# THE CEREBRAL BASIS OF HEARING VOICES IN HEALTHY PERSONS

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**Background:** Auditory hallucinations (AHs) are experienced by around 70% of schizophrenic patients and 4-15% of healthy persons. In the first step of this project, we showed that non-clinical individuals with higher proneness to experience AHs showed higher levels of spirituality compared to those with low proneness to AHs. We also found that AHs, together with depression and anxiety – but not spirituality – discriminated between individuals above and below psychosis risk. In a different study, we found that transcranial magnetic stimulation (TMS) applied over the right/left hemisphere enhanced the correct localization of a voice (presented within a noise stream) presented either in the left or in the right ear, but only in male healthy participants with a low/high proneness to AHs, respectively.

**Aims:** The following step of the project aims to shed light on the hemispheric imbalance associated with AHs and their emotional valence, and possibly with spirituality, by recording electroencephalography (EEG) in a healthy sample during the presentation of voices to the left and right ears.

**Methods:** Healthy participants with low vs high levels of spirituality and with low vs high proneness to AHs (*N*=31) were presented with auditory stimuli (voices) with positive (happiness) and negative (fear) valence in a dichotic listening task (i.e., voice presented in the left/right ear) and were asked to judge the emotional tone of the voice heard, during EEG recording.

**Preliminary Results:** The subgroup with high spirituality and low AHs showed a faster N1 event-related potential (ERP; time window: 50-170 ms) over the auditory cortex compared to the other subgroups. A following ERP (Sustained Negativity; 300-870 ms) revealed a lower amplitude in the subgroup with low spirituality and high AHs compared to the subgroup with low spirituality and low AHs, only when positive stimuli were presented in the right ear. The amplitude of the Late Positivity ERP (880-1530 ms) was higher in the left compared to the right hemisphere in the subgroup with low spirituality and low AHs, whereas in the subgroup with high spirituality and high AHs the same comparison between hemispheres was significant only when auditory stimuli were presented in the right ear. This complex pattern of results suggests that not only the spirituality level, but also the valence and the side of the perceived voice (left vs right ear) affect the cortical activity related to voice hearing.

**Keywords:** Auditory Hallucinations (AHs), Voice hearing, Spirituality, Event-Related Potentials (ERPs), Valence

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