Shocking the Brain for Hyper-Learning

By: Rapid Access International, Inc.

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Earlier this year, at the 2019 Consumer Electronics Show (CES) convention , San Francisco-based Halo Neuroscience unveiled the second version of their product: The Halo Sport 2 headphones.

The Halo Sport 2 incorporates audio headphones, but the real technology with the product is its neuropriming headband that 'shocks' the brain into a state of 'hyper-learning'. The band is outfitted with soft electrodes, which the company refers to as 'primers'. These primers transmit electrical pulses to the brain; the intensity of which can be controlled through a smartphone application.

The idea is to use this device for 20 minutes before an activity to create a state of 'hyper-learning' by neuropriming. In other words, 'exciting' the tissue in your brain artificially before an activity and thereby improving one's capability to learn and embed new movements. The theory goes that if your brain is more 'plastic' when you try to learn a new skill, be it drumming, running correctly or shooting three pointers in basketball, you'll absorb it quicker.[1]

From Niche to Broader Appeal?

The earlier version of the headphones were not widely owned. They were too expensive for most at a price of $750. But, after the success of their initial model with elite athletes, the Halo 2 headphones are now priced lower for broader consumer appeal.

The sound quality of the headphones has been compared by the company's CEO, Dr. Daniel Chao, to the Beats Pro. And, at a price of $399USD, they might be seen my many consumers as a compelling alternative.

Interesting that this should be considered the target market. Originally this system wasn't conceived as a set of headphones, but a band that looped over the head and hooked behind the ears. It only incorporated the audio headphone functionality because Chao said it just looked too ugly. The ear cups were added for comfort and style, and wired headphones were put in as an afterthought.[2]

Evidence of Functionality (…and Safety)

This technology is not exactly new. To be sure, the claims come across as questionable at first brush. And, it follows that most would tend to further question the safety of transmitting electrical currents to the brain.

On the point of safety, there is actually a lot of science and study behind the technology, which is known as transcranial direct current stimulation (tDCS). The company's website touts the product as "100% safe" and notes that the U.S. Food and Drug Administration (FDA) has ruled the Halo Sport headphones as 'general wellness' devices, which are safe to use for healthy users.

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[1] Beavis, Gareth. "The Halo Sport 2 electrically shocks your brain into helping you learn to juggle". Tech Radar. January 11, 2019. Available at: https://www.techradar.com/news/the-halo-sport-2-electrically-shock-your-brain-into-helping-you-learn-to-juggle. Accessed on June 28, 2019.

[2] *Ibid.*

The claims of safety seem convincing enough. Although, further study and confirmation will be helpful and, no doubt, a goal for the company and any others looking to develop products and technologies that aim to non-invasively cause transcranial direct current stimulation (tDCS) to affect cognitive function and behavior.

Halo Neuroscience co-founders Dr. Daniel Chao and Dr. Brett Wingeier founders have had success in the past with neurostimulation technologies. They had previously spent 10+ years developing the world's first closed-loop neurostimulator to treat epilepsy; an FDA-approved product.

This prior research lead them to the development and release of the first Halo Sport in 2017 – earning them a Fast Company Award for "Most Innovative Companies" in Fitness.

The functionality of the initial product since its release has largely been demonstrated through the various partnerships and case studies posted on the company's website. Indeed, these cases are quite high profile and impressive.[3] These partnerships and case studies include, for example, the San Francisco Giants and the United States Navy.

Another one of the case studies noted is with the U.S. Ski & Snowboard Association (USSA). Summarized details of the results include the following[4]:

Halo Neuroscience partnered with USSA's Olympic ski jump training program in order to "improve training efficiency and accelerate skill acquisition, Neuropriming was paired with a training program focused on improving the power and smoothness of athletes' jumps."

This partnership aimed to deal with the challenge that ski jump training requires maximizing the value of each run: *Because of time limitations (i.e. chair rides, setup time, unpredictable weather) and high risk of injury (i.e. speeds exceeding 100m per second), ski jump training is designed to get the most out of the fewest number of sessions.*

Results of the case study indicated that athletes using Halo Sport improved 45% faster than the control.

Going Forward

Wired magazine reporter Peter Rubin recently wrote about the Halo Sport 2 and other technologies that fit into a larger trend in the tech industry focusing on fitness recovery and, in this case, preparation.[5]

The technology in this case appears to show promise. The greater challenge may be to demonstrate safety and efficacy. This is very much the focus of Halo Neuroscience.

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[3] List of Case Studies and Partnerships listed on Halo Neuroscience website accessible at: https://www.haloneuro.com/pages/case-studies. Accessed on June 28, 2019.

[4] "Halo Sport improves jump force and technique of Olympic ski jumpers". Available at: https://www.haloneuro.com/pages/results-ussa. Accessed on June 28, 2019.

[5] Peter Ruben. "The Tech Industry's Latest Fitness Craze: Recovery". June 24, 2019. Available at: https://www.wired.com/story/tech-industry-latest-fitness-craze-recovery/. Accessed on June 28, 2019.