Press release

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Basic information

Name: Timo L. Kvamme Email: timo@cfin.au.dk Phone: +45 52666564

Department of: Clinical Medicine

Main supervisor: Morten Overgaard

Title of dissertation: Neurofeedback control of the neural correlates of multisensory perception

Date for defense 21st October 2021 at (time of day): 14:00 Place: Store Anatomisk Auditorium

Press Release (Danish)

Ph.D.-forsvar: Timo L. Kvamme

Et nyt Ph.D projekt fra Aarhus Universitet undersøger "neurofeedback", en psykofysiologisk process hvor hjerneaktivitet måles online og præsenteres til individet hvilket tilader dem at selvregulere deres egen hjerneaktivitet med resulterende effekter på adfærd og kognition. Projektet er udført af Timo L. Kvamme, som forsvarer hans afhandling d. 21/9/2021.

Forsvaret vil beskrive et forsøg hvor der anvendes real-time MEG-neurofeedback til at ændre ratioen af alpha aktivitet mellem de to hemisfære i parietal cortex. Vi viser at MEG-neurofeedback kan ændre multisensoriske oplevelser i sound-induced flash illusions opgaven, men at effekten afhænger af de forrige opgavers multisensoriske kongruens hvilket er konsistent med en Bayesiansk kausal inferens fortolkning af multisensorisk integration.

I en gennemgang af empiriske neurofeedback studier bliver den herskende opfattelse at neurofeedback kan tilvejebringe kausale forklaringer af sammenhængen mellem hjerneaktivitet og kognitive funktioner undersøgt. Vi argumentere for at denne inferens ikke altid er valid og at neurofeedback også indirekte kan påvirke kognitive funktioner via ændringer i andre former for hjerneaktivitet.

Omfanget hvormed at individer er bevidste om formåle med neurofeedback eksperimentet blev undersøgt igennem et nyt spørgeskema. Resultaterne viste at nogle forsøgsdeltagerne fik en delvis indsigt i formålet med eksperimentet hvilket stiller spørgmål til om kliniske neurofeedback studier kan gennemføres hvor den eksperimentelle standard om dobbeltblænding forekommer.

Forsvaret er offentligt og finder sted den 21/10/2021 at Tvillingeauditorium, Store Anatomisk Auditorium, Bygning 1232, Aarhus University, Wilhelm Meyers Allé 3, 8000 Aarhus C. Projektets titel er " Neurofeedback control of the neural correlates of multisensory perception" For mere information, kontakt venligst ph.d.-studerende Timo L. Kvamme, e-mail: timo@cfin.au.dk, telefon +45 52666564.

Bedømmelsesudvalg:

Professor Sarang Dalal (chairman and moderator of the defence)
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Press Release (English)

Ph.D.-defense: Timo L. Kvamme

A new Ph.D. project from Aarhus University investigates “neurofeedback”, a psychophysical process in which brain activity is measured in real-time and presented to the individual thereby allowing them to self-regulate their own brain activity with resulting effects on behavior and cognition. The project was carried out by Timo L. Kvamme, who is defending his dissertation on the 21/9/2021.

The defense will describe an attempt to use real-time MEG-neurofeedback to alter the ratio of alpha activity between the different hemispheres in the parietal cortex. We reveal that this MEG-neurofeedback training can alter multisensory experiences in the sound-induced flash illusion task, but that the effect depended on the prior trial’s multisensory congruency, consistent with a Bayesian causal inference account of multisensory integration.

In a review of empirical neurofeedback studies, the prevailing conception that neurofeedback can reveal causal links between brain activity and cognitive functions was investigated. We argue that this inference may not always be valid and that neurofeedback may also indirectly affect cognitive processes via changes in other brain activities.

The extent to which individuals are aware of the purpose of the neurofeedback experiment was investigated using a novel contingency awareness questionnaire. Results indicated that some subjects can gain a degree of awareness of the purpose of experimental purposes thereby questioning whether clinical neurofeedback studies can be performed in a double-blinded manner.

The defence is public and takes place on 21/10/2021 at Store Anatomisk Auditorium, Building 1232, Aarhus University, Wilhelm Meyers Allé 3, 8000 Aarhus C, 8000 Aarhus C. The title of the project is " Neurofeedback control of the neural correlates of multisensory perception ". For more information, please contact PhD student Timo L. Kvamme, email: timo@cfin.au.dk, Phone +45 52666564.

Assessment committee:

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