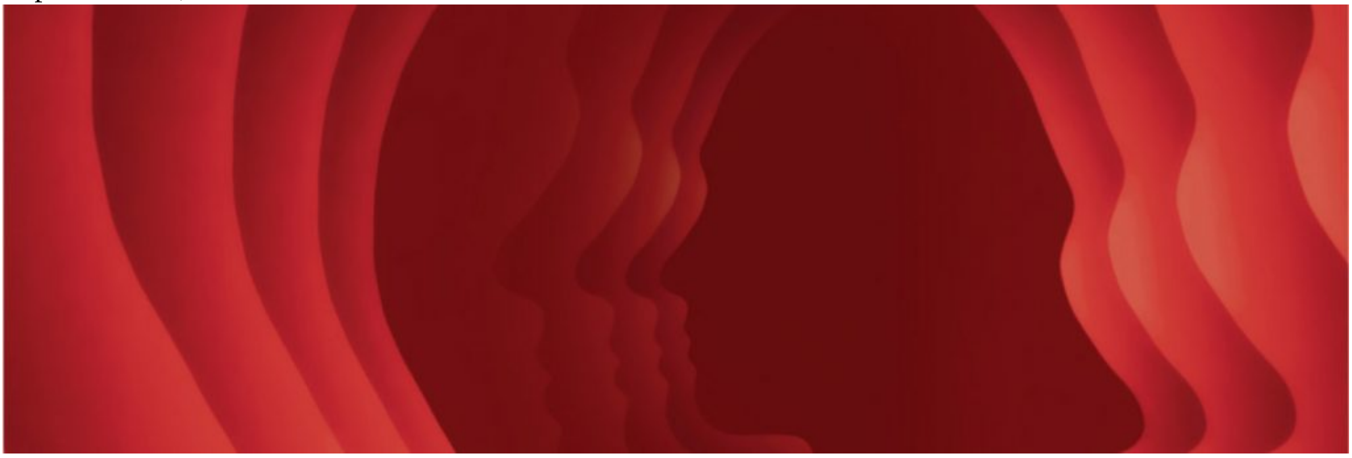
New Research From Psychological Science

September 06, 2019



Read about the latest research published in *Psychological Science*:

Suboptimal Engagement of High-Level Cortical Regions Predicts Random-Noise-Related Gains in Sustained Attention
Siobhán Harty and Roi Cohen Kadosh

Noninvasive brain stimulation (NIBS) allows researchers to assess how experimentally induced changes in brain processes affect behavior. In this study, Harty and Kadosh examined whether a neural biomarker associated with attentional control, the ratio between resting-state electroencephalogram (EEG) low- and high-frequency power (the theta:beta ratio), could influence the effects of NIBS on attention. The researchers used high-frequency transcranial random-noise stimulation (tRNS) as a NIBS method. During tRNS, alternating current is delivered to the brain at random frequencies and intensities, within specified ranges. Before, during, and after the tRNS stimulation, participants performed a sustained-attention task in which they continuously monitored a flickering pattern on a screen for intermittent targets. EEGs to evaluate the theta:beta ratio were recorded before and after tRNS. When participants received a specific type of tRNS (1 mA), they tended to perform better in the sustained-attention task. This improvement was still evident for at least 24 min after tRNS. Participants who had a higher theta:beta ratio showed poorer sustained attention but benefitted more from the 1-mA tRNS. These data indicate that different theta:beta ratios may influence the effects of NIBS on behavior. The theta:beta ratio may also distinguish subsets of individuals who do not engage the brain networks required for sustained attention in an optimal manner. Thus, the authors suggest that acquiring information about certain EEG markers as part of screening protocols may help to determine whether individuals are likely to benefit from interventions.

Separate Contribution of Striatum Volume and Pitch Discrimination to Individual Differences in Music Reward
Mireia Hernández, María-Ángeles Palomar-García, Benito Nohales-Nieto, Gustau Olcina-Sempere, Esteban Villar, Raúl Pastor, César Ávila, and Maria-Antònia Parcet

Enjoyment of music seems to be related to the structure of the brain region involved in the processing of rewards and the ability to discriminate sound pitch, this research suggests. Musicians and nonmusicians completed (a) a music-reward questionnaire that measured how much pleasure they derive from music and (b) a test of tone deafness, in which they evaluated whether brief paired musical phrases that could differ in the pitch of a single note were the same or different. The researchers also ran an MRI to assess the volume of each participant's striatum — a group of nuclei involved in the processing of rewards that includes the caudate and the nucleus accumbens. All musicians and nonmusicians with lower striatum volume seemed to derive greater pleasure from music. However, enjoyment of music did not depend solely on brain structures but also on auditory capacities: Musicians and participants better at discriminating pitch also seemed to get greater pleasure from music. Hence, individual differences in pleasure from listening to music likely depend on the interplay between auditory abilities and the functioning of the brain's reward network.