Supplemental Material for:

Effects of Eccentricity on the Attention-Related N2pc Component of the Event-Related Potential Waveform

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S1 Contralateral-minus-ipsilateral difference waves before collapsing across magnification

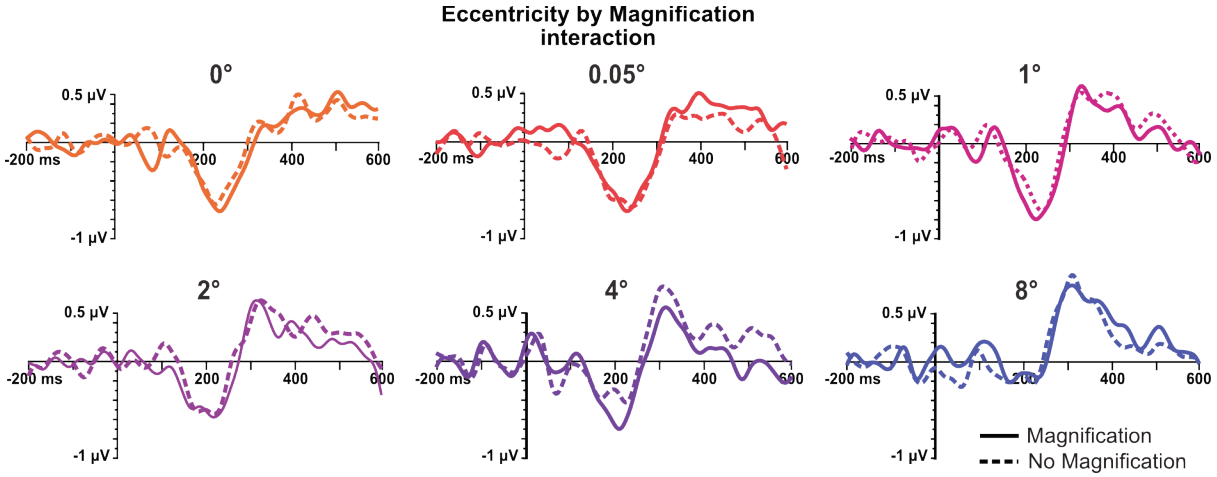

Figure S1: Grand average contralateral-minus-ipsilateral difference waves, averaged across the posterior electrodes, as a function of eccentricity and magnification. Two-way ANOVAs did not yield a significant main effect of magnification on the N2pc amplitude ($F(5,19) = 1.60$, $p = 0.208$) or the PNP amplitude ($F(5,19) = 0.165$, $p = 0.689$). There was no significant interaction between eccentricity and magnification in either case (N2pc: $F(5) = 0.183$, $p_{HF} = .845$; PNP: $F(5) = 1.12$, $p_{HF} = .355$).

S2 Contralateral and ipsilateral parent waveforms at each eccentricity

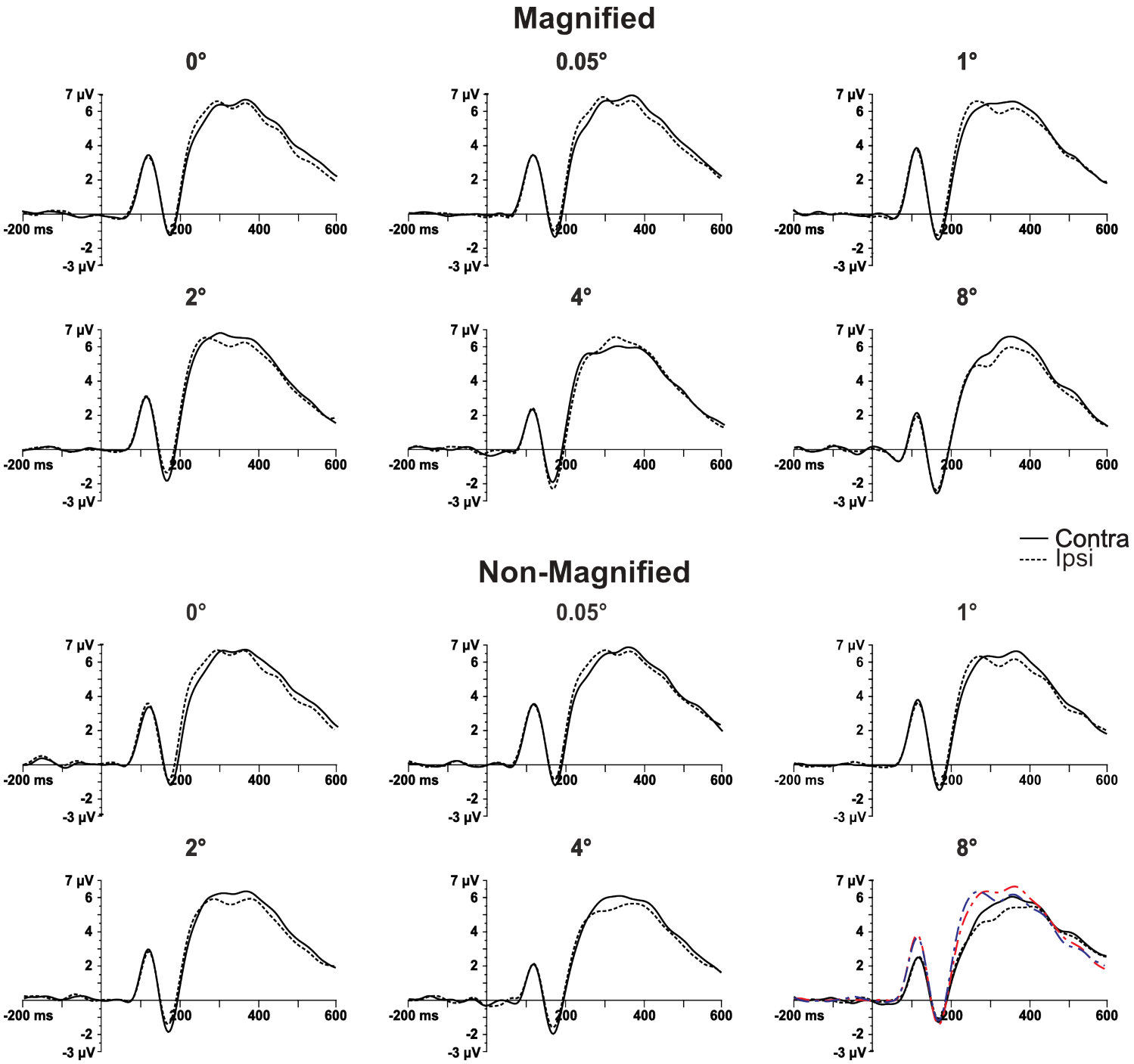

Figure S2: Contra- (solid) and Ipsi- (dashed) parent waves, before the subtraction to create difference waves. The ERPs shown are the average of posterior and occipital sites. ERPs on top are responses to stimuli that were magnified by the cortical magnification factor, while those in the bottom are the responses to the non-magnified stimuli.

S3.1 Lateralized alpha power analysis: Methods

The N2pc is sometimes accompanied by a lateralized suppression of alpha-frequency EEG activity (Bacigalupo & Luck, 2019; Worden, Foxe, Wang, & Simpson, 2000), and we analyzed this activity using time-frequency analysis to see if it varied across eccentricities.

The EEG preprocessing was identical to that described for the N2pc and PNP, with one key difference: to avoid edge artifacts during our time of interest, the EEG was segmented into wider epochs (-1000 to 1500 ms from stimulus onset).

Time-frequency analysis was performed using the methods described by Bacigalupo and Luck (Bacigalupo & Luck, 2019). We used 3-cycle Morlet wavelets, starting at 2 Hz and going up in 1 Hz increments until 30Hz. The wavelet width was chosen to maximize temporal resolution. To isolated induced activity, the averaged ERP for a given trial type was subtracted from EEG for each trial of that type. The power at each frequency was then calculated every 48 ms, spanning the whole epoch, and converted to the decibel scale. The time-frequency transform was computed for each individual trial, and the transforms were averaged together to produce a single time × frequency matrix for each condition. The average induced power (in dB) between -300 and -100 ms from stimulus onset (at each frequency) was used as an absolute baseline and was subtracted from all time-points.

Lateralized alpha was calculated by subtracting the induced activity from 8-12 Hz in the ipsilateral hemisphere from that in the contralateral hemisphere. Only the activity in the P3 and P4 electrodes between 200-600 ms was considered for statistical analysis. These analysis parameters were decided a priori to mimic the analyses used in our previous study (Bacigalupo & Luck, 2019).

S3.2 Lateralized alpha power analysis: Results

To isolate lateralized alpha suppression, we performed a contra-minus-ipsi power difference at the 8-12 Hz frequency bands. The resulting difference in power at each eccentricity is shown in Figure S3.2 We found a relatively small (M = -0.11 dB, SD = 0.150 dB) but significant ($t(19) = -3.42$, $p = .003$) suppression of alpha power overall. Neither eccentricity nor magnification seemed to matter, with no clear patterns in either. However, it is possible that the amount of alpha suppression too small to see a substantial lateralization of the suppression.

A two-way ANOVA yielded no significant main effects of eccentricity ($F(5, 95) = 1.80$, $p_{HF} = .137$) or magnification ($F(1, 19) = 0.28$, $p = .603$), and no interaction ($F(5, 95) = 1.20$, $p_{HF} = .316$).

To match our analysis of the N2pc and PNP amplitudes, we also performed paired comparisons between successive eccentricities. We found no significant differences between neighboring eccentricities (see Table 1 for exact values) or between the 0° and 8° conditions ($t(19) = -0.99$, $p = .334$).

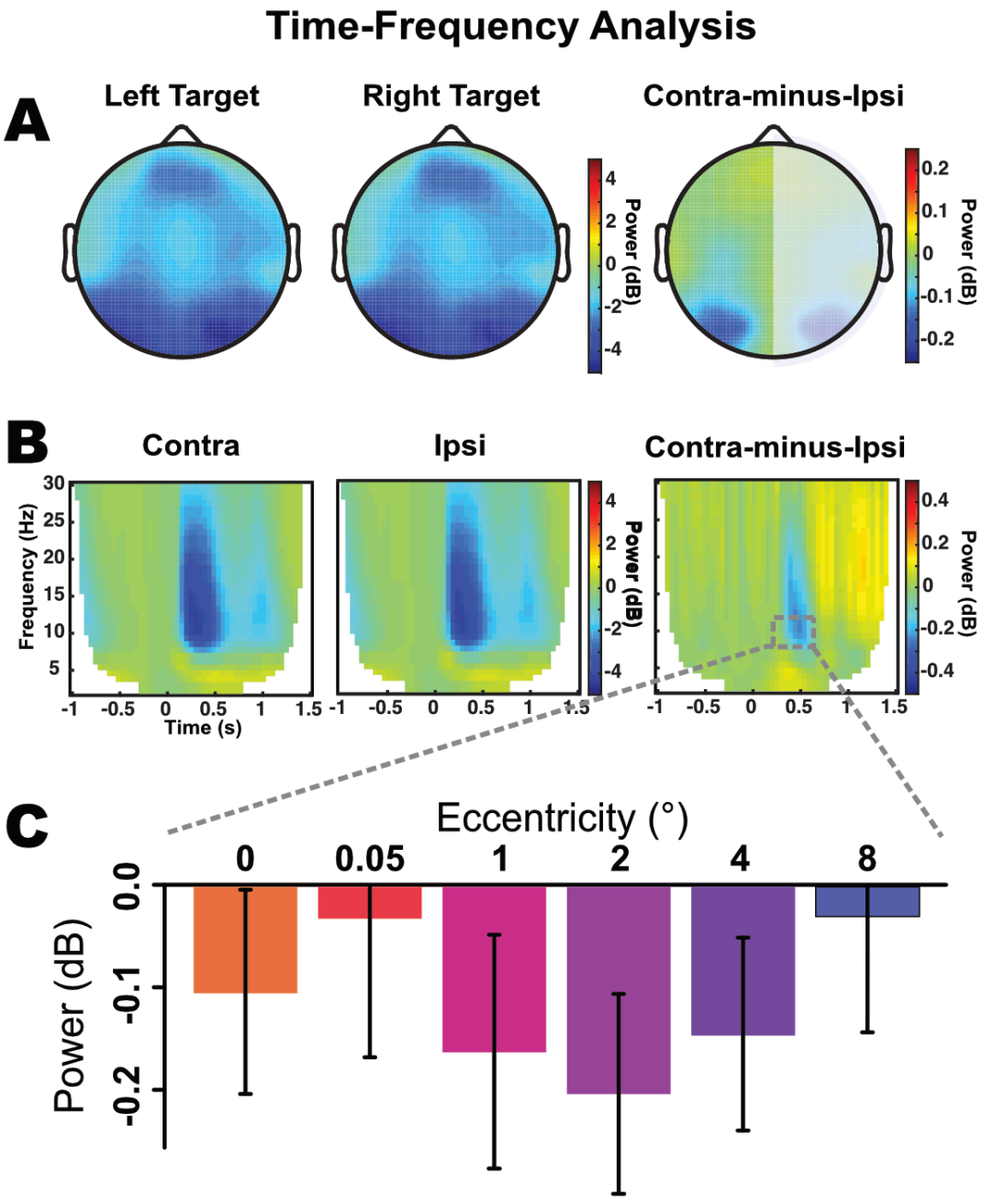

Figure S3.2: Results from the time-frequency analysis. (A) Topography of alpha power when the target was on the left or the right, as well as the topography of the contra-minus-ipsi difference in alpha power. (B) Time frequency plots for the PO3/PO4 electrodes, showing the response at the contralateral and ipsilateral electrodes, as well as the contra-minus-ipsi difference. (c) Overall alpha power at PO3/PO4 as a function of eccentricity.