

## HEAR-ECO E-newsletter July-December 2020

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### I ntroduction



### Network-wide virtual update event

All project supervisors and students met on Teams to discuss the combinational studies

**Date:** 8<sup>th</sup> September and 29<sup>th</sup> October 2020

**Places:** Teams virtual meeting

**Involved:** All students and supervisors

In the update event, which took place in three different sessions, all the ESRs presented their latest work on the combination studies (CS), as well as their individual progress. The first session was on 8<sup>th</sup> September 2020. Sergio and Tirdad presented the results for CS3, where simulated rooms were used to assess the effects of reverberation on listening effort using EEG. The second and third sessions took place on 29<sup>th</sup> October 2020. In the morning session, Defne and Patrycja gave their latest results for CS2, revealing how memory and reward are reflected in the new pupillometry methods that measure listening effort. In the afternoon session, Beth and Hidde talked about CS1 and showed their respective results on how listening effort with and without a social manipulation are reflected in the cardiovascular and pupil changes. Overall, all three sessions raised some interesting discussions among the supervisors and ESRs, which were very useful for further improving the work.

## **New Publications**

The publications resulting from the groundwork of Tirdad Seifi Ala, and Bethany Plain are now available online! Tirdad’s work explores how EEG Apha oscillations and pupil dilation reveal listening effort in hearing-aid users while listening to continuous speech in babble noise (doi: 10.1371/journal.pone.0235782). Bethany’s work implements the measurement of pre-ejection period reactivity in a speech-in-noise task, where listening difficulty and monetary reward were manipulated (doi: 10.1097/AUD.0000000000000971). Hidde Pielge’s paper describing the effects of social factors on listening effort also got accepted with minor changes for publication! Stay in tune for the announcement and details of this publication through our social media accounts. The results of these studies are steps forward towards using a variety measures to objectively quantify listening effort.

## **Listening effort and pupillometry experiment**

Between 15<sup>th</sup> October – 3<sup>rd</sup> December 2020, Defne Alfandari Menase ran a psychological experiment utilizing pupillometry at the Eriksholm Research Centre. 25 mild-to-moderately hearing impaired adults participated in the experiment, while wearing hearing aids. A variety of questionnaires probing mental states, such as motivation, and psychological traits, such as need for cognition, were used.



Test hearing aids were individually programmed for each patient by the research clinicians

Two research clinicians from Eriksholm, who were trained in using pupillometry, assisted in guiding the participants through the experiment. The experimental sessions took place in the “Pitch lab”. The lab was sanitized and ventilated between each experimental session in accordance with the covid-19 guidelines. Each patient was shortly introduced to the workings of the eye tracker camera. Patients listened to speech in babble noise while their pupil size was recorded. The experiment also included a reaction time measure probing the psychological state of the participant. The last experimental session was run on 4<sup>th</sup> December 2020, before the covid-19 restrictions in Denmark were tightened. The results of the experiment contribute to our understanding of how the mental state of hearing impaired patients is reflected in the pupillometric measures of listening effort.

## **Federation of European Neuroscience Societies (FENS) Conference**

In July 2020, Tirdad participated in Federation of European Neuroscience Societies (FENS) conference, which was originally supposed to be held in Glasgow, UK. Due to the COVID-19 pandemic, the organizers decided to hold the meeting virtually. Tirdad said: “It was the first time I have participated in a virtual conference. It was a strange feeling, as you don’t have regular interactions as you would in a physical conference. However, the organizers did their best to keep the quality of the conference and I could listen to some

interesting research going around”. Tirdad also presented a poster titled: “EEG evidence for the interaction between demand and motivation on listening effort”. In this poster, he talked about how people spend more effort when they are offered monetary reward and are more motivated.

## **Eriksholm Calibration Workshop**

**Date:** 18<sup>th</sup> September 2020

**Place:** Eriksholm Research Centre

**Involved:** Sergio Aguirre, Defne Alfandari Menase, Patrycja Książek, Lars Bramsløv



**Lars Bramsløv underlined the importance of daily calibration checks.**

The Eriksholm Calibration Workshop targeted colleagues with experience and expertise in acoustic calibration, in addition to those preparing an experiment with acoustic stimuli involved. It had two aims. The first was to introduce basic concepts in acoustics and signal processing, as well as to present the technical aspects of acoustic calibration such as microphone positioning. The second was to share calibration methods from various experimental setups and to discuss different ways of calibration, based on the sound devices that were used.

used.

As developing innovative conditions for testing hearing aids requires understanding and calibration of the acoustic lab scene, two of the ESRs were involved in the organization of the workshop and took the opportunity to share their knowledge and experience from the project so far. Sergio Aguirre gave a lecture on theoretical and technical concepts of acoustic calibration, a tutorial on how to set the microphone during calibration, as well as a talk on calibration software for his own experimental setup; Patrycja Książek presented a setup from her combinational study; Lars Bramsløv gave a lecture on basics in acoustic calibration and signal processing, introduced the PULSE system and presented his own calibration setup. Here, you can read a few lines about the event from the ESRs involved in organization:

*Sergio: It was a great opportunity to exchange knowledge and reassess our methods and procedures. In addition, the presentations and demonstrations carried out were good training for technical communication for a wide audience.*

Patrycja: *It was a valuable exchange of knowledge in acoustic calibration. I was happy to share my experience and thoughts with people with greater expertise in the topic than myself and to learn even more from them.*

## **HEAR-ECO students and supervisors organized a bespoke workshop at Ghent University**



**Bethany and Sergio showed the placement of electrodes**

On the 14<sup>th</sup> and 15<sup>th</sup> September 2020, four members of the HEAR-ECO team (Hidde Pielage, Bethany Plain, Adriana A. Zekveld, Michael Richter) were involved in running a bespoke workshop about psychophysiological measures for a group of PhD students at Ghent

University. Although initially planned to be a physical workshop in Ghent, due to COVID19 and travel restrictions, the event was adapted to be completely online. 28 people participated, including the organizers.

This event focused on introducing cardiovascular and pupillometry as measures of the autonomic nervous system. The theoretical basis, experimental application of both measures and live demonstrations were included. HEAR-ECO supervisors (Michael Richter and Adriana Zekveld) prepared and delivered theoretical introductions to the systems and measures. Then, the ESRs (Bethany Plain and Hidde Pielage) demonstrated some more practical aspects of the measures. Bethany provided a live demonstration of electrode placement for cardiovascular data collection and Hidde prepared and provided interactive, hands-on training in signal pre-processing for pupillometric data.

Both days of the workshop were very well received. The participants seemed to be actively engaged and enthusiastic throughout, asking many relevant and interesting questions. We received plenty of positive comments at the end of the workshop. For example, one of the participants commented: “Thanks [organisers] for organising such a great course! I wish I had followed a course like this at the beginning of my phd...”. For the HEAR-ECO ESRs involved in the workshop (Hidde and Beth), it was great to be part of such an event and to be able to support other students based upon our experience with cardiovascular and pupil measures. Such workshops also promote networking and provide invaluable experience in communicating our work and methods to peers.

## **Stress Management workshop**

**Date:** 21<sup>st</sup> October 2020

**Places:** Eriksholm Research Centre and Teams meeting app

**Involved:** Bethany Plain, Defne Alfandari Menase, Hidde Pielage, Tirdad Seifi Ala, Patrycja Ksiazek, Sergio Aguirre, Hamish Innes-Brown

All ESR's participated in a stress management workshop that was led by Lise Terp. The workshop focused on analytical perspectives on managing stress

and interpersonal conflict. In addition, the ESRs were taught practical, stress-relieving techniques, such as breathing exercises, to implement during moments of stress.



The content of the workshop was tailored for the early stage researchers

## **Audiological Research Cores in Europe (ARCHES) Meeting**

**Date:** 21<sup>st</sup> October 2020

**Places:** Zoom virtual meeting

**Involved:** Sergio Aguirre, Defne Alfandari Menase, Adriana Zekveld

Defne and Sergio presented their work orally at the annual meeting of the Audiological Research Cores in Europe in oral presentations. ARCHES is “a European network of research groups focusing on hearing science, with the aim to stimulate networking, interaction, and scientific collaboration between researchers in the auditory field”. This year the meeting was organized by the Hearing Systems group at the Technical University of Denmark. There were presenters from KU Leuven, University Hospital Zurich, Hoerzentrum Oldenburg, Laboratoire des Systèmes Perceptifs (Ecole Normale Supérieure), Amsterdam UMC, University Medical Center Groningen, University of Nottingham, and University of Salamanca. The meeting started at 8.30 in the morning and continued until 18.00 in the evening. After 18.00, Defne and Sergio stayed at the online platform for virtual beers and games.

Sergio:” Exchanging thoughts with top researchers in my field in an informal meeting was an invaluable experience”

Defne: “Although the meeting was online, many of the participants had their cameras on during the meeting. I could see the face expressions of others as I presented. After my presentation I received interesting questions relating to the use of pupillometry as a diagnostic tool”.

**Upcoming in the HEAR-ECO calendar:**

HearTrain-3	<b>Dates:</b> January 2021
	<b>Location:</b> Online
	<b>Information:</b> Hear-train-3

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