

# Calibration of peripheral perception: A blocking paradigm that highlights generalization

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With each saccade, a visual object shifts its eccentricity on the retina and so dramatically changes the form of its cortical representation. The visual system would deal with these saccade-induced changes by predicting the visual features of an object after an eye movement (Herwig & Schneider, 2014; Valsecchi & Gegenfurtner, 2016). We recently proposed that a general learning process would link peripheral and foveal stimulus information to make these predictions (Paeye, Collins, Cavanagh, & Herwig, 2018). Here, we examined the effects of learned transsaccadic associations on the perception of novel peripheral stimuli. To do so, we implemented a *blocking procedure*. In this paradigm a previously conditioned stimulus is known to interfere with the conditioning of a novel stimulus. We asked whether such an interference would occur and leave intact the perception of new stimuli or if transsaccadic learning would generalize.

We adapted Herwig and Schneider's (2014) study. In a first acquisition phase, participants ( $n=11$ ) were exposed to unicolor, circular objects whose frequency systematically decreased during a saccade, and to square objects whose frequency did not change. The second acquisition phase was the same except that a second color was added to both objects (now bicolored). Participants had to judge the peripheral frequency of unicolor circles and squares of each of the two colors in a pre- and a post-acquisition phase.

Following acquisition, the perceived frequency of the changed objects significantly decreased whereas judgments of the unchanged objects were not modified ( $F_{(1,10)}=11.969$ ,  $p=0.006$ ,  $BF_{\text{incl}}=25.957$ ). Importantly, frequency judgments were not affected by object color ( $F_{(1,10)}=0.042$ ,  $p=0.841$ ,  $BF_{\text{incl}}=0.335$ , non-significant interaction:  $F_{(1,10)}=2.822$ ,  $p=0.124$ ,  $BF_{\text{incl}}=0.590$ ).

These data indicate that the bias of peripheral perception towards previously associated stimuli seen in foveal vision transfers to stimuli of a different color not presented previously. Such a generalization highlights the importance of high level processes in peripheral perception.