Contribution ID: **29** Type: **Poster**

Dissociating Contributions of Prediction and Trial-Level Adaptation Using High-Field fMRI and Population Receptive Field Modeling.

Wednesday, July 20, 2022 11:00 AM (20 minutes)

To make sense of the intricate, noisy, and often incomplete soundscape of our dynamic world, human listeners continuously use contextual information to form predictions about future states while also adapting to past sensations. While extensive research supports the relevance of both prediction and trial-level adaptation to aid effective neural processing of sounds, differentiating between the two remains challenging. Prediction and adaptation are often correlated, making events that are surprising the same events that - because of their changes in low-level properties - cause a release from adaptation. The interplay between prediction and adaptation has been previously investigated using (human non-invasive) electrophysiological measures, but the cortical mesoscopic circuitry underlying these mechanisms is still unclear. Here we test the relative contributions of prediction and trial-level adaptation by presenting pure tones probabilistically sampled from two Gaussian distributions. We measure high resolution (sub-millimetre) functional magnetic resonance imaging at ultra-high field (7T fMRI) to observe layer-dependent effects of prediction and adaptation within the auditory cortex. We model single voxels using: 1) a low-level tuning model (using population receptive field modelling); 2) a prediction model (adopting a multilevel hierarchical Gaussian filter) and 3) a trial-level adaptation model (with long-term effects). This investigation will allow us to gain insights of where (and in what layer) prediction and adaption are integrated within the auditory cortex. In the future, we plan to use the same paradigm employing magnetoencephalography (MEG) to complement the high spatial resolution of fMRI and to understand the temporal dynamics of this interplay.

Primary authors: Mr VAN HAREN, Jorie (Maastricht University); Prof. DE LANGE, Floris (Donders); Dr DE MARTINO, Federico (Maastricht University)

Presenter: Mr VAN HAREN, Jorie (Maastricht University)

Session Classification: Poster Session 2 (coffee break)