Immediate effect of internal reward on visual adaptation

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Abstract

In the last decade there has been increasing interest in the effects of rewards on visual perception. Exogenous rewards have been shown to increase visual sensitivity and to affect attentional selection. Humans, however, feel rewarded also by the correct accomplishment of a task. It has been proposed that this form of endogenous reward triggers reinforcement signals in the brain. These signals increase sensitivity to stimuli extensively and repeatedly paired with the rewarding experiences and modulate long-term cortical plasticity. Here, we report the striking observation that a well-known visual illusion, the tilt aftereffect, which is due to a form of short-term cortical plasticity, is immediately enhanced by a concurrent and independent target recognition process. Our results show that endogenous rewards can alter our visual experience with virtually no delay.