# Supplemental Material

## Investigation of post-saccadic effects on pre-saccadic characteristics

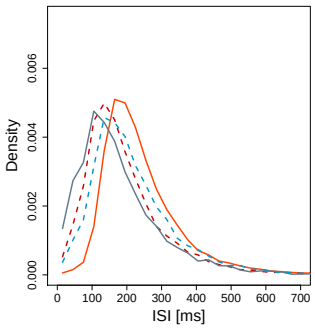
A strong effect of microsaccades and saccades on subsequent drift motions is reported by Chen and Hafed (2013). Here, we investigate whether our pre-microsaccadic effect could be caused be the post-(micro)saccadic enhancement from earlier saccades. We analyze this problems by systematic variation of the cutoff value for the minimum duration between saccadic events. In the main text, the minimum inter-saccadic interval was chosen as 100 ms, where the first 50 ms were discarded and the box-count was computed from the remaining epoch between 50 ms and 100 ms.

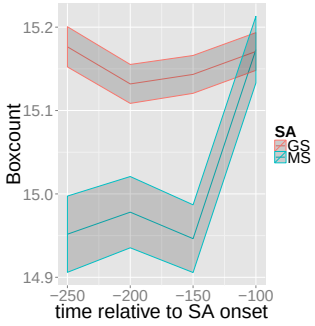
In Table 1, the densities of the resulting inter-saccadic intervals, the temporal evolution of the pre-saccadic box-count, and the results of linear mixed-effect modeling are shown for different conditions of the cutoff value of the inter-saccadic interval. While the distribution of ISIs changes strongly, we retain a statistically reliable effect of the box-count measure.

We conclude that the pre-microsaccadic increase from interval condition 2, i.e., 150 ms to 100 ms before microsaccade onset, to interval condition 1, i.e., 100 ms to 50 ms before microsaccade onset, is not a simple consequence of post-microsacadic enhancement. Also, the effect of microsaccadic enhancement lasts only about 70 ms to 100 ms after the microsaccade.

Table 1: The three panels present the analyses based on different values of ISI cutoff for the selection of drift epochs. The three columns report the resulting ISI distribution, the mean temporal evolution of drift before saccade onsets, and the results from linear mixed-effect modeling of box-count before saccadic events (SA). A sliding difference contrast evaluates the differences between subsequent intervals and the orientation Δ(Vertical-Horizontal). Interval cutoffs define condition 1, −100 ms to −50 ms, condition 2, −150 ms to −100 ms, condition 3, −200 ms to −150 ms, and condition 4, −250 ms to −200 ms, measured relative to saccade onset.

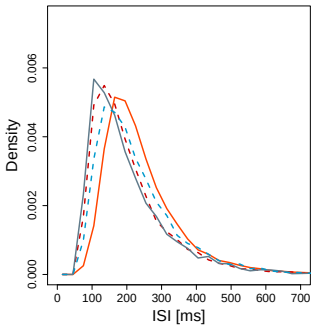
**ISI > 50 ms**

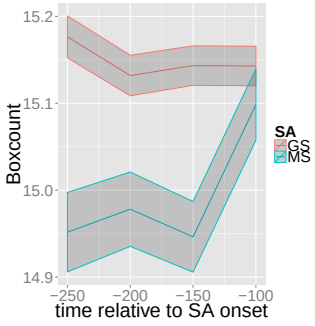



| | GS $\beta$(t) | MS $\beta$ (t) |
|---|---|---|
| (Intercept) | 15.13 (27.5) | 15.02 (26.8) |
| Orientation | -0.61 (31.6) | -0.42 (11.3) |
| ΔBX (2-1) | -0.03 (1.3) | -0.21 (4.4) |
| ΔBX (3-2) | -0.01 (0.4) | 0.03 (0.7) |
| ΔBX (4-3) | 0.05 (1.8) | 0.01 (0.3) |

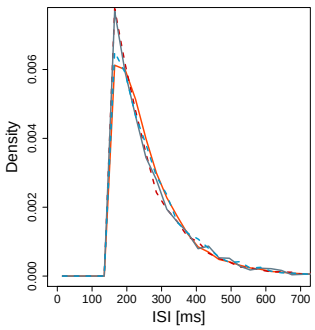
**ISI > 75 ms**

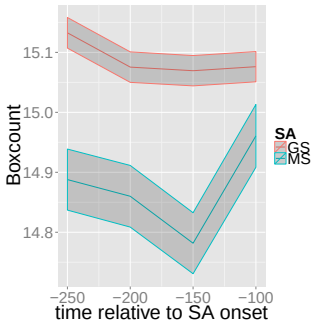



| | GS $\beta$(t) | MS $\beta$ (t) |
|---|---|---|
| (Intercept) | 15.13 (27.5) | 15.02 (26.8) |
| Orientation | -0.61 (32.0) | -0.42 (11.3) |
| ΔBX (2-1) | -0.00 (0.2) | -0.13 (2.5) |
| ΔBX (3-2) | -0.01 (0.3) | 0.02 (0.3) |
| ΔBX (4-3) | 0.05 (1.8) | -0.02 (0.4) |

**ISI > 150 ms**




| | GS $\beta$(t) | MS $\beta$ (t) |
|---|---|---|
| (Intercept) | 15.08 (27.5) | 14.89 (26.3) |
| Orientation | -0.67 (32.2) | -0.53 (11.9) |
| ΔBX (2-1) | -0.01 (0.4) | -0.17 (2.8) |
| ΔBX (3-2) | 0.01 (0.2) | 0.03 (0.6) |
| ΔBX (4-3) | 0.06 (2.0) | 0.07 (1.2) |