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A Longitudinal Study Assessing an IT-supported Neurological Feedback in Obesity Intervention for Children and Adolescents' Emotional Self Control

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Purpose

A mobile health information system (MHIS) is designed for obese children to help controlling their emotions in concern of their eating habits. Consistent with prior work focusing on adults (Stephan 2012), neurological biofeedback is used to identify food stimuli that are able to support the patient to overcome the strong impulse of uncontrolled eating.

adapted from http://www.google.com/intl/all/nexus/7/

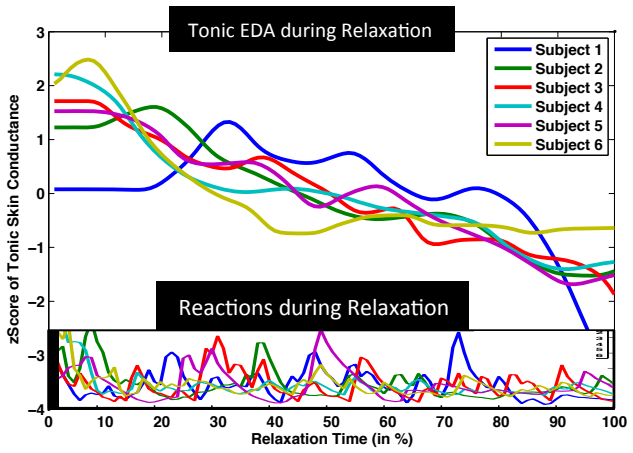
Method

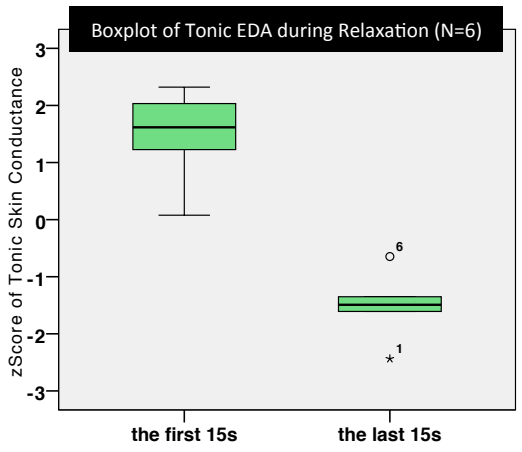
A pilot study with 12 obese children will be conducted for exploratory purposes.

Study plan for 2 x 6 obese 11-13 year olds	**Intervention**	**Control**
Week 1: Consultation		
(1) Identification of critical food stimuli by questionnaire, cortisol, EEG and electrodermal reactions (EDR)	**X**	**X**
(2) T0 measurement of eating attacks	**X**	**X**
Week 2: Consultation		
(1) T0.5 measurement of eating attacks	**X**	**X**
(2) T0.5 measurement of critical food stimuli by cortisol, EEG/EDR	**X**	**X**
(3) Setting up PathMate app with critical food stimuli	**X**	**–**
Weeks 2 – 4: Daily self-regulation training with PathMate App	**X**	**–**
Weeks 4 & 8: Consultations		
(1) T1/2 measurement of eating attacks	**X**	**X**
(2) T1/2 measurement of critical food stimuli by cortisol, EEG/ EDR	**X**	**X**

Pretest Results

A pretest shows that obese children are able to successfully perform self-regulation tasks.





Electrodermal Activity (EDA), N=6	**Difference?***
Mean of Tonic EDA (first vs. last 15s)	**yes**, p = .008
Sum of Reactions: (first vs. last 30s)	**yes**, p = .028
Freq. of Reactions (first vs. last 30s)	**no**, p = .206

6 x linear regression of EDA	
beta Mean/SD	- 0.88 (.15)
t-value Mean/SD	251 (167)***
R^2 Mean/SD	.80 (.24)

**Wilcoxon signed-rank test was used and a criterion for phasic amplitudes of .01 µSiemens.*

Conclusion

- The MHIS is expected to support the therapists and patients by an increased resolution of therapeutic data (e.g. the degree of arousal related to a specific food stimuli).
- MHIS-supported emotional self-regulation training with critical food stimuli is expected to positively correlate with controlled eating behavior.
- MHIS usage is also expected to be positively related to additional medical outcome parameters such as body mass index (BMI).

Literature: Stephan (2012), The influence of biofeedback on eating behavior, physiological reaction to stress and the ability to relax in individuals with obesity, Dissertation, Universität Tübingen

Partners

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