

Supplementary Material

Vision impairment provides new insight into self-motion perception

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Supplementary Material

S1. Results

Head Movement Analysis.

For the normal group, there was a main effect of viewing condition ($F_{2,30} = 19.45$, $p < 0.001$) on head movement oscillations. When looking at only the active viewing conditions, no main effect on head movement oscillations was found ($F_{1,15} = 1.97$, $p = 0.18$). There was no main effect of simulated speed ($F_{3,45} = 0.62$, $p = 0.60$) on head movement oscillations. There were no interactions between these variables ($F_{6,90} = 1.09$, $p = 0.37$).

For the AMD group, there was a main effect of viewing condition ($F_{2,32} = 29.42$, $p < 0.001$) on head movement oscillations. When looking at only the active viewing conditions, no main effect on head movement oscillations was found ($F_{1,16} = 1.62$, $p = 0.22$). There was no main effect of simulated speed ($F_{3,48} = 0.63$, $p = 0.60$) on head movement oscillations. There were no interactions between these variables ($F_{6,96} = 0.37$, $p = 0.89$).

There was a main effect of viewing condition ($F_{2,36} = 36.36$, $p < 0.001$) on head movement oscillations in the glaucoma group. However, when looking at only the active viewing conditions, no main effect on head movement oscillations was found ($F_{1,18} = 0.58$, $p = 0.45$). There was also no main effect of simulated speed ($F_{3,54} = 1.76$, $p = 0.16$) on head movement oscillations. There were also no interactions between these variables ($F_{6,108} = 0.46$, $p = 0.83$) in the glaucoma group.

Follow-up unpaired two-tailed t-tests were performed between the AMD and glaucoma group with normal participants for each active viewing condition and speed. No significant difference was found between the AMD group and normal group for the active pure radial condition and active compensated condition at zero simulated speed ($t_{31} = 1.46$, $p = 0.15$) ($t_{31} = 1.62$, $p = 0.12$), slow simulated speed ($t_{31} = 1.84$, $p = 0.08$) ($t_{31} = 1.48$, $p = 0.15$), medium simulated speed ($t_{31} = 1.75$, $p = 0.09$) ($t_{31} = 1.63$, $p = 0.11$) and fast simulated speed ($t_{31} = 1.57$, $p = 0.13$) ($t_{31} = 1.95$, $p = 0.06$) respectively. No significant difference were also found between the glaucoma group and normal group for the active pure radial condition and active compensated condition at zero simulated speed ($t_{33} = 1.14$, $p = 0.26$) ($t_{33} = 1.62$, $p = 0.11$), slow simulated speed ($t_{33} = 1.34$, $p = 0.19$) (t_{33}

= 1.02, $p = 0.32$), medium simulated speed ($t_{33} = 1.27$, $p = 0.21$) ($t_{33} = 0.85$, $p = 0.40$) and fast simulated speed ($t_{33} = 0.96$, $p = 0.34$) ($t_{33} = 0.94$, $p = 0.35$) respectively.

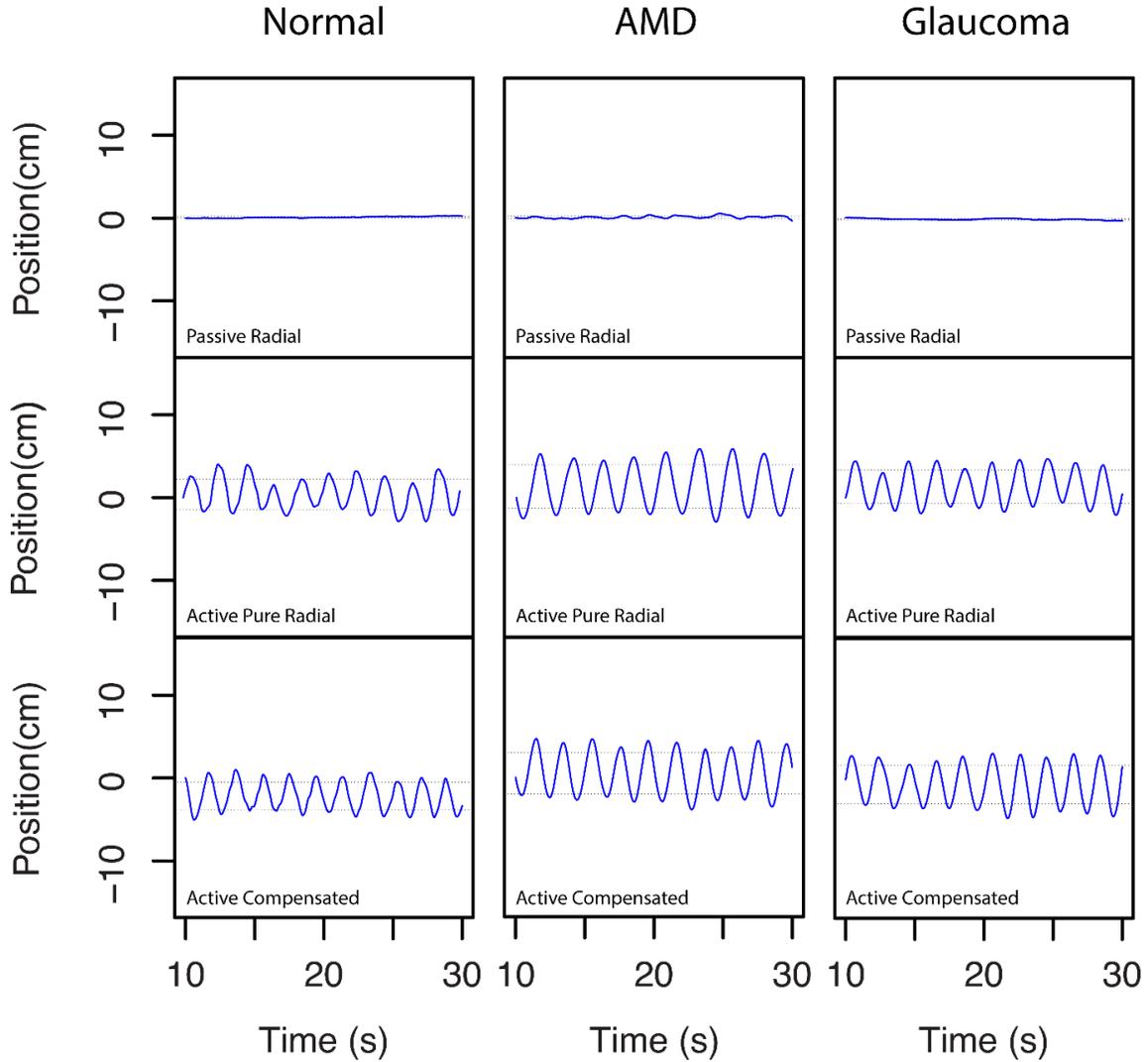


Fig. S1. Time-series plots of horizontal head position over time for normal (left), AMD (middle) and glaucoma (right) groups of participants. Separate axes show data for the fast speed condition with passive viewing (upper), active viewing without compensation (middle) and active viewing with correct compensation (lower). Dashed lines show the results of the method used to estimate the overall range of head translation (± 1.33 SDs).

Table S1: Additional vision functions for participant groups

	Normal	Early Glaucoma		Intermediate Age-related Macular Degeneration
*Mean Contrast Sensitivity (LogCS) ± SD	-	-	R	L
			1.59 ± 0.13	1.60 ± 0.14
Presence of defect on Amsler Grid	-	-	R	L
			6/17	5/17
Taking AREDS supplement	-	-	7/17	
Mean PSD (dB) ± SD	-	R	L	-
		2.77 ± 1.32	2.16 ± 0.59	
GHT				
WNL		5/19	8/19	
Borderline		5/19	5/19	
ONL		9/19	6/19	
VFI (%) ± SD	-	96.42 ± 2.90	97.63 ± 1.27	-

LogCS: Log Contrast Sensitivity, SD: Standard Deviation, PSD: Pattern Standard Deviation, dB: decibel, GHT: Glaucoma Hemifield Test, WNL: Within Normal Limits, ONL: Outside Normal Limits, VFI: Visual Field Index

*Contrast Sensitivity was measured using MARS Contrast Sensitivity Test (The Mars Perceptrix Corporation, NY, U.S.A).