

Early hearing deprivation limits the children's access to environmental inputs, with disruptive outcomes on their neurocognitive development. It is associated with deficits in explicit (i.e. phonological loop) and implicit learning mechanisms, however, their specific weight, as well as their interaction on language and literacy learning, is yet to be defined. Implicit sequence learning (ISL) is the mechanism designated to automatic and non-aware detection and process of structural regularities underlying temporal patterns and/or sequences of stimuli. It is functional in the earliest stages of linguistic development, as studies indicate its close association with language and literacy acquisition. Dysfunctions in ISL result in deficiencies in oral and written language learning observed in various clinical populations. With the advent of new-generation auditory devices (i.e. cochlear implants, CIs) it is now possible to explore the neurocognitive effects of early hearing loss and its recovery on the development of the children's cognitive functions. Research in this field has two main aims: enriching the basic knowledge about the learning process and identifying innovative and effective pathways for neurocognitive therapies. This project fits in perfectly with these aims. Its foundations lay on the studies at the forefront of the investigation of auditory deprivation's effects on sequence learning in deaf children with CIs and include the efficacy assessment of innovative training. The training consists of the beta version of a serious game targeting implicit and explicit sequence learning mechanisms. The expected results are promising, since improving these skills could also be beneficial to the related cognitive functions, like language and literacy.