

## Information letter to participants

The title of this research is :

« Investigating the shared neural foundations of speech and music perception »

The principal investigator and promoter of this study is Prof. Shihab Shamma and the recordings will be conducted by Giorgia Cantisani, researcher at Laboratoire des Systèmes Perceptifs of the Département d'Études Cognitives at École normale supérieure.

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**Aim of the study:** *Music and language* are forms of communication special to humans, and their perception and production underly remarkable abilities of our brain. While no particular language is encoded at birth, our brains have evolved to rapidly learn the statistics and rules of speech and music that are specific to our environment. Previous research suggested that the low-level speech and music acoustic signals are transformed into high-level concepts by means of a hierarchical neural system. However, despite evidence for *shared and parallel mechanisms* for speech and music processing, the two phenomena have been largely investigated separately. In this project, we will investigate the shared neural mechanisms of speech and music perception in ecologically-valid scenarios by analyzing behavioral and multivariate neural data with signal processing and machine learning methods. Specifically, we will probe speech and music processing simultaneously by considering the case of *sung speech* perception, a scenario engaging both processes.

**Study procedure:** During the study, you will be placed in a soundproof booth after preparation for the session. A cap with 64 electrodes is placed on your head to collect real-time electrical activity from your brain. For each electrode, a small amount of electrolyte gel is applied to the skull to facilitate signal transmission. This gel is washed off with water at the end of the experiment. This technique, called EEG, is absolutely painless and safe for you. During the experiment, you will listen to speech and music samples through headphones, and you will be able to adjust the volume yourself. You will be asked to listen passively to the stimuli without moving and to answer short questions at the end of each excerpt to qualitatively measure your attention level.

**Duration of the study:** The study takes place in a 3.5-hour session. You will be compensated for your participation with fifty euros (50€). You can interrupt the procedure at any time, and you will still receive the full compensation.

Please note:

- The experiment you are about to undergo does not put you in any particular danger
- The experiment has no side effects
- You are free to accept or refuse to take part in the experiment
- Your consent does not relieve the research organizers of their responsibilities. You retain all your rights guaranteed by law.
- You can stop your participation at any time, if you wish, without incurring any responsibility.