

The trans-saccadic preview effect: Adaptation or active vision?

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Our eyes move about three times per second which divides apparently continuous vision into rather discrete snapshots. These spatiotemporal dynamics implied in active vision bring about statistical regularities which impact on perceptual processing. An example are preview effects, which demonstrate that extrafoveal pre-saccadic information contributes to post-saccadic foveal processing. Preview effects can be found in task performance, eye-movement behavior, and fixation-related neural responses. However, at least three theoretical accounts can explain in particular the early post-saccadic preview effect in fixation-related neural responses which has been in the focus of previous research. First, early post-saccadic preview effects could simply result from adaptation of neurons with very large receptive fields which would mean that the preview effect could be largely independent from active vision. Second, they could result from processes that are specific to eye movements which would indicate that the preview effect relies on active vision. Third, they could result from spatiotopic adaptation which would be related to eye-movements but make opposite predictions compared with the active vision account under certain experimental conditions. We critically compare these theoretical accounts to interpretations of trans-saccadic perception in terms of predictive processing and present first results from a MEG and eye-tracking coregistration study that has been designed to differentiate between these possible explanations.

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