C.E.N.T. Computer Enabled Neuroplasticity Treatment

Cowley, Ben

2012


http://hdl.handle.net/10138/39245

Downloaded from Helda, University of Helsinki institutional repository.

This is an electronic reprint of the original article.
This reprint may differ from the original in pagination and typographic detail.
Please cite the original version.
University of Helsinki introduces Neurofeedback to Finland. Finland is heavily invested in cutting-edge brain science, yet it has never before had dealings with neurofeedback (NFB), either in research or clinical practice. However research on ADHD in Finland has developed strongly (e.g. Helenius et al., 2011, Gumienyk et al., 2004) and thus provides a good ground for the introduction of neurofeedback into Finland.

The CEN project will conduct a study on the effects of NFB on adult ADHD within Finland. Research is being conducted by the Cognitive Science Unit, Department of Behavioral Sciences, University of Helsinki, with NFB conducted by trained technicians supervised by qualified psychotherapists. Software is custom-built for the project, with games sourced from local companies.

**STUDY DESIGN**

The experiment aims to test the efficacy of neurofeedback for adults with either ADHD or ADD by randomized controlled clinical trial (RCT). The persistence of the treatment effects will also be tested with a follow-up study. Additionally we will study the need for other treatments may be substantial.

On par with more global estimates (Polanczyk 

Polanczyk et al., 2007), the prevalence of ADHD in Finnish 8-year-olds is estimated at 4% (DSM-III) (Almqvist, 2004), while among Finnish 16-18 year-olds it rises to 8.5% (DSM-IV) (Smalley et al., 2007). Indeed, given that in Finland medication therapy for ADHD is lowest among all Scandinavian countries (Zoég et al., 2011), Finland’s need for other treatments may be substantial. The CEN project will conduct a study on the effects of NFB on adult ADHD within Finland. Research is being conducted by the Cognitive Science Unit, Department of Behavioral Sciences, University of Helsinki, with NFB conducted by trained technicians supervised by qualified psychotherapists. Software is custom-built for the project, with games sourced from local companies.

**SOFTWARE**

A new software platform was developed by the Finnish company BLStream for the study, integrating OpenVibe platform’s signal analysis capabilities with a graphical user interface designed for the project. The platform gives the researcher or clinician the option to use different neurofeedback protocols and activities, for example different games or auditory content. The program records relevant background information on the patient’s state before each session and tracks the patient’s progress as the treatment proceeds.

The training itself is based on thresholds calculated from baseline measurements. Currently two NFB protocols are supported, theta-beta (the default option) and SMR, one of these is chosen by the trainer at the beginning of a session.

**REFERENCES**

Almqvist F. (2004). Aktiivisuuden ja tarkkaavuuden h¨air¨iot. Helsinki University, with NFB conducted by trained technicians supervised by qualified psychotherapists. Software is custom-built for the project, with games sourced from local companies.

```
FIG. 2 Timelineschematic of the CENT study.
```

```
FIG. 3 Screenshot of the software used in CENT
```

**RESEARCHERS**

Project Leader: Prof. Christina Krause Lead Researcher: PhD Ben Cowley Research Assistants: Mona Mossala, Kristina Juurima, Nyettal response, NFB ERP Psychiatric Consultant: Dr. Leo Kovarskis Psychological Consultant: Prof. Laura Hoxkanen

**PARTNERS**

Spinverse Oy

**Clinical**

**Mental Capital Care**

**YHFT**