both male and female patients by the 210 study subjects.

Conclusions: Members of society seem to view individuals with blepharoptosis and dermatochalasis negatively. These psychosocial attitudes may lead to unjust bias toward affected patients, and surgical correction likely provides benefits beyond improved visual function.

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INTRODUCTION

The functional visual deficits secondary to blepharoptosis have been well studied. Meyer and associates[1] quantified the amount of superior visual field loss observed with various degrees of ptosis by opacifying the superior portion of contact lenses to simulate different upper eyelid positions. Patipa[2] demonstrated and quantified the improvement in the superior visual field in primary and reading gaze after surgical correction of ptosis. Health-related quality-of-life issues associated with blepharoptosis have also been investigated. Battu and colleagues[3] used a questionnaire pertaining to vision-related activities and symptoms to study the effect of ptosis on patients' subjective perception of their visual function and quality of life prior to and following surgical correction. They found that postoperative patients perceived a significant improvement in their vision as well as their ability to perform tasks such as fine manual work, reading, and watching television. Using the same questionnaire with 100 different patients, Federici and coworkers[4] showed that the severity of the ptosis and the degree of perceived preoperative functional impairment correlated most strongly with the degree of perceived postoperative improvement. In both of these studies, patients reported improvement in self-image postoperatively as well.[3,4] While these studies have demonstrated the functional visual deficits and the health-related quality-of-life issues associated with blepharoptosis, we are not aware of any previous studies in which the psychosocial implications of blepharoptosis were examined. In the present study, we investigate, through the use of facial photographs and questionnaires, how members of society view individuals with blepharoptosis and dermatochalasis.

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METHODS

Four sets of 6 different whole-face color photographs were created. In each of the 4 sets, there was a male and female control (a 75-year-old white man and an 81-year-old white woman who did not have clinically significant blepharoptosis or dermatochalasis and who had never undergone eyelid surgery). In addition, there was a preoperative male (a man with clinically significant blepharoptosis and/or dermatochalasis prior to surgical correction), a different postoperative male (a different man who had undergone successful surgical correction of blepharoptosis and/or dermatochalasis), and a preoperative and a different postoperative female.

Four different men were used for the preoperative and postoperative male photographs; all were white and ranged in age from 55 to 75 years (mean, 68 years). One of the men underwent a bilateral upper eyelid blepharoplasty, one underwent a bilateral external aponeurotic ptosis repair with levator advancement, one underwent a bilateral upper eyelid blepharoplasty and external

aponeurotic ptosis repair with levator advancement (Fig 1), and one underwent a bilateral Fasanella-Servat procedure.[5] Likewise, 4 different women were used for the preoperative and postoperative female photographs; all were white and ranged in age from 68 to 85 years (mean, 74 years). One of the women underwent a bilateral external aponeurotic ptosis repair with levator advancement, 1 underwent a bilateral upper eyelid blepharoplasty and Fasanella-Servat procedure[5] (Fig 2), and 2 underwent bilateral Fasanella-Servat procedures.[5]

In all patients preoperatively, the eyelids were symmetrical and the margin reflex distance ranged from 0 to 1.0 mm; in all patients postoperatively, the eyelids were symmetrical and the margin reflex distance ranged from 2.5 to 4.0 mm. Each of the 8 surgical patients used in the study had a preoperative photograph in 1 set and a postoperative photograph in another set. All of the surgical procedures were performed by one of the authors (J.D.B). Thus, each study subject viewed photographs of 6 different patients (no study subject viewed the same patient's preoperative and postoperative photographs).

Study subjects were recruited in suburban shopping malls and received $2 for participating. The subjects were simply informed that they would participate in a study being conducted by Wright State University. The age and sex of each subject were recorded. Each subject was instructed to complete a questionnaire (designed by 3 of the authors [J.D.B., R.E.W., and D.G.B.]) according to their perceptions of each of the individuals in the set of photographs presented. The 6 photographs within each set were shuffled and presented to the subject 1 at a time in random order along with a questionnaire. In each questionnaire, the subjects were asked to rate the individual in the photograph on a scale of 1 to 5 on the following 11 personal characteristics:

1. intelligence (1 = not intelligent, 5 = very intelligent)
2. threat (1= very threatening, 5 = not threatening)
3. friendliness (1 = not friendly, 5 = very friendly)
4. health (1 = not healthy, 5 = very healthy)
5. trustworthiness (1 = not trustworthy, 5 = very trustworthy)

Some of the photographs from the papers and theses are not available on the Website but can be seen in the published version of the Transactions.

FIGURE 1

Seventy-year-old man with bilateral upper eyelid dermatochalasis and blepharoptosis who underwent bilateral upper eyelid blepharoplasty and external aponeurotic ptosis repair with levator advancement. Left, Preoperative photograph. Right, 3 months after surgery.

6. hard work (1 = not hardworking, 5 = very hardworking)
7. mental illness (1 = very likely to be mentally ill, 5 = not likely to be mentally ill)
8. financial success (1 = not financially successful, 5 = very financially successful)
9. attractiveness (1 = not attractive, 5 = very attractive)
10. alcoholism (1 = very likely to be an alcoholic, 5 = not likely to be an alcoholic)
11. happiness (1 = not happy, 5 = very happy)

The scale was designed so that the higher rating represented the more positive aspect of each characteristic. To determine if there was a difference in the way preoperative versus postoperative photographs were judged, the paired *t* test was used for matched comparisons (ie, the mean rating of all 4 preoperative males versus the mean rating of all 4 postoperative males on each characteristic, the mean rating of all 4 preoperative females versus the mean rating of all 4 postoperative females on each characteristic, and the mean rating of all 8 [male and female] preoperative patients versus the mean rating of all 8 postoperative patients on each characteristic). For example, the mean rating of the 4 preoperative males for the characteristic "intelligence" was 2.03 (scale: 1= not intelligent, 5 = very intelligent), and the mean rating of the 4 postoperative males for "intelligence" was 2.81. The paired *t* test was then used to compare the mean ratings (2.03 versus 2.81) to determine if there was a statistically significant difference in the way that the preoperative versus postoperative photographs were judged, and the probability (*P*) was < .001 that the difference in the ratings (2.81 – 2.03 = 0.78) was due to chance. Such comparisons were made for each of the 11 characteristics for both male and female patients

In addition to analysis of the preoperative versus postoperative comparisons of the male and female patients for all subjects, comparisons were broken down for (1) male subjects only, (2) female subjects only, (3) subjects under 21 years of age, (4) subjects 21 to 40 years of age, and (5) subjects over 40 years of age. Significance level (alpha) was set at 0.01.

Some of the photographs from the papers and theses are not available on the Website but can be seen in the published version of the Transactions.

FIGURE 2

Sixty-nine-year-old woman with bilateral upper eyelid dermatochalasis and blepharoptosis who underwent a bilateral upper eyelid blepharoplasty and Fasanella-Servat procedure.[5] Left, Preoperative photograph. Right, 4 months after surgery.

RESULTS

The results are summarized in Tables I and II. The study included 210 subjects, and the data was collected between January and March 1998. The mean age of the subjects was 33.9 years (range, 17 to 76 years); 98 (47%) were male and 112 (53%) were female. For all subjects (n=210) and all patients, the postoperative photographs were rated more positively than the preoperative photographs on all 11 characteristics ($P < .001$ for all 11) (Table I). For all subjects (n=210) and male patients only, all 11 characteristics were rated more positively postoperatively ($P < .001$ for all 11), and for female patients only, all 11 characteristics were rated more positively postoperatively as well ($P < .001$ for 10, and $P < .01$ for 1). For male subjects (n=98), 10 of 11 characteristics for male patients and 9 of 11 characteristics for female patients were rated more positively postoperatively ($P < .001$ for 17, $P < .01$ for 2). For female subjects (n=112), all 11 characteristics for male patients and all 11 characteristics for female patients were rated more positively postoperatively ($P < .001$ for 18, $P < .01$ for 4). For subjects under 21 years old (n=76), 9 of 11 characteristics for male patients and 6 of 11 characteristics for female patients were rated more positively postoperatively ($P < .001$ for 10, $P < .01$ for 5). For subjects 21 to 40 years old (n=62), all 11 characteristics for male patients and 9 of 11 characteristics for female patients were rated more positively postoperatively ($P < .001$ for 16, $P < .01$ for 4). For subjects over 40 years old (n=72), 9 of 11 characteristics for male patients and 9 of 11 characteristics for female patients were rated more positively postoperatively ($P < .001$ for 13, $P < .01$ for 5) (Table II).

TABLE I: PREOPERATIVE VERSUS POSTOPERATIVE RATINGS OF PATIENTS WITH BLEPHAROPTOSIS AND/OR DERMATOCHALASIS ON 11 CHARACTERISTICS*

CHARACTERISTIC	MEAN RATING		RATING CHANGE	*P* VALUE†
	PREOP	POSTOP		
Friendliness	1.85	2.72	0.87	<.001
Alcoholism	2.40	3.26	0.86	<.001
Happiness	1.81	2.63	0.82	<.001
Health	2.06	2.84	0.78	<.001
Mental illness	2.47	3.21	0.74	<.001
Intelligence	2.24	2.87	0.63	<.001
Financial success	2.13	2.74	0.61	<.001
Hard work	2.48	3.06	0.58	<.001
Attractiveness	1.53	2.06	0.53	<.001
Threat	2.89	3.36	0.47	<.001
Trustworthiness	2.53	2.94	0.41	<.001

*Rating scale of 1 to 5. The scale was designed so that the higher rating represented the more positive aspect of each characteristic (eg, intelligence: 1= not intelligent, 5 = very intelligent; threat: 1 = not threatening, 5 = very threatening). 210 subjects completed questionnaires.
†The paired *t* test was used for matched comparisons (ie, mean preoperative rating versus mean postoperative rating).

DISCUSSION

While an old adage suggests that you can't judge a book by its cover, physical appearance, particularly of the face, eyes, and eyelids, can greatly influence one's impression of another individual.[6,7] Physiognomy is the determination of mental or moral character and qualities based on facial characteristics.[8] While most scientifically minded individuals would refute the argument that facial features correlate with personality traits, history is riddled with anecdotes of physiognomy put into practice. Aristotle devotes several chapters of his *Historia Animalium* to the study of facial appearance. On the subject of eyebrows, he declares, "Straight ones are a sign of soft disposition, those which bend in towards the nose, a sign of harshness, those which bend out towards the temples, of a mocking and dissimilating disposition." Concerning the eyelid canthi, he states, "If these are long, they are a sign of malicious disposition; if they have the part towards the nose fleshy, it is a sign of dishonesty."[9]

Pythagoras is reputed to have turned students away from his academy if he felt that their facial appearance was not suited to the study of mathematics.[6(p3)] The Bible, however, refutes the principle of physiognomy. In John 7:24, Jesus adminishes: "Judge not according to the appearance, but judge righteous judgment." Shakespeare also expressed his doubts about the validity of physiognomy when, in Act 1, Scene 4 of *Macbeth*, Duncan, the King of Scotland who had previously described the recently executed Thane of Cawdor as "deceit(ful)," proclaims:[10]

There's no art
To find the mind's construction in the face.
He was a gentleman on whom I built
An absolute trust.

The philosophy of physiognomy gained popularity in the 19th century. In 1831, Charles Darwin almost lost his passage on the ship *HMS Beagle* because of the captain's impression of Darwin's nose. In his autobiography, Darwin relates, "He [Captain Fitz-Roy] was an ardent disciple of Lavater [the Swiss physiognomist Johann Caspar Lavater, author of *Essays on Physiognomy* (1772)[12]], . . . and he doubted whether anyone with my nose could possess sufficient energy and determination for the voyage."[11] Oscar Wilde seems also to have been a proponent of physiognomy. In 1885, he said to a new acquaintance, the French writer André Gide: "I don't like your lips. They are straight like those of someone who has never lied. I

TABLE II: PREOPERATIVE VERSUS POSTOPERATIVE RATINGS OF MALE AND FEMALE PATIENTS WITH BLEPHAROPTOSIS AND/OR DERMATOCHALASIS ON 11 CHARACTERISTICS

PATIENTS	SUBJECTS (N)		RATING CHANGE (*P* VALUE)†			
	MALE (N=98)	FEMALE (N=112)	<21‡ (N=76)	21-40‡ (N=62)	>40‡ (N=72)	TOTAL (N=210)
MALE						
Intelligence	0.78 (<.001)	0.80 (<.001)	0.75 (<.001)	1.05 (<.001)	0.60 (<.001)	0.78 (<.001)
Threat	0.57 (<.001)	0.56 (<.001)	0.54 (<.01)	0.76 (<.001)	0.41 (.012)	0.56 (<.001)
Friendliness	0.88 (<.001)	0.88 (<.001)	0.73 (<.001)	1.15 (<.001)	0.81 (<.001)	0.88 (<.001)
Health	0.87 (<.001)	0.86 (<.001)	0.78 (<.001)	1.23 (<.001)	0.67 (<.001)	0.87 (<.001)
Trustworthiness	0.32 (.13)	0.52 (<.001)	0.39 (.02)	0.48 (<.01)	0.26 (.06)	0.38 (<.001)
Hard work	0.64 (<.001)	0.78 (<.001)	0.76 (<.001)	0.82 (<.001)	0.57 (<.01)	0.72 (<.001)
Mental illness	0.67 (<.001)	1.05 (<.001)	0.95 (<.001)	1.18 (<.001)	0.54 (<.01)	0.87 (<.001)
Financial success	0.57 (<.001)	0.75 (<.001)	0.69 (<.001)	0.81 (<.001)	0.53 (<.01)	0.67 (<.001)
Attractiveness	0.78 (<.001)	0.41 (<.01)	0.32 (.02)	0.97 (<.001)	0.54 (<.001)	0.58 (<.001)
Alcoholism	0.99 (<.001)	0.89 (<.001)	0.89 (<.001)	1.08 (<.001)	0.88 (<.001)	0.94 (<.001)
Happiness	0.81 (<.001)	0.83 (<.001)	0.63 (<.001)	1.14 (<.001)	0.74 (<.001)	0.82 (<.001)
FEMALE						
Intelligence	0.45 (<.01)	0.51 (<.001)	0.30 (.07)	0.76 (<.001)	0.44 (<.01)	0.48 (<.001)
Threat	0.22 (.15)	0.51 (<.01)	0.40 (.15)	0.45 (<.01)	0.28 (.013)	0.38 (<.01)
Friendliness	0.68 (<.001)	1.02 (<.001)	0.85 (<.001)	0.97 (<.001)	0.80 (<.001)	0.87 (<.001)
Health	0.69 (<.001)	0.71 (<.001)	0.56 (<.01)	0.82 (<.001)	0.73 (<.001)	0.69 (<.001)
Trustworthiness	0.39 (<.01)	0.49 (<.001)	0.49 (<.01)	0.35 (.012)	0.47 (<.01)	0.44 (<.001)
Hard work	0.31 (.04)	0.55 (<.001)	0.57 (<.01)	0.42 (.014)	0.29 (.10)	0.43 (<.001)
Mental illness	0.67 (<.001)	0.54 (<.01)	0.20 (.33)	0.90 (<.001)	0.78 (<.001)	0.60 (<.001)
Financial success	0.59 (<.001)	0.51 (<.001)	0.45 (.013)	0.53 (<.01)	0.65 (<.001)	0.54 (<.001)
Attractiveness	0.63 (<.001)	0.35 (<.01)	0.28 (.09)	0.44 (<.01)	0.74 (<.001)	0.49 (<.001)
Alcoholism	0.56 (<.001)	0.98 (<.001)	0.83 (<.001)	0.84 (<.001)	0.68 (<.001)	0.78 (<.001)
Happiness	0.77 (<.001)	0.88 (<.001)	0.53 (<.01)	1.04 (<.001)	0.98 (<.001)	0.83 (<.001)

*Rating scale of 1 to 5. The scale was designed so that the higher rating represented the more positive aspect of each characteristic (eg, intelligence: 1= not intelligent, 5 = very intelligent; threat: 1 = not threatening, 5 = very threatening).

†The paired *t* test was used for matched comparisons (ie, preoperative male versus postoperative male, preoperative female versus postoperative female). In all comparisons, the mean postoperative rating was higher than the mean preoperative rating.

‡Age of study subjects in years.

want to teach you how to lie, so your lips become beautiful and twisted. . . ."[13]

The psychosocial impact of readily apparent strabismus on affected adults has been well studied. Using a self-report questionnaire, Satterfield and associates[14] found evidence to suggest that the presence of strabismus was perceived by affected patients to have a negative impact on many aspects of their lives, including self-image, securing employment, interpersonal relationships, school, and work. In another study, Burke and colleagues[15] had 16 adult patients who had recently undergone corrective strabismus surgery complete a self-reporting repertory grid concerning 15 personality traits with respect to themselves prior to and following the surgery. The investigators found that the patients scored themselves to be significantly more positive relative to the 15 traits after versus before surgery, and that the patients felt that others viewed them to be more positive relative to the traits after surgery as well. Coats and coworkers[16] showed study respondents mock resumes with photographs of men and women with a digitally generated large-angle esotropia or exotropia and asked the respondents to rate the applicants on their perceived qualifications for a hypothetical job. They found that the presence of large-angle horizontal strabismus adversely affected perceived vocational qualifications for female applicants, but not for male applicants. In a study of similar design to the present study, Olitsky and associates[17] showed subjects a photograph of an orthotropic, esotropic, or exotropic individual, and asked the subjects to evaluate the person in the photograph with regard to 11 personality characteristics. When compared to the orthotropic photograph, the esotropic photograph was judged significantly more negatively with respect to intelligence, attentiveness, competency, humor, emotional stability, leadership ability, and communication and organizational skills, while the exotropic photograph was judged significantly more negatively only with regard to sincerity.

In addition to strabismus, the size of one's pupils may affect how others view that person. Hess[18] showed male subjects photographs of 2 different women and asked them to compare the women with respect to various traits.

The photographs were identical except that in one, the pupils were retouched to make them larger, and in the other, they were retouched to make them smaller. The women with the larger pupils were viewed to be more "warm" and "soft," whereas the same women with smaller pupils were viewed to be more "selfish" and "cold."

In the present study, as a whole, both the male and female photographs with uncorrected blepharoptosis and dermatochalasis were viewed significantly more negatively on all 11 of our measured characteristics than the same patients' postoperative photographs. Although small sample size precluded statistical analysis of preoperative versus postoperative ratings for each individual patient, each did show a higher mean postoperative rating on all 11 characteristics. While the mean postoperative ratings for all of the characteristics were higher within each of the analyzed subsets of study subjects, some characteristics did not show statistical improvement in certain subsets. It is possible that some of these comparisons would have been statistically significant if more subjects had been recruited. Worth noting is the subset of subjects under 21 years of age. This group found only 15 of 22 comparisons (11 characteristics for both male and female patients) to be significantly different (compared to the subset of female subjects, in which all 22 comparisons were found to be significantly different). Also, they were the only age-group not to rank the male or female patients significantly more attractive postoperatively. Perhaps the results for the subjects under 21 years of age would have been different if the patients in the photographs had been closer to those subjects' ages. Also worth noting is that in the 55 comparisons for the male patients (11 characteristics and five subsets of subjects), only 5 did not show a significant improvement postoperatively; however, with the female patients, 11 of 55 failed to show a significant improvement postoperatively. This difference may be suggestive of a slightly more negative bias toward men (as opposed to women) with blepharoptosis.

There are some limitations to our study. The patients in the photographs (aged 55 to 85 years) are representative of an older population. Thus, the generalizability of the results to younger patients with ptosis is uncertain. We relied on paid volunteers as our study subjects, we did not determine the percentage of those approached who participated in the study, and the subjects were all recruited from similar suburban shopping malls (which may represent a skewed population). Our questionnaire was designed by 3 of the authors (J.D.B., R.E.W., and D.G.B.), was not based on any previous studies, and therefore does not represent an instrument of proven reliability and validity. The 11 study characteristics were chosen in an attempt to create a diverse yet succinct list of personal traits of interest to be studied. In order to mask the purpose of the study, subjects did not view the same patient's preoperative and postoperative photographs, and therefore preoperative and postoperative ratings of the same patient were performed by different study subjects. The purpose of the "control" male and female photographs was to further mask the intent of the study, and therefore they were not used in the statistical comparisons. In addition, the degree of ptosis required to elicit statistically significant results was not determined.

The indications for upper eyelid surgery have traditionally been based on functional deficits.[19-21] Previous studies have demonstrated that patients perceive an improvement in their quality of life following ptosis surgery.[3,4] Intuitively, this improvement may be attributed to the enlarged visual field resulting from proper surgery. However, the notion that the perceived improvement in quality of life may be due to as yet unexamined psychological factors produced by surgical correction of blepharoptosis has been suggested.[22] The results of the present study give credence to this concept. How we are viewed and treated by others is a large determinant of our perceived quality of life. While few people would intentionally practice physiognomy, the results of the present study indicate that most people, albeit unconsciously and perhaps innocently, are biased by certain facial features, namely, the presence of blepharoptosis and dermatochalasis. Thus, it is very likely that these biases affect the social and professional functioning of afflicted patients. Therefore, beyond the improvement in visual function, an equally or possibly even more significant outcome of surgical correction could be the reversal of the negative social implications associated with these eyelid conditions. This is a very important consideration for physicians and third-party insurers who strive to improve the functional, social, and psychological well-being of patients.

REFERENCES

1. Meyer DR, Linberg JV, Powell SR, et al. Quantitating the superior visual field loss associated with ptosis. *Arch Ophthalmol* 1989;107:840-843.
2. Patipa M. Visual field loss in primary gaze and reading gaze due to acquired blepharoptosis and visual field improvement following ptosis surgery. *Arch Ophthalmol* 1992;110:63-67.
3. Battu VK, Meyer DR, Wobig JL. Improvement in subjective visual function and quality of life outcome measures after blepharoptosis surgery. *Am J Ophthalmol* 1996;121:677-686.
4. Federici TJ, Meyer DR, Lininger LL. Correlation of the vision-related functional impairment associated with blepharoptosis and the impact of blepharoptosis surgery. *Ophthalmology* 1999;106:1705-1712.
5. Fasanella RM, Servat J. Levator resection for minimal ptosis: Another simplified operation. *Arch Ophthalmol* 1961;65:493-496.
6. Zebrowitz LA. *Reading Faces*. Boulder, Colo: Westview Press; 1998.
7. Liggett J. *The Human Face*. New York: Stein & Day; 1974.

8. Dorland WA. *Dorland's Illustrated Medical Dictionary*. 26th ed. Philadelphia: Saunders; 1981;1016.
9. Aristotle. Historia Animalium. Vol. 1. Cambridge, Mass: Harvard University Press; 1965;39-40.
10. Shakespeare W. The Tragedy of Macbeth. Act I, Scene IV. In: Wells S, Taylor G, eds. *William Shakespeare. The Complete Works*. Oxford, England: Oxford University Press; 1988;979.
11. Darwin F. *The Autobiography of Charles Darwin and Selected Letters*. New York: Dover Publications; 1958;27.
12. Lavater JC. *Essays on Physiognomy*. 18th ed. London: Ward, Lock, & Co; 1772
13. Belford B. Oscar Wild—A Certain Genius. New York: Random House; 2000;182.
14. Satterfield D, Keltner JL, Morrison TL. Psychosocial aspects of strabismus study. *Arch Ophthalmol* 1993;111:1100-1105.
15. Burke JP, Leach CM, Davis H. Psychosocial implications of strabismus surgery in adults. *J Pediatr Ophthalmol Strabismus* 1997;34:159-164.
16. Coats DK, Paysse EA, Towler AJ, et al. Impact of large angle horizontal strabismus on ability to obtain employment. *Ophthalmology* 2000;107:402-405.
17. Olitsky SE, Sudesh S, Graziano A, et al. The negative psychosocial impact of strabismus in adults. *J AAPOS* 1999;3:209-211.
18. Hess EH. The role of pupil size in communication. *Scientific American* 1975;233:110-119.
19. Bartley GB, Bullock JD, Reifler DM. Functional indications for upper and lower eyelid blepharoplasty. *Ophthalmology* 1995;102:693-695.
20. Meyer DR. Functional eyelid surgery. *Ophthalmic Plast Reconstr Surg* 1997;13:77-80.
21. Anderson RL, Holds JB. Does anyone know how to differentiate a "functional" defect from a cosmetic one? *Arch Ophthalmol* 1990;108:1685-1686.
22. Fante RG, Bartley GB. Rational (or rationing?) healthcare. *Ophthalmology* 1999;106:1649-1650.

DISCUSSION

DR BARTLEY R. FRUEH. I thank the authors for providing me with their completed manuscript in a timely fashion. It is a fun paper to read. They have looked at a previously unstudied aspect of the common conditions, ptosis and dermatochalasis, approaching them from the viewpoint of how the lay public interprets the facies of people with these conditions in terms of intelligence, threat, friendliness, health, trustworthiness, hard-work, mental illness, financial success, attractiveness, alcoholism, and happiness. This is a polygenous grouping of traits found in no other study. I suspect the authors drained a few pints in a local establishment to come up with these 11 largely unconnected characteristics. However, the disparate nature of these categories adds value, interest, and charm to the study.

The study is well designed and executed. Since no subject sees the pre and postoperative photo of the same patient, the subject avoids the bias that might create. Their paired analysis is appropriate for the study. A minor criticism is that it would have been better to report the actual *P* value when it was between 0.01 and 0.001 rather than reporting as <0.01. I am sure they have these numbers and it is a reporting style.

It would be reassuring to know that the pre and postoperative photographs were taken under identical conditions, including lighting, photographic exposure, hairstyle, spectacles, make-up, facial expression, and background. If patients were to look more glamorous in the postoperative photos due to any of these factors, that might become the predominate factor shaping the observer's opinion, instead of the effects of the surgery.

It is appropriate to question whether ptosis and dermatochalasis should have been combined for this study. Each could have been studied separately. The study provides no data to show whether the perception of these 2 conditions might differ.

Although control photographs of people without ptosis or dermatochalasis were used in the presentation of photos to subjects, the opinions on the controls were not utilized in the data analysis. There are 3 ways these data could be analyzed to yield new information. They could be compared with the ratings on the post-operative patients. If there were no difference, this would be evidence that the surgical procedures did restore these patients to normality. Secondly, they could be used in the analysis to adjust for any tendencies for the subjects who utilize less than the full 1-5 scale. For example, some might use only 2-4, others 1-3, and others 3-5. Thirdly, one could randomly allocate control ratings into 2 groups repeatedly, the so-called Monte Carlo simulation, and test for any differences as a way to demonstrate lack of bias in ratings, time of testing subjects, and location of testing.

Despite these queries, this is an excellent study that demonstrates that the public's perception of the facies of patients with ptosis and dermatochalasis is negative with respect to a number of important characteristics. So not only do ptosis and dermatochalasis impair the superior field of vision, the only element insurance companies care about, they probably negatively impact the patients navigations in our society. Surgical correction may well improve not only the patient's visual restriction and self-image, but their ability to interact with others.

[Editor's note] DR ROBERT D. YEE wondered if the questions asked brought attention to specific and selected characteristics and therefore introduced a bias into the study.

DR JOHN D. BULLOCK. I thank Drs Frueh and Yee for their insightful comments. Let me first address Dr Yee's question of bias due to the possible drawing of attention (presumably to the ptosis) by the questionnaire. I am not sure how else we could have done our study other than how we did it. One obviously has to show the group of subjects some patients who are pre-operative ptosis surgery

and other who are post-operative ptosis surgery. One obviously has to have photographs of these patients, and have a questionnaire to elicit the information that you want to obtain. I guess the only bias would come if the subjects realized that there were 2 patients in the group of 6 photographs who had ptosis and they somehow sensed that this was the purpose of the study. Short of that, I think we did our study in an as unbiased way as possible, under the circumstances. I do appreciate Dr Yee's comments.

I would now like to address Dr Frueh's comments and state before doing so that we really appreciate his thoughtful consideration of our paper. Firstly, he commented on the diverse group of traits that we studied. Our traits are diverse; we tried to "cover the waterfront" in terms of different aspects of one's personality. It should be noted that our co-investigator, Dr David G. Bienfeld, is the Vice Chair of the Department of Psychiatry at Wright State University School of Medicine; thus, we did have an excellent professional to help in selecting these characteristics. In the paper I cited by Burke, et al concerning adult patients who had recently undergone corrective strabismus surgery, these authors used a grid containing 15 different diverse personality traits, not unlike ours. Another minor criticism which Dr Frueh suggests is the reporting of the actual *t* values between .01 and .001. In my experience with statistics, it is most unusual to report statistics in the way suggested by Dr Frueh. Typically one does report them as we did ie., "less than .01" and "less than .001." It should also be noted that another of our co-investigators, Ronald J. Markert, PhD is a highly experienced biostatistician. Dr Frueh next commented about the pre- and post-operative photographs being taken under identical conditions. In a retrospective clinical study, which ours was, this, of course, would be impossible. However, we did take the photographs under as closely similiar conditions as practical in our office setting. There was certainly no attempt to make the post-operative patients look more "glamorous" than the pre-operative patients and, as a matter of fact, the group of photographs that we used were actually selected to be as similiar as possible pre-operatively and post-operatively, other than for the presence or absence of ptosis. However, there were minor differences in the lighting, facial appearance, hair, and clothing between the pre and post-operative photographs as we indicated in our paper. He then questions whether or not the blepharoptosis should have been combined with dermatochalasis in our study. In fact, 7 of these 8 patients had blepharoptosis with or without dermatochalasis, and only 1 had dermatochalasis without blepharoptosis. Therefore, we are studying the effect of the abnormal appearance of the upper eyelids and did not study the public's perception of pure ptosis or pure dermatochalasis. He also questions the statistical use of the control photographs and the fact that their scores were not utilized in the data analysis. There are many ways to analyze data in any given study and our analysis was selected for simplicity and ease of analysis. In fact, our data showed that, as groups, the post-operative patients were rated much more favorably that the pre-operative patients to a very high statistically significant level. I again thank Dr Frueh for his thoughtful and thorough analysis of our paper.