Pre-saccadic information interacts with post-saccadic processing in V1

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Introduction

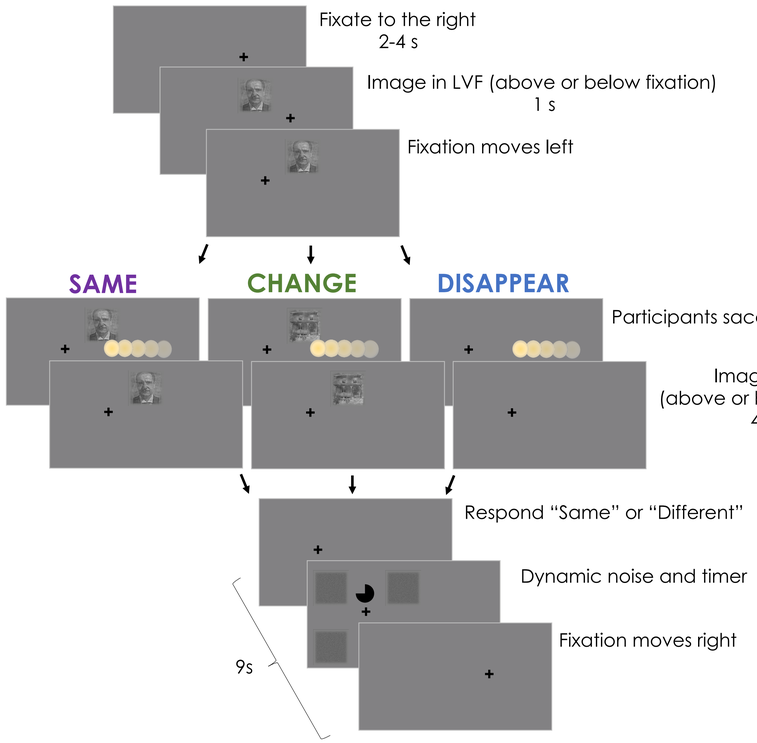
Visual input is disrupted ~4 times per second by eye-movements[1]

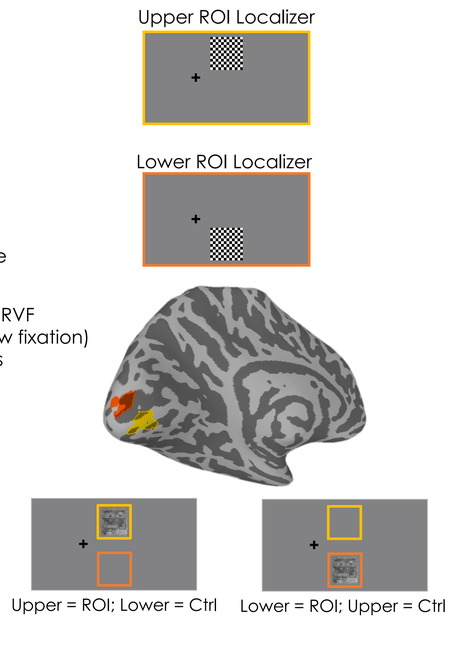
Evidence suggests we collect and maintain pre-saccadic information for post-saccadic processing[2]

In primary visual cortex (V1), remapping the location of salient information has been found with saccades[3, 4]

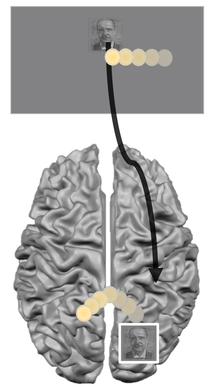
Does pre-saccadic feature information transfer with saccades and interact with post-saccadic processing in V1?

Method





Hypothesis

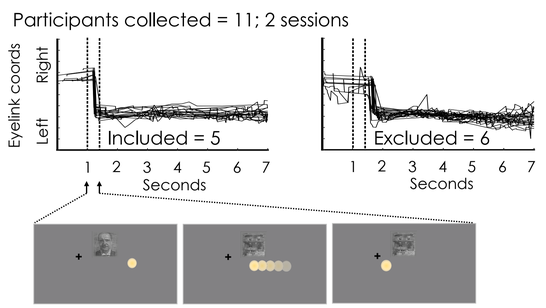


If pre-saccadic information transfers to left V1 with saccade, House vs Face decoding in left V1 will be:

Strong for **SAME** condition

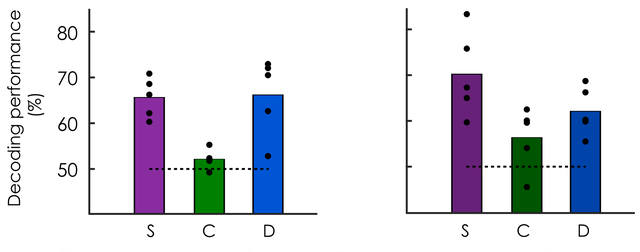
Poorer for **CHANGE** condition

Strong for **DISAPPEAR** condition?



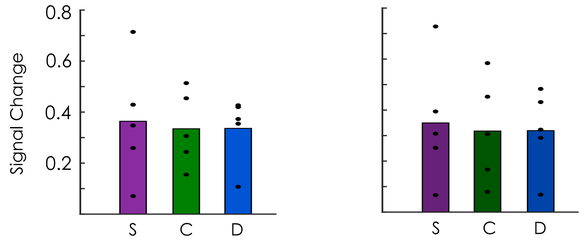
Preliminary Results

Classify Face vs. House – Left V1



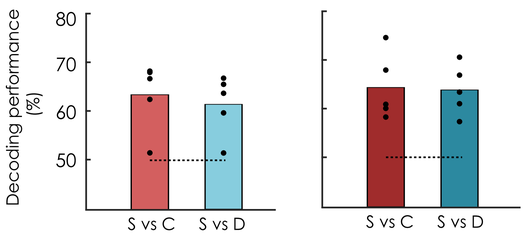
Stronger decoding for Same and Disappear compared to Change

Signal change for each condition



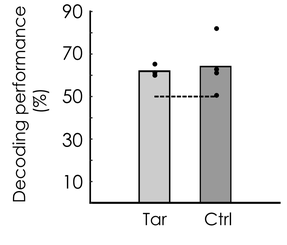
Same, Change, and Disappear activate left V1 equally

Classify between conditions



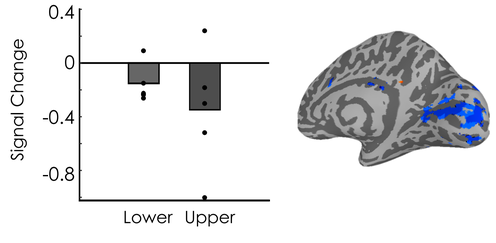
Classifier distinguishes between Same and Change, and Same and Disappear conditions.

Classify Face vs. House



Classifier decodes between face and house in right V1.

Rightward saccade activity



Right V1 has a negative response to large rightward horizontal saccades

Preliminary Conclusion

Pre-saccadic information impacts post-saccadic processing in V1[4]

The signal is present in both the target and control ROIs before and after saccade, suggesting a global processing signal[5]

Feedback alone in the Disappear condition provides different information than in the Same condition with feedforward and feedback input

Disappear activity unlikely due to saccade alone[3]

References

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