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DARPA takes new look at electrical brain stimulation to aid in learning

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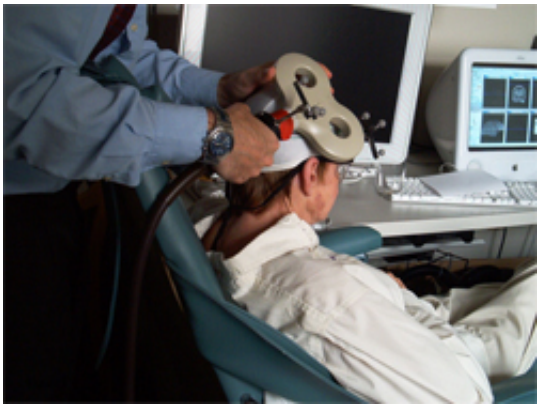

Image credit: Tmslab

(PhysOrg.com) -- New research going on in Albequerque, NM by a team of neuroscientists working for the Defense Advanced Research Projects Agency (DARPA) indicates that mild brain stimulation with electrical shocks, might in fact cause people to learn more easily.

The team, led by Vincent Clark, of the University of New Mexico, has been applying electrodes to the scalps of volunteers, and then giving them very mild electrical shocks while they play a battle simulation video game designed to teach soldiers to react properly in stressful conditions. Called transcranial direct-current stimulation (tDCS), the procedure employs a nine volt battery and electrodes connected to wet sponges affixed to the temples of game players to send just a few

milliamps of current through the skull and into the brain as they attempt to differentiate between friend and foe in dilapidated, potentially dangerous environmental conditions.

Two groups were tested, one received 2 milliamps while they played, the other just 0.1. The volunteers receiving the larger amount showed twice as much improvement as those that did not, which Clark says shows quite clearly how effective tDCS can be.

Applying electricity to the brain has a long and at times dark history. Doctors, psychiatrists and other researchers have known for hundreds of years that applying electrical current to the brain can cause changes; some good, some not so much. Electrical stimulation has been used to keep executed prisoners from twitching after death, to “help” patients overcome depression and more recently to help people with injuries or brain impairments to regain functionality. This history now colors any new research as fear and skepticism tend to get in the way of serious work. This is likely the reason that this new research is being done by DARPA, rather than an independent organization; it doesn’t have to answer to anyone except the DoD.

Because the amount of current is so small, volunteers report no pain, just a slight tingling sensation during the procedure, and afterwards can offer no real explanations as to why they performed better than they might have otherwise.

This research, and other studies like it, have set off both alarms and intrigue in certain quarters. Some worry people, such as college students will jump on the procedure as a means to help cram for exams, others wonder if electronic devices such as blue-tooth phones are emitting electricity that might help them learn; while others yet point out, very soberly, that no one really knows just yet what long-term effects people might have from exposure to something as simple as tCDS.

More information: tmslab.org/

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