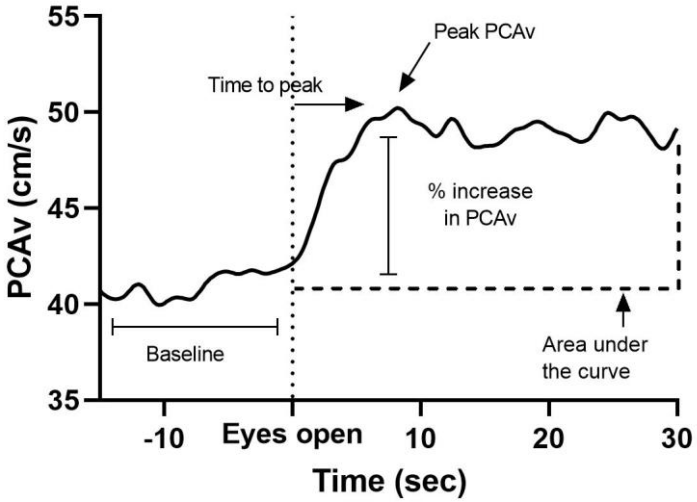
Supplementary information:



Supplementary Figure 1. Average representative trace of the posterior cerebral artery velocity averaged across 5 transitions during the visual stimulus, highlighting the outcomes derived from the neurovascular coupling assessment.

Supplementary Table 1. Peak cerebrovascular responses to visual stimulation

Variables	Total		Young (18 - 35 years)		Middle aged (35 - 65 years)		Older (65 - 80 years)	
	Males (N=30)	Females (N=34)	Males (N=10)	Females (N=10)	Males (N=12)	Females (N=14)	Males (N=8)	Females (N=10)
PCAv (cm/s)	45.5±9.9†	48.8±12.0	44.0±9.3^{b}	57.6±12.7^{b}	48.5±10.6^{c}	47.9±9.7^{c}	42.9±9.3^{b,c}	38.4±6.3^{b,c}
CVRi (mmHg/cms^{-1})	2.6±0.6	2.6±0.8	2.5±0.5^{b}	2.0±0.8^{b}	2.5±0.6^{c}	2.7±0.7^{c}	3.0±0.8^{b,c}	3.4±0.5^{b,c}
CVCi (cms^{-1}/mmHg)	0.5±0.1†	0.5±0.2	0.5±0.1^{a,b}	0.7±0.2^{a,b}	0.5±0.1^{a,c}	0.5±0.1^{a,c}	0.4±0.1^{b,c}	0.4±0.1^{b,c}
NVC (%)	14.1±9.2	14.5±7.6	15.4±9.3	10.3±5.4	15.2±8.4	14.9±8.1	11.0±10.9	19.3±6.8
MAP (mmHg)	97±10*	109±13	96±10	105±15	97±11	120±11	99±10	113±14
PCAv Amp (cm/s)	6.3±2.5	6.0±2.6	6.4±2.4	4.8±1.9	7.2±1.6	6.8±3.1	5.1±3.3	6.0±2.3
PCAv τ (s)	4.6±2.3	4.3±4.2	4.4±2.1	2.6±2.1	4.5±1.5	5.8±4.9	4.8±3.5	3.9±1.6
PCAv TD (s)	0.2±1.2*	2.7±3.3	0.08±1.1	3.5±1.3	0.4±1.4	3.3±4.4	0.2±1.0	1.0±0.6
PCAv MRT (s)	4.8±1.8	7.6±5.1	5.0±1.9	7.1±1.7	4.9±1.3	9.1±6.5	4.6±2.6	4.9±4.9

*Data presented as mean ± SD deviations. Data were compared using a two-way ANOVA with main effects of age (males, females) and sex (young, middle, older). Asterix * indicates significant difference between males and females (P<0.05). When main effect of age is present post-hoc pairwise comparisons (Bonferroni) reveal where significant differences lie: a=young vs middle, b=young vs older, c=middle vs older. Symbol † indicates significant age by sex interaction effect (P<0.05). Pairwise comparisons for the interaction effects for peak PCAv and CVC revealed a difference between males and females for young adults only (P=0.02 for both). In females there was a significant difference between for PCAv between all age groups (P≤0.04). For peak CVC, in females there was a difference between young adults compared to middle (P=0.001) and older aged adults (P<0.001). PCAv, posterior cerebral artery; CVRi, cerebrovascular resistance index; CVCi, cerebrovascular conductance index; NVC, neurovascular coupling; MAP, mean arterial pressure; Amp, amplitude; τ, time constant.*