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Effects of 10 Hz rTMS on the Neural Efficiency of Working Memory.

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Abstract Working memory (WM) has been described as short-term retention of information that is no longer accessible in the environment, and the manipulation of this information for subsequent use in guiding behavior. WM is viewed as a cognitive process underlying higher-order cognitive functions. Evidence supports a critical role for PFC in mediating WM performance. Studies show psychomotor processing speed and accuracy account for considerable variance in neural efficiency (Ne). This study compared the relative effects of active and sham 10 Hz rTMS applied to dorsolateral prefrontal cortex (DLPFC) on indices of Ne in healthy participants performing a WM paradigm that models the association between WM load and task behavior [Sternberg, S. High-speed scanning in human memory. *Science*, 153, 652-654, 1966]. Previous studies identified a relationship between diminished Ne and impaired WM across a broad array of clinical disorders. In the present study, the authors predicted there would be a main effect of stimulation group (STM) on accuracy (SCR) and processing speed (RT), hence, Ne. We observed a main effect of STM for RT without an effect on SCR; even so, there was a robust effect of STM on Ne.

Ph. Hug remark : wiki abstract on March 27, 2009

http://en.wikipedia.org/wiki/Transcranial_magnetic_stimulation

Transcranial magnetic stimulation (TMS) is a noninvasive method to excite neurons in the [brain](#): weak [electric currents](#) are induced in the tissue by rapidly changing [magnetic fields](#) ([electromagnetic induction](#)). This way, brain activity can be triggered with minimal discomfort, and the functionality of the circuitry and connectivity of the brain can be studied.

Repetitive transcranial magnetic stimulation is known as **rTMS** and can produce longer lasting changes. Numerous small-scale pilot studies have shown it could be a treatment tool for various neurological conditions (e.g. [migraine](#), [stroke](#), [Parkinsons Disease](#), [dystonia](#), [tinnitus](#)) and psychiatric conditions (e.g. [major depression](#), auditory [hallucinations](#)).