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PSYCHOPHYSICS & MUSIC PERCEPTION

Spectrotemporal Representation of Sound along Auditory Pathway of Musicians with and Without Absolute Pitch: Pilot Study

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Introduction

Absolute pitch, defined as the ability to name musical notes without external references, is a phenomenon which serves as a relevant model for understanding the interaction between environmental and innate factors on the development of linguistic, sensory and cognitive skills.

Objectives

The aim of the study was to compare musicians with and without absolute pitch regarding spectrotemporal representation of sound along auditory pathway.

Methods and Materials

Participants comprised 15 adults (mean age = 25,40 yearold ± 2,69) with normal results on basic audiological assessment, Dichotic Digit Test, Compressed Speech Test, and Gaps in-Noise Test. All participants were Music graduates or undergraduates and played music professionally.

Absolute Pitch Group n=06

Non-Absolute Pitch Group n=09

Music graduates or undergraduates

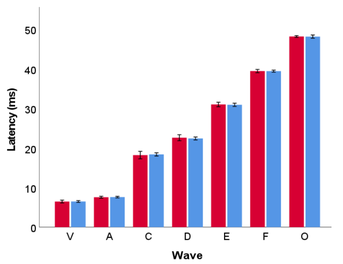
mean time of musical training:
13,60 years ± 5,88
played music professionally

None of the participants presented history of language, learning, or auditory complaints. After obtaining normal results in peripheral and central auditory tests, subjects underwent the Frequency-Following Response (FFR) with speech stimulus. Groups were compared regarding parameters of frequency and time domains.

Results

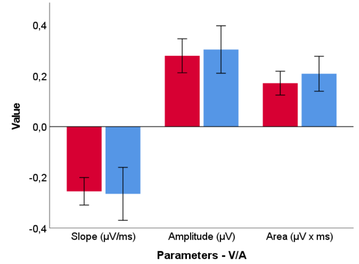
No statistically significant diferences were observed between groups for all FFR parameters. These results support the theory that absolute pitch is more influenced by cognitive aspects instead of sensorial processing.

Time Domain



Mixed model effects
Group – p = 0.919
Group x Wave – p = 0.967

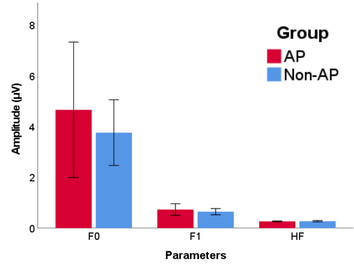
Time Domain



Student's T test

All comparisons – p ≥ 0.369

Frequency Domain



Student's T test

All comparisons – p ≥ 0.404

Conclusion

Musicians with absolute pitch were similar to musicians without absolute pitch regarding spectrotemporal representation of sound along auditory pathway. Thus, mechanisms underliying absolute perception of musical notes may be more related to brain structures primarily associated with cognitive functions (e.g., dorsolateral prefrontal cortex) than those primarily associated with basic auditory processing (e.g., auditory cortex).

References

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