The Moving Wave: Applications of the Mobile EEG Approach to Study Human Attention.

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Abstract

While historically confined to isolated research laboratories, electroencephalography (EEG) paradigms can finally be used in studies involving walking and other complex behaviors. This transition from isolated/immobile to unstructured mobile research can open new doors to understanding attentional processes as they occur naturally. However, there are current limitations in mobile EEG that must be overcome to achieve great quality signals. We examine the feasibility of mobile paradigms, including ecological validity, artifact correction techniques, and methodological considerations. We review several mobile studies related to attentional demands. This includes the replication of robust effects like the P3 in mobile paradigms in our lab, studies using walking, cycling, and dual tasking to study attention. We discuss how the mobile approach compliments traditional laboratory paradigms while it can add new dimensions to cognitive and attentional research. We discuss promising applications of portable EEG in workplace safety and other areas including road safety, rehabilitation medicine, and brain-computer interfaces.

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