

Assessing the influence of stimulus size on defect detectability in the central visual field

Luke Chong¹, Gary Lee², Collins Opoku-Baah², Buck Cunningham², Thomas Callan², John Flanagan³

¹School of Medicine (Optometry), Deakin University, Geelong, VIC, Australia

²Carl Zeiss Meditec, Inc., Dublin, CA, USA

³Herbert Wertheim School of Optometry and Vision Science, University of California Berkeley, Berkeley, CA, USA



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PURPOSE

- It has been previously demonstrated that a Goldmann size V visual field stimulus (1.72° diameter) was comparable to size III (0.43° diameter) when flagging 5% limit defects with the 24-2 test pattern in early glaucoma, whilst increasing the clinically-useful dynamic range and improving repeatability [1].
- This ongoing, prospective clinical study aims to build upon this previous work by comparing the diagnostic utility between size III and V stimuli with the 10-2 test pattern on a sample of participants with glaucoma.

METHODS

- Visual fields (VF) were acquired using a HFA3 Model 840 (ZEISS, Dublin, CA) perimeter over two visits for size III 10-2 Full Threshold (FT) and size V 10-2 FT strategies.
- 30 glaucomatous eyes were included in the study (size III 10-2 Mean Deviation (MD): mean = -7.80 dB; standard deviation (SD) = 7.65 dB; range = -29.18 to 1.16 dB).
- Topographic plots (Figure 1) were used to investigate the total number of flagged locations at the P<5% level for both total deviation (TD) and pattern deviation (PD) across the central 10 degrees of the VF. We also investigated the correlation and agreement of the number of times each location was flagged as defective between size III and V using scatterplots and Bland-Altman plots respectively (Figure 3).

CONCLUSIONS

Results from this preliminary study suggest that the diagnostic utility of size V is comparable to that of size III when detecting glaucomatous VF defects within the central 10 degrees of the VF.

REFERENCES

[1] Flanagan et al. IOVS 2016; 57(12)

Email: luke.chong@deakin.edu.au

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RESULTS

- Bland-Altman analyses revealed that there was good agreement between size III and V Full Threshold 10-2 test strategies with respect to the total number of flagged points at the P<5% level at each location for both TD (mean difference = -0.09, SD = 2.06) and PD (mean difference = 0.29, SD = 2.31).
- There was a strong correlation observed between III and V for both TD ($r^2 = 0.85$) and PD ($r^2 = 0.85$).
- There was no significant difference between size III and V for total number of flagged locations at the P<5% level for both TD ($p = 0.72$, paired t-test) and PD ($p = 0.13$, paired t-test).

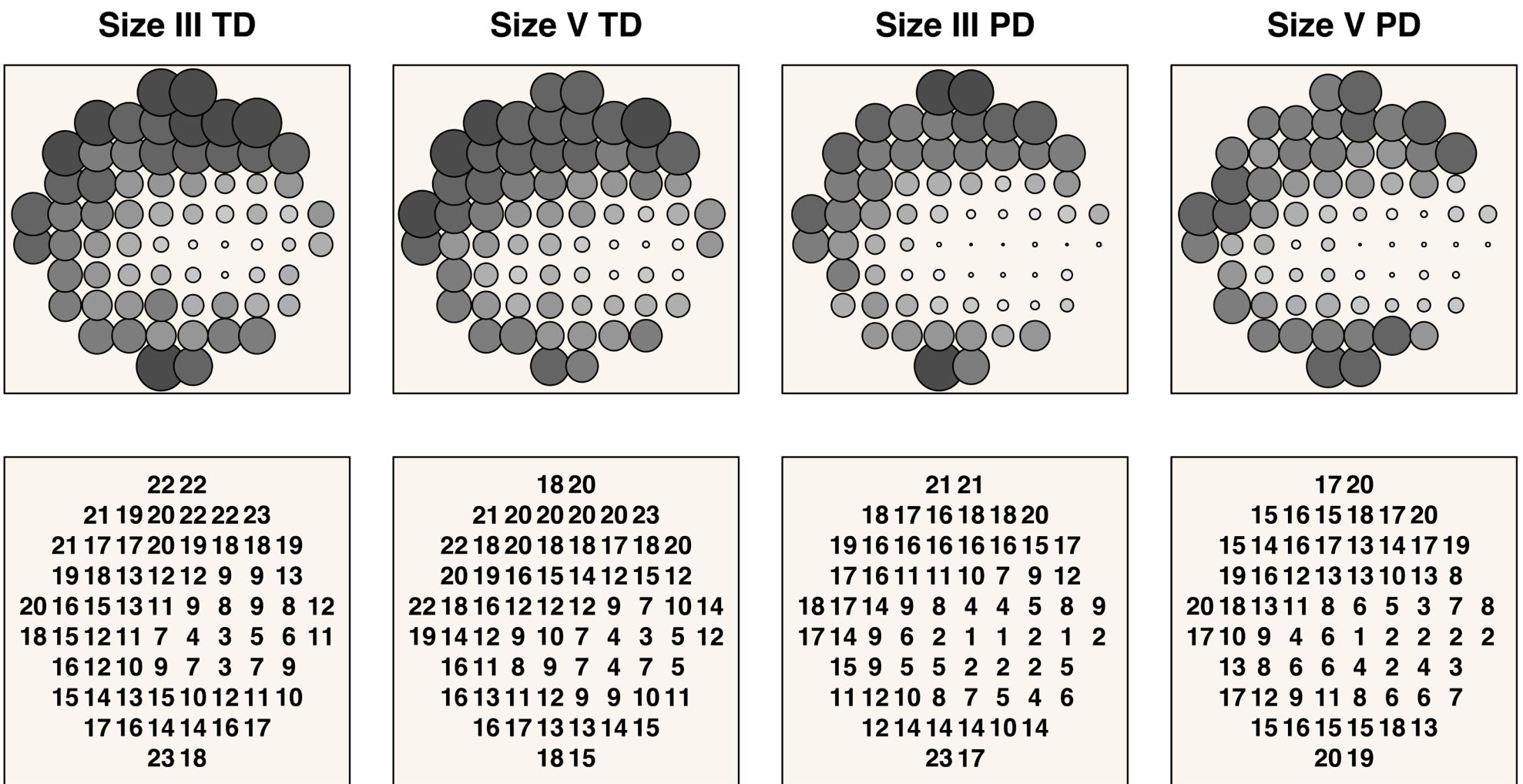


Figure 1 Topographic plots illustrating the total number of TD and PD flagged locations at the P<5% level across all 30 glaucomatous eyes for Goldmann sizes III and V. The top row provides a visual illustration, where larger and darker circles indicate more flagged locations. The bottom row provides the corresponding numerical values.

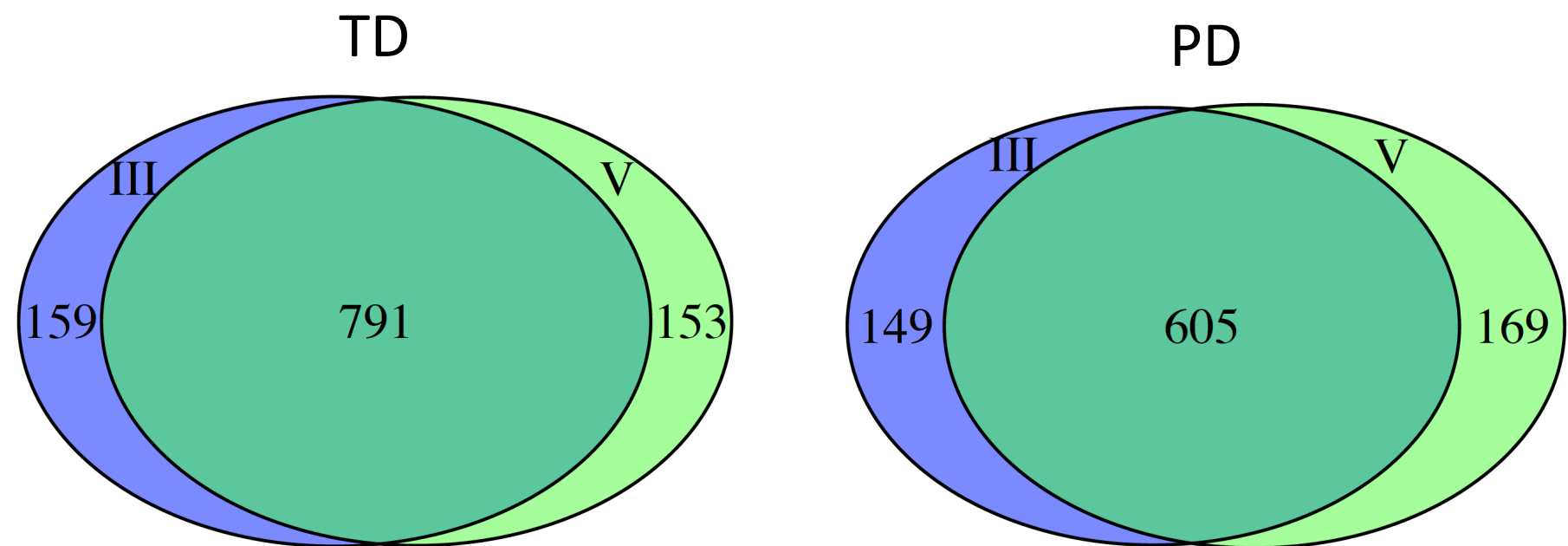


Figure 2 Venn diagrams illustrating similarity of locations flagged at the P<5% level for TD (left) and PD (right)

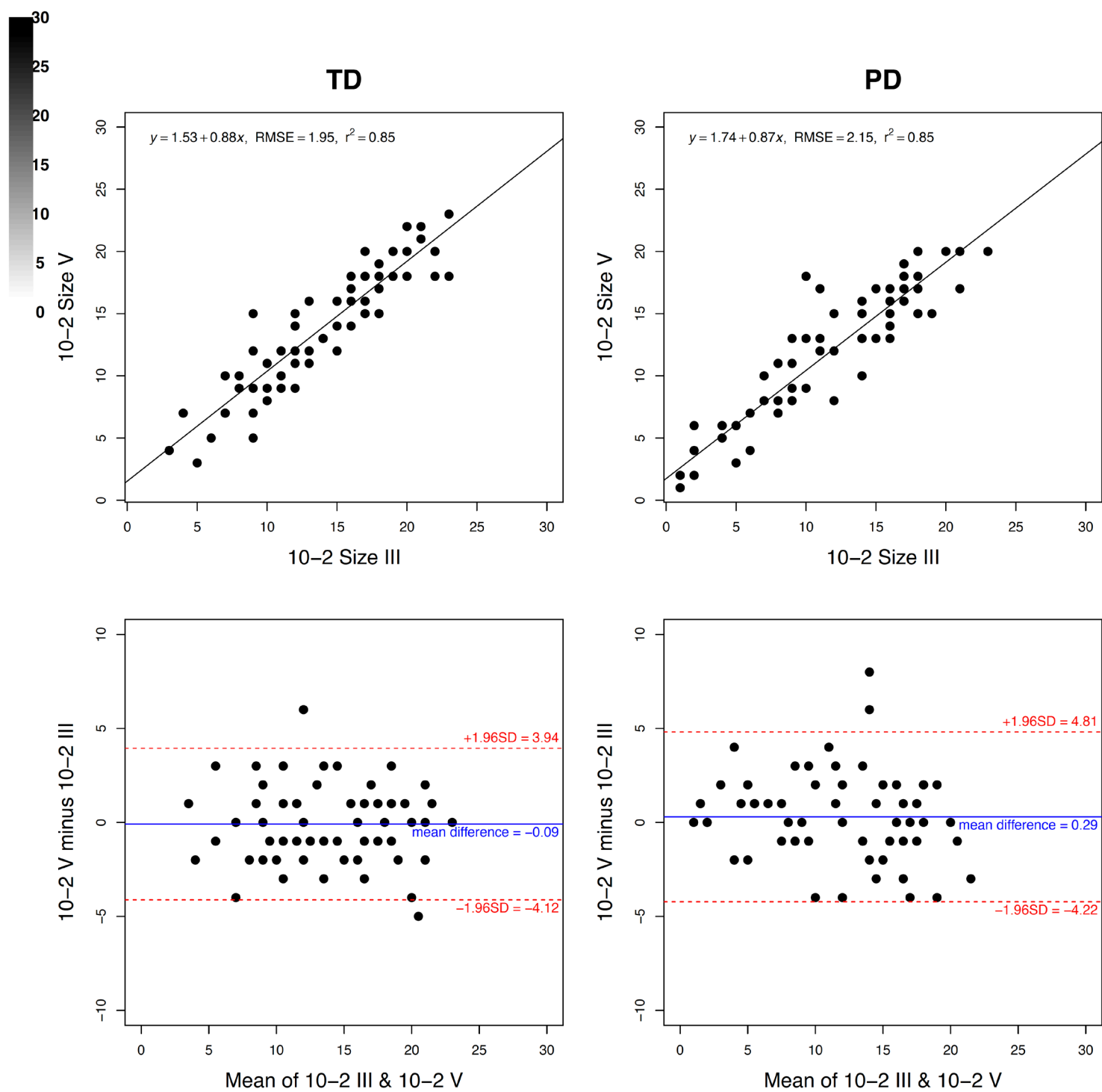


Figure 3 Total number of flagged points across 30 glaucomatous visual fields at the P<5% level at each location. Top row: Scatter plots illustrating correlation between 10-2 size III and size V; Bottom row: Bland-Altman plots illustrating agreement between 10-2 size III and V.