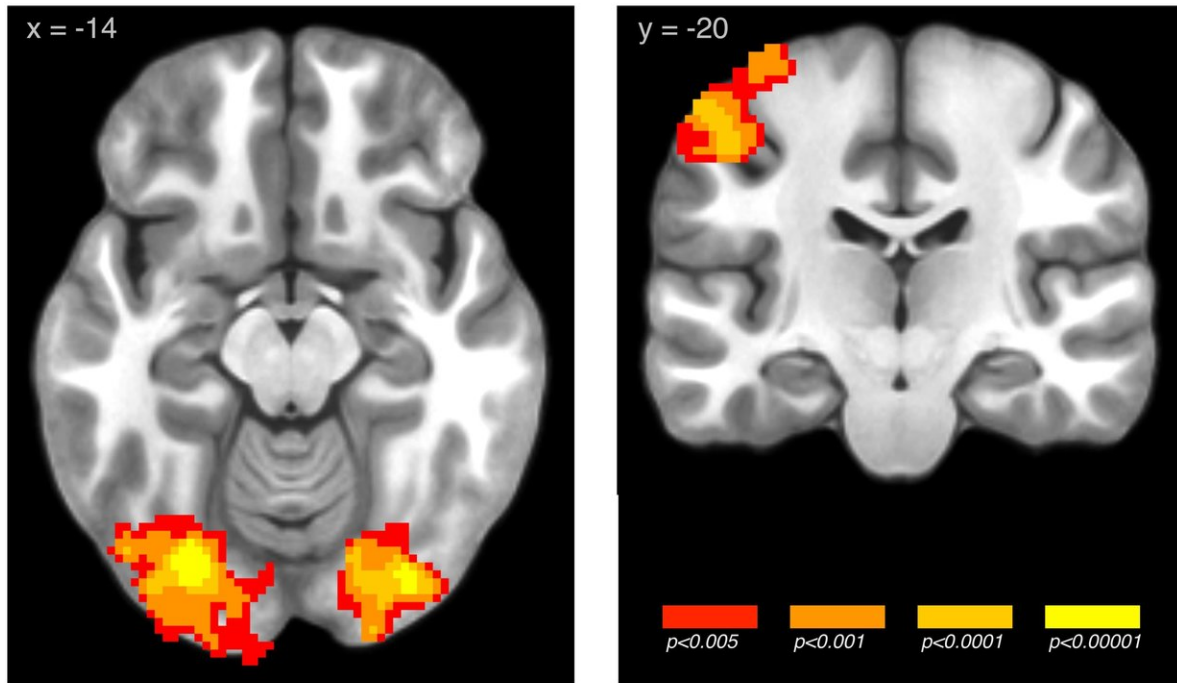# How time affects learning

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Credit: Wimmer et al., *JNeurosci* (2018)

Associations between neutral stimuli and monetary rewards are strengthened over the course of weeks of learning, according to a human study published in *JNeurosci* that investigated learning over an extended period of time. The research may have implications for the study of addiction, in which learned associations between drug and reward are acquired gradually.

Studies of [reward-based learning](#) in humans typically involve minutes-long training sessions. These experiments contrast with most animal research that involves learning over days or weeks, limiting the translation of this research to humans. In addition, rapid learning tasks are not representative of how people actually develop their preferences over time.

Elliott Wimmer and colleagues found that men and women better retained arbitrary associations between pictures of landscapes and [monetary gain](#) when they learned the associations in short sessions spaced out over weeks compared to a single, 20-minute session. The researchers' neuroimaging data reveal that training led to greater engagement of learning-related regions of the brain. each type of learning engaged different parts of the brain.

These results provide a starting point for exploring how learned associations that have negative effects on human health and wellbeing, as in addition, could be unlearned.

  More information: Reward learning over weeks versus minutes increases the neural representation of value in the human brain, *JNeurosci* (2018). [DOI: 10.1523/JNEUROSCI.0075-18.2018](#)

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