Comparison of subjective refraction findings with Dyop® acuity chart and LogMAR E chart

SUM R, Woo GC
School of Optometry, The Hong Kong Polytechnic University

PURPOSE
Dyop® (Dynamic Optotype) is a rotating and segmented visual stimulus which utilizes the photoreceptor pixel perception to measure visual acuity. The acuity endpoint is determined by the minimum stimulus area which the Dyop® segment motion could be perceived. The visual acuity measured by Dyop® was found comparable to the LogMAR E chart.¹

The aim of this study is to evaluate the agreement of refractive error measurement between Dyop® and LogMAR E chart in adults.

METHOD
Subjects with visual acuity better than 6/12 (20/40) were recruited in the clinic of the School of Optometry, The Hong Kong Polytechnic University in May 2017. The subjective refraction in both eyes was measured with a 3-meter LogMAR E chart and a Dyop® acuity chart displayed on a monitor placed at 6 meters. Duration of testing with each method was recorded. The differences in spherical equivalent (SE) and cylinder between the two charts were assessed using the Bland-Altman plot and 95% limits of agreement (95% LoA).

RESULTS
Forty subjects aged 45.3 ± 12.6 years were recruited in this study. The mean LogMAR visual acuity was -0.04 ± 0.04. Thibos’s notions (M, J0 and J45) were used to represent power vectors.² There was no significant mean difference of M, J0 and J45 measured between the two charts (p > 0.05). The correlations between the difference of measurements, the mean of M (p = 0.97), J0 (p = 0.386) and J45 (p = 0.225) were not significant, indicating no proportional bias between the two measurements. The measurement with Dyop® (332 ± 115 seconds) was slightly faster than with LogMAR E chart (356 ± 111 seconds) (p < 0.05).

CONCLUSION
The subjective refraction findings obtained with the use of the dynamic optotype was comparable to the traditional LogMAR chart. Dyop® was found to be an efficient tool in determining subjective refraction.

REFERENCE