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PSYCHOPHYSICS & MUSIC PERCEPTION

Auditory temporal resolution and backward masking in musicians with absolute pitch.

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Introduction

The neural processes underlying musicians' ability to identify musical notes without a reference, known as absolute pitch (AP), are not fully understood. While a perceptual subprocess is acknowledged, the role of auditory skills like temporal resolution and backward masking remains unclear.

Objectives

This study aims to investigate the relationship between absolute pitch and temporal resolution, as well as backward masking.

Methods and Materials

Experiment 1
Temporal resolution

Young professional musicians (18-28 yo)
No history of language, communication, cognition, or hearing complaints
Normal hearing thresholds and Word Recognition Index

Test procedure: Gaps-in-Noise test (Musiek et al., 2005)

Absolute Pitch Group n=09

Non-Absolute Pitch Group n=10

Experiment 2
Backward Masking

Young professional musicians (21-30 yo)
No history of language, communication, cognition, or hearing complaints
Normal hearing thresholds and Word Recognition Index

Test procedure: Backward Masking Test (Filippini et al., 2022)

Absolute Pitch Group n=08

Non-Absolute Pitch Group n=07

Results

Although no statistically significant differences were found between groups in both auditory tests, strong correlations were observed between the Gaps-in-Noise test and the pitch naming test, accounting for 20-36% shared variance. No correlations were found between the backward masking and pitch naming tests.

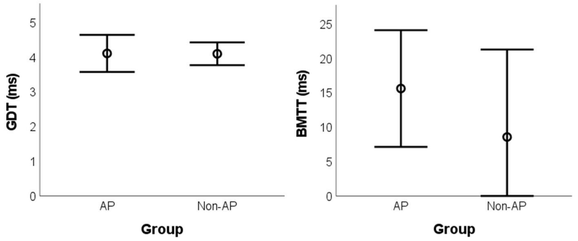
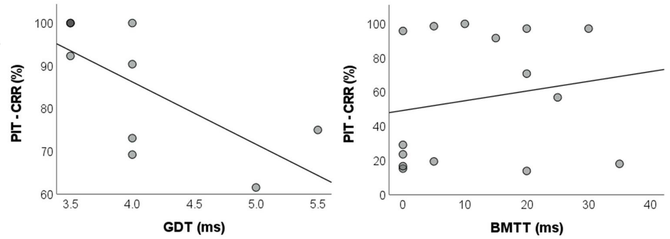


Figure 1. Performance on GIN and BMT for the AP and Non-AP groups

Figure 2. Correlation between BMT, GIN, and absolute pitch measures



Conclusion

Temporal resolution, but not backward masking, is associated with absolute pitch. These findings suggest that not all aspects of auditory perception contribute to the perceptual subprocess. Possible explanations include the overlap of brain areas involved in temporal resolution and absolute pitch, absent in backward masking, and the importance of temporal resolution in analyzing the temporal fine structure of sound for pitch perception.

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