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# Abstracts

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# What Influences a Musician's Sound Imagery? The Role of Working Memory, Aural Skills, Absolute Pitch and Other Proficiencies

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## Background

Aside from the skills required to play their respective instruments, all musicians share particular aural skills, depending on their instrument, genre and their musical intrepretations. Such aural skills include, but are not limited to, analytical hearing, sound imagery, intonation or playing by ear. In this study, the former two skills are investigated in more depth and connected to other skills of interest.

## Aims

Using path analysis, we investigated how various skills are connected and causally affect each other. For example, we hypothesized that working memory skills would predict performance in musical imagery because both tasks rely on the encoding, retaining and comparing of melodies. Mental rotation was hypothesized to predict musical imagery and analytical hearing as the two latter skills often rely on a kind of "musical mental rotation" when the musical material is transformed in one's mind.

## Method

Participants were 55 music students (30 female, M(age) = 23.1 years). Eight participants possessed absolute pitch. Participants had played their main instrument for M = 13.5 years and showed a large variety in instruments.

The following tests were included in the path analysis: the Notation-Evoked Sound Imagery test (NESI; Wolf, Kopiez, & Platz, in prep.), the Musical Ear Training Assessment (META; Wolf & Kopiez, in press), the Gold-MSI Melodic Memory Test (MMT; Harrison, Musil, & Müllensiefen, 2016), a Working Memory test (WM; Sander, 2005) and the Mental Rotation Test (MRT; Peters et al., 1995).

## Results

Good fit indices were achieved ($Chi^2$ was n.s., CFI = 1.00, SRMR = .03). The three most relevant standardized paths were identified between NESI and META (0.69), from MMT to META (0.44) and from WM to META (0.36). Surprisingly, the direct path from WM to NESI was smaller than anticipated (0.16), and the MRT influenced META and NESI negatively (−0.13 and −0.16, respectively). Men showed better MRT, NESI and META skills than women (Cohen's d = 0.51, 0.40, 0.26, respectively).

Absolute pitch was more helpful for NESI (d = 0.98) than for META (d = 0.28) as was a higher semester (NESI r = .29, META r = .13).

## Conclusions

First, these data provide an initial model of musicians' aural skills, their connection to other skills, and their relevance. As expected, both aural skills (NESI and META) directly covariate to a high degree but are not redundant. Second, the WM skill was not a relevant predictor for NESI. Music-specific skills within sound imagery might be more relevant and compensate for a smaller WM capacity. A deeper understanding for the relationship between sound imagery skills and other proficiencies might encourage the future optimization of teaching methods.

## References (selection)

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