Supplementary Materials

Figure S1 summarizes the implementation of the stimuli for both Mask and No Mask conditions in experiment 1. The example illustrates a gap at 20% from the beginning of the smear. Average delay between actual saccade start and online saccade detection was estimated as 12 ms, and average saccade duration was estimated individually for each subject after a pretest of 50 trials.

In the No Mask condition $duration_{smear} = duration_{saccade} - 2 \text{ delay}$ and therefore $center_{gap} = 0.2 \ times duration_{saccade}$ in this example. The command to the LED (to switch it on, and then off for 5 ms around the gap center, and then on again, and then off at the end of the smear) was sent as soon as the saccade was detected.

In the Mask condition, the LED is turned on at the saccade go signal and stays on. As soon as a saccade is detected, a new command is sent to the LED (to keep it on and then turn it off for the duration of the gap and then on again until the end of the backward mask). In this condition $duration_{smear} = duration_{saccade}$. Since the duration of the smear is slightly longer than for the No Mask condition, we adjusted the timing of the gap with respect to the total duration of the smear so it would also be presented at 20% of the smear. Therefore in the mask condition $center_{gap} = 0.2 \ times duration_{saccade} - \text{ delay}$.

The command to the LED at online saccade detection produced the same smear duration ($duration_{saccade} - 2 \text{ delay}$) for both Mark and No Mask conditions. In the Mask condition, the LED stayed on for another 300 ms. These additional 300 ms therefore started before the end of the saccade (12 ms before the end of the saccade, on the average, if average saccade duration remained constant). However, saccade duration increased over the experimental session by an average of 9 ms, probably due to fatigue (Bahill & Stark, 1975). These two factors explain why the actual backward mask duration was shorter than 300 ms.

Figure S2 illustrates the filtering and correction applied to a saccade.

Supplementary references