MedicalXpress

Magnifying mistakes boosts motor skills past a performance plateau

August 4 2016

Exaggerating the visual appearance of mistakes could help people further improve their motor skills after an initial performance peak, according to a new study published in *PLOS Computational Biology*.

Previous research has shown that manipulating the perception of mistakes can improve motor skills. Dagmar Sternad, Christopher Hasson and colleagues from Northeastern University in Boston and Hokkaido University in Japan set out to examine whether this strategy could further enhance skills after they plateau.

In the study, 42 healthy participants learned a virtual tetherball-like game in which they tried to hit a target with a ball hanging from a pole. After three days, all players reached a performance plateau. Then, for some players, the researchers secretly manipulated the game so that the distance by which the ball missed the target appeared bigger on screen than it actually was.

Participants whose mistakes appeared at least twice as bad as they really were broke past their plateau and continued sharpening their tetherball skills. A control group that remained undeceived showed negligible improvement.

By analyzing the players' actions using computational learning models, the researchers found that error exaggeration did not change how they made corrections in their throwing techniques. Instead, it reduced random fluctuations, or noise, in nervous system signals that control

muscle movement. These findings challenge existing assumptions that such noise cannot be reduced.

The authors point out that their results could help improve strategies to aid people who have reached a motor skills plateau, including elite athletes, healthy elders, stroke patients, and children with dystonia. Future research could reveal the physiological mechanisms underlying the findings.

More information: Christopher J. Hasson et al. Neuromotor Noise Is Malleable by Amplifying Perceived Errors, *PLOS Computational Biology* (2016). DOI: 10.1371/journal.pcbi.1005044