



Long-term face aftereffects are more robust following distributed adaptation

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Abstract

Adaptation is an automatic neural mechanism to maximize sensitivity and efficiency of the visual system on the basis of previous experiences. The study of perceptual short-term effects of adaptation has a long tradition, but the mechanisms underlying long-term aftereffects are still poorly understood. Long-term aftereffects can last for days, weeks, and even months suggesting a significant role of adaptation in learning about the visual properties of the world. Here, we tested how the organization of different adaptation protocols affects the robustness of face distortion aftereffects along multiple time scales. In all experiments, adaptation to a distorted image of a famous person biased participants' perception of the original faces. The time taken to deadapt from this initial effect and the degree to which adaptation effects recovered following an interval without further adaptation were used as measure of the robustness of long-term effects. Long-term effects were more stable in groups of participants who adapted in a distributed fashion (10 × 1 min of adaptation over 1h) compared to a group of

participants who underwent blocked adaptation (1×10 min over 1h). Data from measures of electrophysiology (i.e., EEG) complement the behavioral findings. These findings are in support of the claim that adaptation changes the neural representations of our environment also in a lasting manner. Furthermore, long-term effects are modulated by the temporal organization of adaptive experiences.

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