Neural signature of balance

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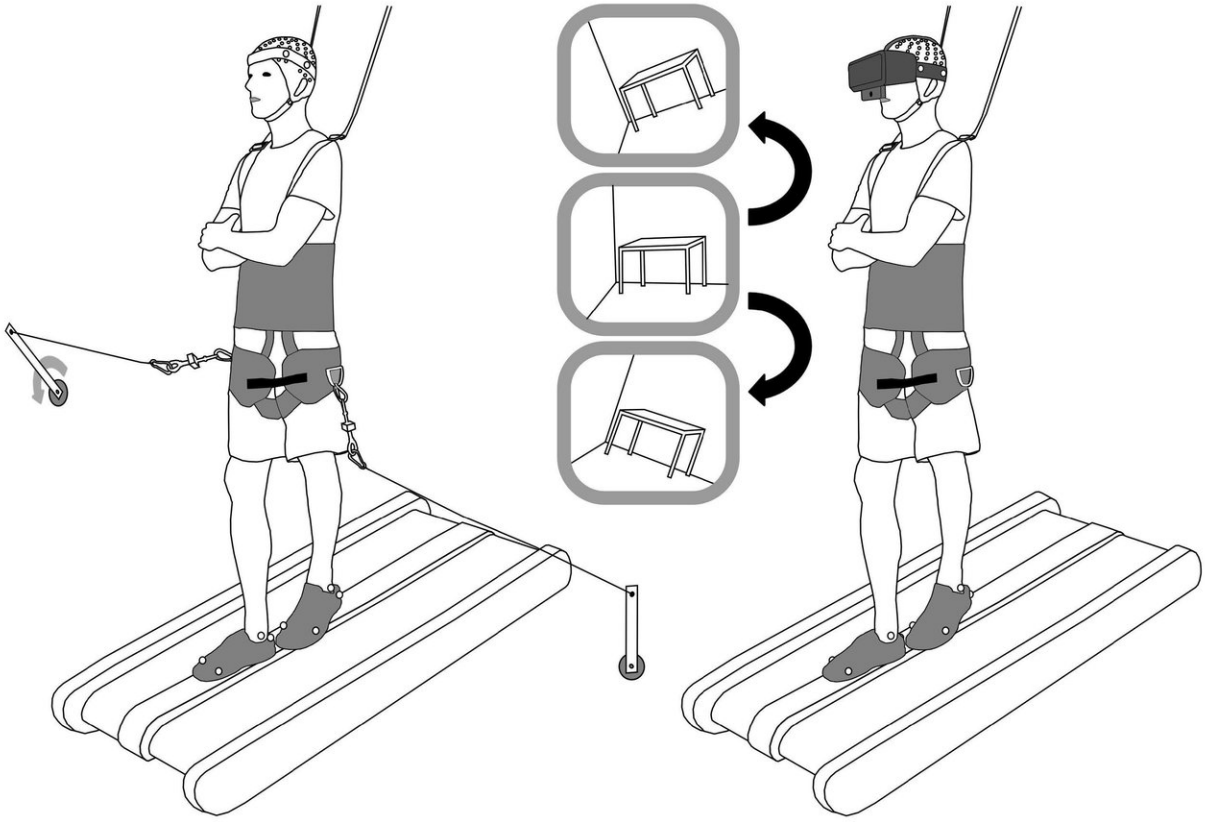

Credit: Peterson & Ferris, *eNeuro* (2018)

A study of young adults published in *eNeuro* demonstrates how the brain responds to disruptions in the body's balance. The research identifies a pattern of electrical activity that could be used to assess balance in patients with movement disorders such as Parkinson's disease.

Regaining balance after the body is acted on by external forces is a complex process that requires integration of the senses and muscles to remain upright. Older adults, in particular, rely on their vision to maintain balance, which can lead to falls as visual acuity declines with age.

Steven Peterson and Daniel Ferris used electroencephalography (EEG) and electromyography (EMG) to record electrical activity from the brain and muscles as participants walked or stood in place on a narrow beam mounted to a treadmill. The participants' balance was challenged by either pulling them from side to side or distorting their visual field with a virtual reality headset.

The researchers found that these balance disruptions elicited similar electrical responses in different parts of the brain, suggesting a common signature of balance maintenance in the healthy brain.

Training programs to improve balance in older adults or individuals with lower limb amputations should therefore keep in mind these underlying brain differences.

More information: Steven M. Peterson et al, Differentiation in Theta and Beta Electrocortical Activity between Visual and Physical Perturbations to Walking and Standing Balance, *eneuro* (2018). DOI: 10.1523/ENEURO.0207-18.2018

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