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Statistical analysis of stereoacuity in ophthalmology research

Dear Editor,

We read the interesting article entitled: "Stereoacuity after photorefractive keratectomy in myopia" by Zarei-Ghanavati et al.[1] As we already published,[2] data from stereopsis tests may need special care for analysis. By nature, the results of stereoacuity tests follow a geometrical sequence by multiplying at a ratio. For example, if we have 120 s of arc of stereoacuity in a subject and 480 in another, it means that the result at the second person is 4 *times* worse than the first one. This is different with measurements that follow an arithmetic sequence like ocular axial length in which a difference of length of 23 and 20 mm means the first number is the second number *plus* 3 mm. The functional consequence from a statistical standpoint would be that distribution of actual data of a geometrical sequence is expected to be highly skewed, although with regard to the central limit theorem, the distribution of the sample could be near normal enough to pass a normality test.[3] To work on data with geometric sequence properties, the skewness problem could easily be overcome by converting the data to the logarithm of them. A logarithm of the data with geometric sequence will be an arithmetic sequence, much easier to perform mathematical and statistical evaluation on. This phenomenon is well known and widely accepted in evaluation and analyzing the visual acuity data[4] from the 19th century.

For better statistical efficiency, we suggest to convert stereoacuity seconds of arc values to logarithm of second of arc and check the distribution plots.

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