

Can We Promote Motor Learning In Speech Production Using tDCS?

January 22

Tuesday, 12:30 pm

Weekly Colloquium

Billings Building
Rosedale Conference Room



Speaker: Adam Buchwald, Ph.D.
Associate Professor of
Communicative Sciences and
Disorders
New York University

**Hosts: Rajiv Ratan, M.D., Ph.D. and
Susan Wortman-Jutt, M.S., CCC-SLP**

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Abstract

Over the past 10 years, non-invasive neuromodulation (and particularly tDCS) has been widely used to try to promote performance and stroke recovery in a variety of domains including motor control and language production. Over a similar time span, there has been great interest in whether motor learning within the domain of speech production relies on similar mechanisms as motor learning in non-speech domains. In our lab, we bring these two issues together by examining whether tDCS can enhance speech motor learning following in other domains. In this talk, I will present our preliminary findings from both unimpaired and impaired speech production that focus on determining whether and how tDCS can promote speech motor learning with the long-term goal of personalized rehabilitation for individuals with acquired speech impairment subsequent to stroke.

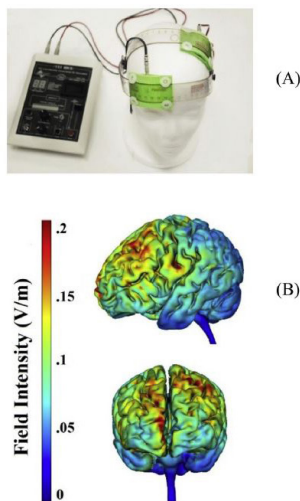


Fig. 2 – Electrode montage and current flow estimation for the Experiment. (A) depicts the electrode montage on a model head. (B) provides coronal and sagittal images of the output of the HD-Explore software for that montage on a standardized brain (see Datta, Baker, Bikson, & Fridriksson, 2011; Datta, Truong, Minhas, Parra, & Bikson, 2012 for details on the simulations).

Buchwald, A., Calhoun, H., Rimikis, S., Steinberg Lowe, M, Wellner, R., & Edwards, D. (2019). Using tDCS to facilitate motor learning in speech production: The role of timing. *Cortex*, 111, 274-285.

Buchwald, A., Falconer, C.*, Rykman A., Cortes M., Pascual-Leone A., Thickbroom G.W., Krebs H., Fregni F., Gerber L.M., Oromendia C., Chang J., Volpe B.T., Edwards D.J. (2018). Robotic arm rehabilitation in chronic stroke patients with aphasia may promote speech and language recovery (but effect is not enhanced by supplementary tDCS). *Frontiers in Neurology*, 9, 853.

Buchwald, A., Gagnon, B., & Miozzo, M. (2017). Identification and remediation of phonological and motor errors in acquired sound production impairment. *Journal of Speech, Language, and Hearing Research*, 60, 1726-1738.



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