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Nap modulation of cross-sensory audio-tactile skills in visually impaired and sighed infants: an EEG study

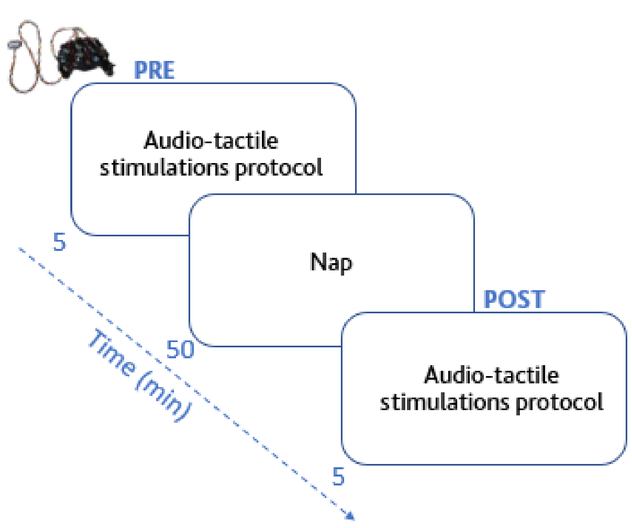
H. Vitali[1,2], C. Campus[1], V. De Giorgis[3], S. Signorini[3], G. Papalia[3], M. Fasce[3], F. Morelli[3], M. Gori[1]

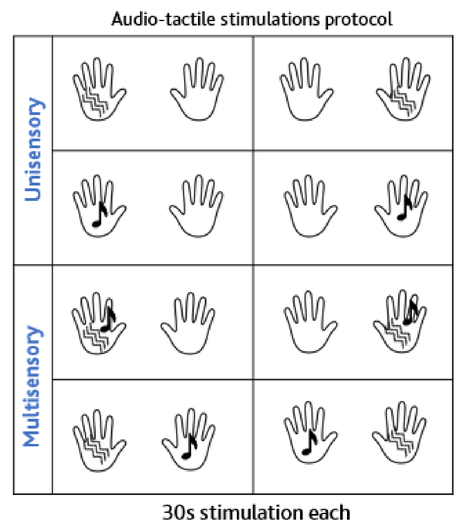
[1]Istituto Italiano di Tecnologia, Genova, Italy. [2]University of Genova, Genova, Italy. [3]IRCCS Mondino Foundation, Pavia, Italy.

BACKGROUND

In the first years of life, vision is crucial in the multisensory representations of the body and the external world. Vision also shapes the typical development of neural networks[1]. Thus, the absence of visual experience in early life impacts the weight we give differently to our senses[2] and the development of brain rhythms[3]. Moreover, the information decodes during wake were reprocessed during sleep, suggesting that the absence of one sensory input influences both waking and sleep neural processing[4]. However, **how multisensory signals are reprocessed during sleep and how sleep influences the awake neural response in VI and sighted infants was not investigated.**

METHODS





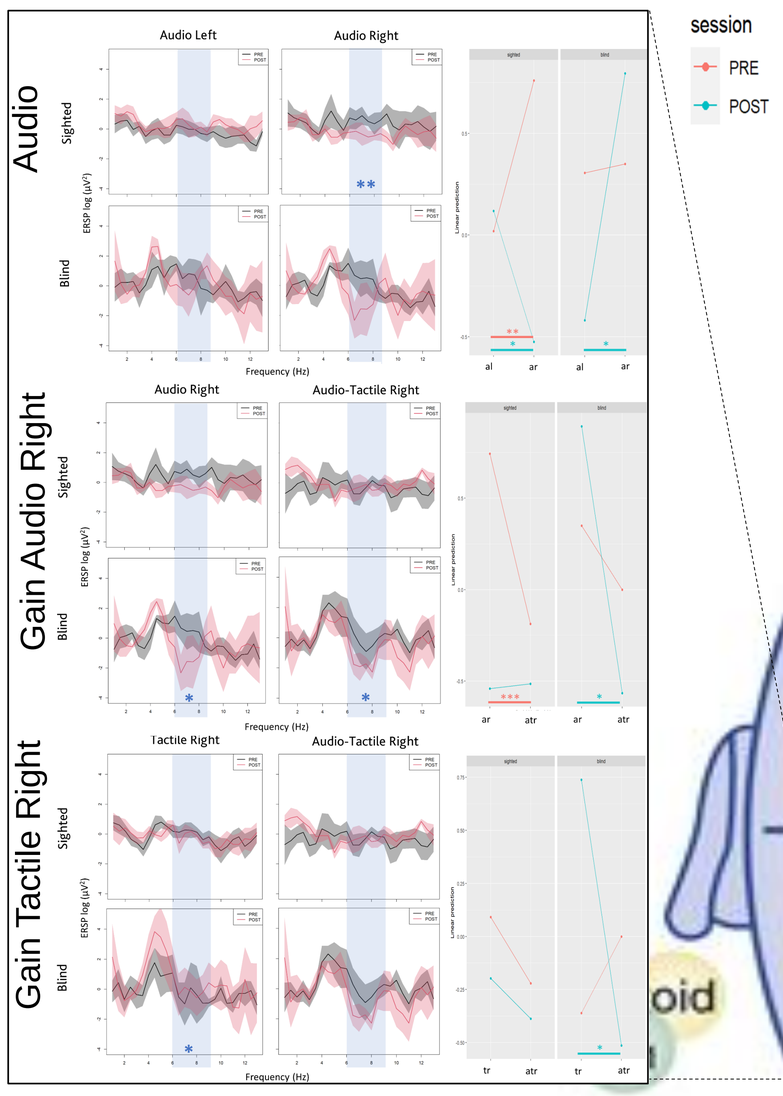
Video-EEG recording of

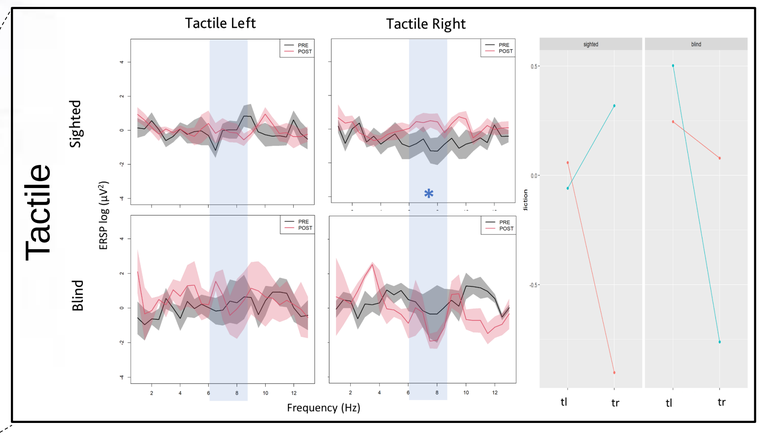
- 9 sighted infants (4F)
- 5 visually impaired infants (2F)

EEG recordings were then processed by EEGLAB to compute spectral analysis and specifically the alpha ratio (6-9Hz).

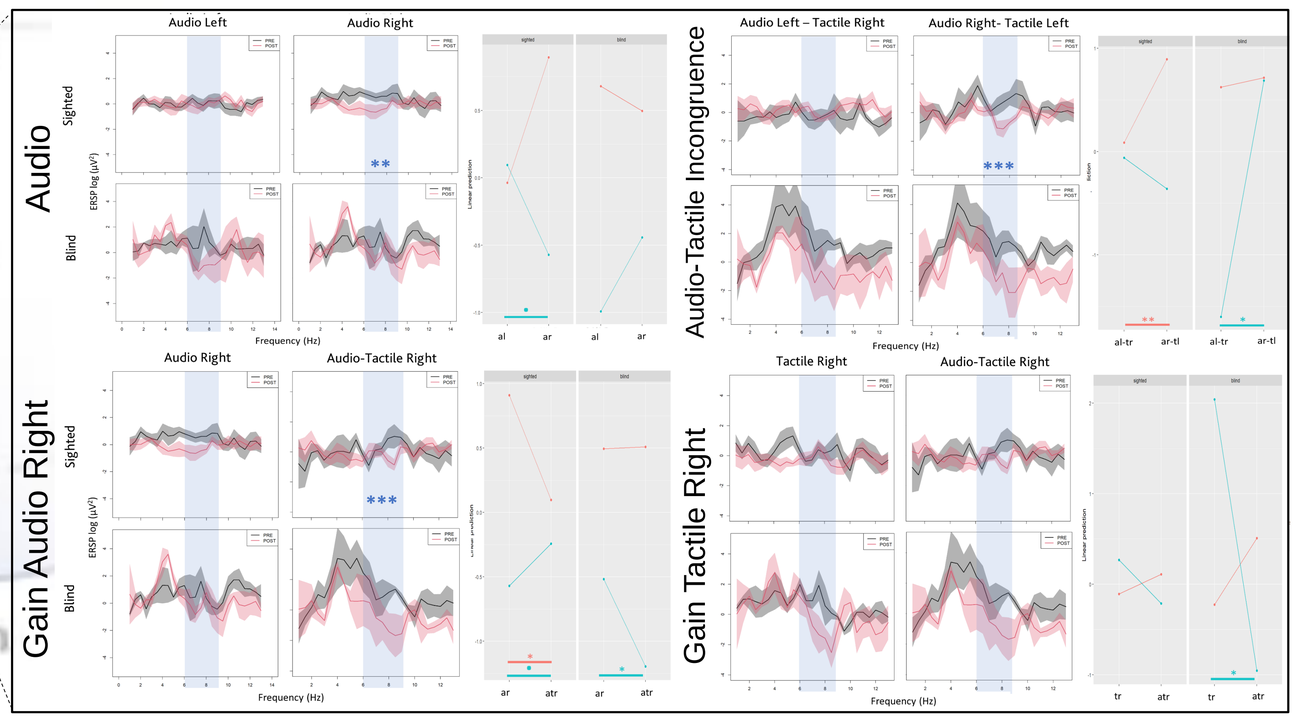
RESULTS

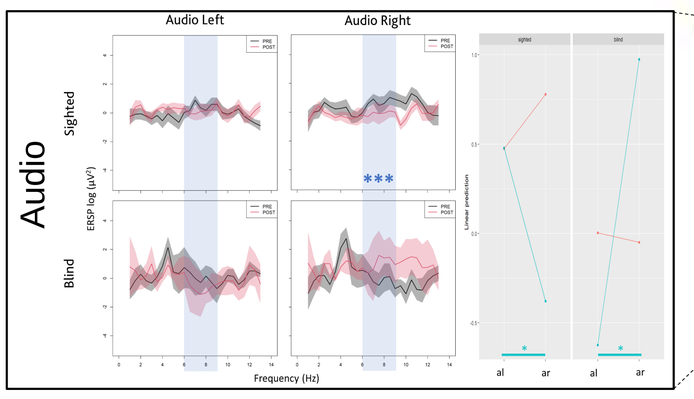
- The unisensory audio and tactile stimulations involved the temporo-posterior and central areas respectively, considering the EEG alpha rhythm (6-9Hz).
- The multisensory audio-tactile stimulation mainly involved associative area (Parietal).
- Differences in the pre-post sessions were found both in sighted and visually impaired infants.





- Specifically, in the post session audio stimulation provoked a higher modulation of alpha rhythm in sighted infants. Conversely in the post session tactile stimulation provoked a higher modulation of alpha rhythm in visually impaired infants.





CONCLUSION

In agreement with the literature[2], our results suggest that VI infants weigh more on tactile than auditory stimuli, differently from sighted ones. Indeed, sleep modulates different senses between groups. This affects also how infants responds to multisensory stimulations.

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