

Eyetemis
analysis
tool

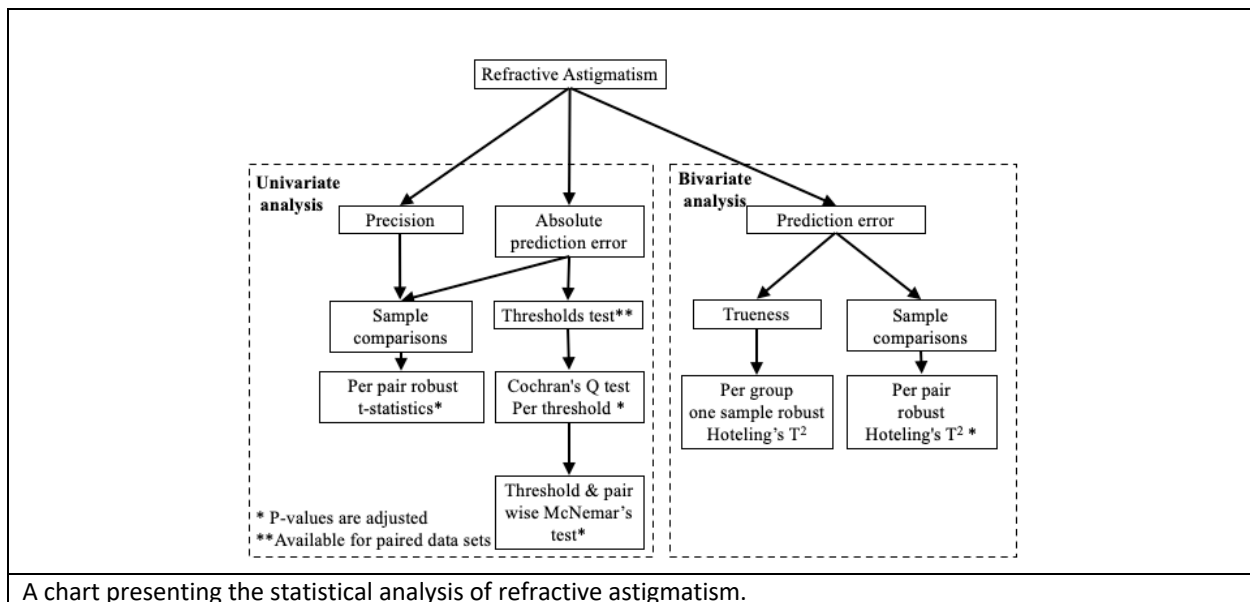


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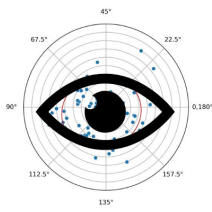
Frequently Asked Questions

How do you perform astigmatism analysis?

This tool addresses accuracy using ISO standards as being composed of two concepts, trueness and precision. It uses the robust t -test (described by Wilcox et al.) and the robust Hotelling T^2 test for univariate and bivariate analysis respectively. In these tests, the data in the distribution tails are trimmed to reduce the effect of outliers, and the standard deviation estimation is modified to account for the trimming. P -values are estimated using the Bootstrap, to account for the potentially non-normal distributions. Trueness is evaluated by comparing the centroid RA-PEs individually against zero and against each other by applying Robust Hotelling's T^2 tests. Precision indicates the proximity between observations, it is evaluated by comparing the trimmed-mean values of the distances between the RA-PEs and the centroid RA-PE for each method by applying the robust t -test. Accuracy is evaluated by comparing the trimmed-mean values of the RA-PE magnitudes by applying the robust t -test as well. The RA-PE magnitudes are also analyzed by comparing different thresholds. The graphical representation of the DAPs and the convex polygons are generated by the method described by Holladay et al.

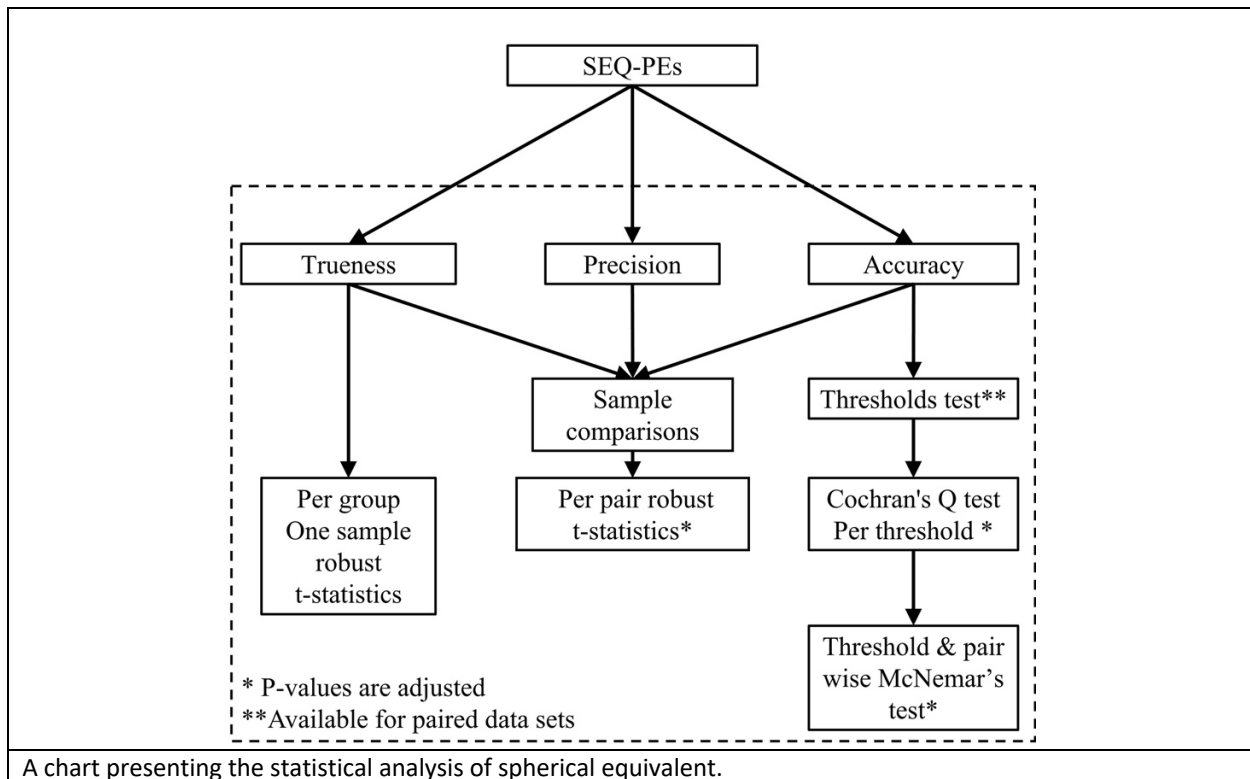


A chart presenting the statistical analysis of refractive astigmatism.



How do you perform spherical equivalent analysis?

The analysis examines three aspects, trueness precision and accuracy. To compare the distance of the measurements errors to zero (Trueness), the trimmed mean of the SEQ-PE are compared (per group) to zero using the one-sample robust t-test and are also compared to each other using the robust two-sample t-test. To compare the spread of the data (precision) of two or more groups, the trimmed mean values of the distances between the SEQ-PEs and the trimmed mean of the SEQ-PE are compared for every two groups using the robust two-samples-test. To compare the accuracy of two or more groups, the trimmed mean of absolute SEQ-PE are compared between each two groups using the robust two-sample-test. In addition, we compare the percentage of eyes within a certain range of SEQ-PE (thresholds). We use Cochran's Q test to identify significant differences within each threshold. For thresholds with a significant difference detected by the Cochran's Q test, subsequent pairwise comparisons are performed using the McNemar test.



A chart presenting the statistical analysis of spherical equivalent.