

The perceived personality traits of adults with digitally induced large angle strabismus and the impact of its correction

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Purpose: To ascertain the effect of digitally induced large angle strabismus and its correction on social bias against strabismic adults. **Subjects and Methods:** This prospective, observational study included 10 orthotropic subjects whose face photographs were digitally altered to produce esotropia, exotropia, and hypertropia. Three batches of non-medical professionals, each consisting of 14 subjects, adjudged personality traits of the altered face photographs on a 10-item questionnaire. The same evaluators effected the appraisal of the orthotropic photographs. The personality score of the strabismic photograph of a subject was compared with its own orthotropic photograph. **Results:** The 10 subjects whose photographs were digitally modified were of the same age (21 years) and had equal gender distribution. The evaluation of the photographs was performed by 42 evaluators aged 38.3 ± 14.9 years, of whom 21 were males. Different personality traits were rated negatively in the strabismic photographs. The statistically significant negative impact was apparent on more number of personality traits for esotropia (7 out of 10) as compared to exotropia (4 out of 10) or hypertropia (3 out of 10). Rating of the strabismic photographs was significantly lower by female evaluators ($P = 0.006$). However, there was no difference whether the subject evaluating the photograph of the strabismic individual was of the same gender or the opposite gender. Internal consistency of the questionnaire was excellent (Cronbach's Alpha = 0.81). **Conclusion:** There was a significant negative impact of strabismus on the perceived personality traits of the digitally altered face photographs of the adults when compared to their orthotropic photograph.

Key words: Adult strabismus, personality, psychosocial impact, quality of life, squint

Although the primary goal of a strabismus surgery is to align the visual axes in the interest of binocularity and stereopsis even when the prognosis for binocularity and stereopsis is poor, a surgery may be indicated to reverse the psychosocial and emotional consequences of strabismus viz. poor self-image, negative social bias, ridicule at work place, ostracization, depression, anger and outrage, increased social anxiety, poor interpersonal relationship, inhibition, and poor job opportunities.^[1-8]

From the perspectives of the patients with strabismus, it is important to know how people perceive them with their strabismus and how the correction of strabismus could modify other's perception of them; Olitsky *et al.*^[8] had partly studied this by evaluating the psychosocial effect on people who interact with strabismic individuals. They used digitally altered face photographs and noted the responses to esotropia, exotropia, and orthotropia. However, there was no attempt to evaluate the effects of straightening of the eyes and bias in the gender-specific effect of that perception. Another major limitation of the study was that the strabismic photograph and the orthotropic photograph of the same subject were evaluated by different people.

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In the present study, we present the data on how the "educated" people from Indian cities living in the urban area perceive the personality traits of a digitally induced strabismus in their fellow citizen, and how their perspectives change once the strabismus is corrected.

Subjects and Methods

This prospective study included 10 orthotropic subjects aged 21 years whose face photographs were taken looking straight ahead, to the right, to the left, and up. These photographs were then digitally combined and altered to produce three pictures of the same individual with esotropia, exotropia, and hyperdeviation [Fig. 1]. For standardization, the squint was always induced in the right eye and the amount of horizontal deviation and vertical deviation was kept constant (50° and 20° , respectively). Only the subjects who did not have any cosmetic blemish on the face were included in the study.

Three batches, each consisting of 14 well-educated (post-graduate level or more) professionals from non-medical field were selected to judge the personality traits of digitally altered photographs. These "evaluators" were first explained the nature of the study and given a 10-item questionnaire [Table 1].

An instructor first explained the nature of the study to the evaluators. The evaluators were first shown Fig. 1a and asked to mark their responses in the questionnaire. This was followed by projection of Fig. 1d and marking of the responses of the evaluators again. The instructor then checked for the errors in the responses and provided reinforcing explanations to the evaluators.

Following this, the evaluators were asked to repeat the same exercise for the digitally altered photographs of 10 previously selected subjects, marking their responses to the strabismic photograph first followed by orthotropic photographs of the same subject.

For one batch, only one pair of photographs (photograph with strabismus and photograph with orthotropia) of a subject was used, i.e., one batch that responded to esodeviation in one individual was not shown the same individual with exodeviation or hyperdeviation. Care was taken to include equal number of male and female evaluators in each batch who were shown equal number of photographs of male and female subjects for evaluation, with an equal representation of the type of ocular deviations (exo/eso/hyper).

The responses of the evaluators were compiled using Microsoft Excel (version 2000) datasheet. To compare the paired data (comparison of subjects with strabismus and without strabismus), a Paired *t*-test was used. Two-tailed *t*-test was used to compare the unpaired data (comparison of esodeviation with exodeviation or hyperdeviation and comparison of marking for female subjects with male subjects and comparison of data from female evaluators with male evaluators). The internal consistency of the questionnaire was determined with Cronbach's Alpha using NCSS (Number cruncher statistical software, 2007, Kaysville, Utah, USA). *P* < 0.05 was considered significant.

Results

Out of 10 subjects whose photographs were digitally modified to induce strabismus, five were males and five females with a

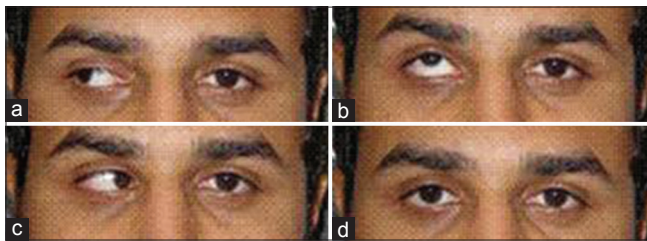


Figure 1: Digitally altered photograph of the orthotropic subject (d) showing exotropia (a), hypertropia (b) and esotropia (c)

mean age of 21 years (standard deviation 0). The evaluation of the photographs was performed by 42 subjects, of whom 21 were males, aged 38.3 ± 14.9 years (range, 17-78 years). The total score of strabismic photographs was less than that of orthotropic individuals [Table 2]. Different personality traits were rated significantly poor in patients with strabismus when compared to their orthotropic photographs. More number of personality traits (7 out of 10) was rated negatively for patients with esotropia as compared to a patient with exotropia (4 out of 10) and a hypertropia (3 out of 10) [Fig 2]. In patients with exotropia, the total score was lower than that in patients with hypertropia and esotropia, which was statistically not significant. The female evaluators rated strabismic photographs significantly lower compared to male evaluators (*P* = 0.006). However, there was no difference in the total scores depending on whether the subject who evaluated the photograph of the strabismic individual was of the same gender or the opposite gender. Cronbach's Alpha for the questionnaire was 0.81 (excellent internal validity).

Table 1: Ten item personality traits questionnaire

Name of the evaluator: Sex: Education:	Can be left anonymous Occupation:	Age:
Rating of the personality trait: 1: Poor, 2: Fair, 3: Good, 4: Very Good, 5: Excellent		
Personality traits	Rating for photograph with squint	Rating for photograph without squint
Sincerity of the person		
Dependability of the person		
Honesty of the person		
Emotional stability of the person		
Funny look in the face of the person		
Intelligence of the person		
Attentiveness of the person		
Communication skills of the person		
Leadership quality of the person		
Competency of the person		

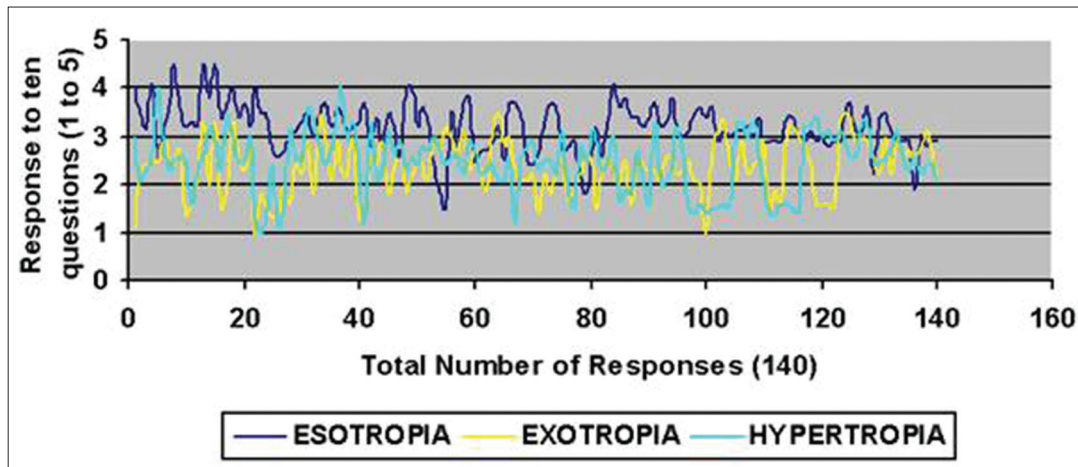


Figure 2: Comparison of mean total score (1-5) of personality traits for different types of ocular deviations

Table 2: Individual's mean scoring of the personality traits in strabismic photographs versus orthotropic photographs (standard deviation in parenthesis)

Personality traits (n=140)	Esotropia	Hypertropia	Exotropia	Overall strabismus	Orthotropia
Sincerity	2.3 (0.9)*	2.5 (0.9)*	2.2 (0.9)*	2.3 (0.9)	3.2 (0.9)
Dependability	2.4 (0.8)	2.5 (0.8)*	2.3 (0.9)	2.4 (0.8)*	3.1 (0.8)
Honesty	2.6 (1)*	2.6 (0.9)	2.5 (0.9)	2.6 (0.9)	3.2 (0.8)
Emotional stability	2.3 (0.9)*	2.5 (0.9)	2.5 (0.9)	2.4 (0.9)	3.2 (0.9)
Funny look	2.3 (1.1)*	2.4 (1.2)	2.3 (1.1)*	2.3 (1.2)*	3.3 (1.2)
Intelligence	2.5 (0.8)	2.6 (0.9)	2.6 (1)	2.5 (0.9)	3.2 (0.8)
Attentiveness	2.3 (0.8)*	2.5 (0.9)	2.4 (0.9)	2.4 (0.9)	3.2 (0.8)
Communication skills	2.3 (0.9)*	2.5 (1)	2.3 (0.9)*	2.4 (0.9)	3.2 (0.9)
Leadership quality	2.2 (1)*	2.3 (1)	2.2 (0.9)*	2.2 (1)*	3.1 (1)
Competency	2.4 (0.9)	2.5 (0.8)*	2.4 (0.9)	2.4 (0.9)	3.1 (0.8)
Total score	2.3 (0.9)*	2.5 (1)	2.4 (0.9)	2.4 (0.9)	3.2 (0.7)

*indicate statistically significant difference

Discussion

“What others would think about my personality/appearance?” and “How it will improve after the correction?” are important questions that decide whether an adult patient would seek a surgical correction or not. Till date, there is no medical literature on this issue from India. In the present study, we found that strabismus leads to significant negative perception by others, which tends to improve after correction. The female evaluators adjudged a strabismic patient more negatively than male evaluators, and this may have important implication for an aspiring male with strabismus searching for a bride or for a job in a company that has a female supervisor.

We found that the patients with esotropia were most negatively affected. This is in contrast to what Olitschy *et al.*,^[8] have published, where the total score was lowest for the exotropic photographs followed by hypertropic photographs and esotropic photographs. This may be a reflection natural bias of Indian evaluators and/or because of the difference in our methodology.

In a previous study,^[8] different individuals evaluated digitally induced strabismic photograph and orthotropic photograph of the same subject and the mean score of orthotropic photographs were compared with that of strabismic photographs to draw the conclusions. Our study scores in methodology as we have the same individual who evaluated the strabismic photograph and compared it with the orthotropic photograph of the same subjects, thereby eliminating a major confounder wherein an individual evaluator's bias for specific facial features of the subject were neutralized. Also, in our study, we had carefully included the same number of photographs of males and females and had an equal distribution of male and female evaluators removing any gender bias in scoring.

To draw conclusions, we relied on the total number of personality traits that were statistically significantly negatively affected for an individual rather than comparing the overall mean scores of strabismic photographs with non-strabismic photographs, which can be misleading due to a complete

disregard of the other facial factors resulting in negative impact.

Since female evaluators scored strabismic photographs lower than male evaluators, any study that has an unequal distribution of male and female evaluators would have different conclusion than ours.

In real life, apart from the type and angle of the strabismus, the judgment of the personality traits of an individual depends on other facial features viz. skin color, the interpupillary distance, etc. and non-facial features. However, in a controlled situation, a true comparison can only be done if the investigators have compared the scores of strabismic photograph and the orthotropic photograph evaluated by the same individual.

The questionnaire that we used had a very good internal validity and was exactly same as used in the previous study.^[8] However, in modern times one more and significantly important question about the “datability” of an individual with strabismus could have been added in the questionnaire.

In conclusion, there was a significant negative impact of strabismus on the personality traits. Further studies are required to assess the effect of the angle of the strabismus and impact of other facial features on the personality traits of strabismic individuals.

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