



Internship proposal for

Exploiting the somatosensory function in hearing impaired (HI) subjects for understanding and rehabilitating the perceptuo-motor loop in speech communication

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Scientific description: The improvement of hearing and speaking ability in HI subjects is crucial for smooth communication. A central assumption in the present project is that those improvements can be achieved not individually, but interactively in both functions. As a matter of fact, recent neurocognitive studies involving our research group showed that orofacial somatosensory inputs can play a key role in the interaction between speech production and perception. It is thus expected that orofacial somatosensory inputs could intervene significantly in the improvement of both hearing and speaking in HI subjects with and/or without hearing-aids.

Purpose: The current project will examine the effect of orofacial somatosensory function in speech perception and speech production in HI subjects with and without hearing aids, and the relationship between the somatosensory effect and speech abilities in individual subjects, in relation with their handicap.

Methods: The experimental methodology is based on a series of original paradigms developed in GIPSA-Lab, using a robotic device (Figure 1) enabling to produce somatosensory stimulations on the face in a precisely controlled way both in space and time. The role of such stimulations for modifying and hopefully enhancing speech perception and speech production will be explored in combination with other modalities (audition and vision).

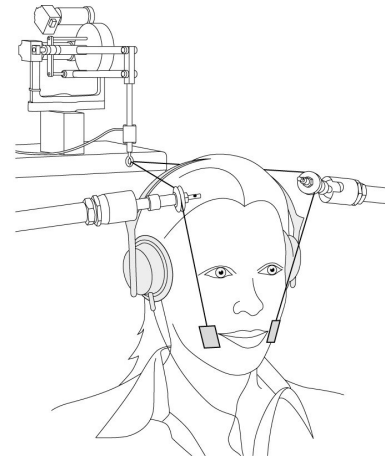


Figure 1

Outputs: The results will shed very interesting light on the cognitive processing of speech and development in the human brain. The student will learn an original and sophisticated technique associated with the use of the Phantom system. The internship will combine psychophysical experiments and use of various software for piloting the Phantom, driving the experiment and analysing the results with statistical tools. This experiment, if successful, could drive towards further studies and possible developments for speech processing and speech learning. The project is supported by the multi-laboratory project (Comm4Child) funded by EU Horizon 2020. After this internship, a PhD position can be available either by continuing the same topic or on a different topic related to auditory impairment and speech communication in other European labs in the project.