

# Optic and Acoustic Symmetry Perception

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## ABSTRACT

### Background

In the last two decades, contributions from cognitive sciences, experimental psychology and neuropsychology have significantly extended the understanding of optic symmetry perception.

### Aims

The aim of this paper is to investigate both the perception of optic and tonal-acoustic symmetry.

### Method

Twenty-eight volunteers (14 musicians and 14 non-musicians) aged 18-67 participated in the study. The participants were examined individually and the tests were administered in varying order to the various participants. Half of the participants were informed at the beginning of the examination for the possible kinds of symmetry (in order to find out if learning plays a role on symmetry perception). Also, half of the participants were presented before the acoustic stimuli, with a similar kind of symmetry for the optic stimuli. The examination material were: the mirror reversal letter task from PALPA, the paper folding task from ETS, the spatial ability test from ETS, Benton's judgment of line orientation test, digit span (forward and backward) and a newly constructed test, that includes a series of symmetrical and asymmetrical, big and small, optic and acoustic stimuli. Except for the registration of participants' response time (RT) and the correctness of their responses, measurements were also taken with the use of Likert scales for the metacognitive feeling of difficulty (FOD) and the metacognitive feeling of confidence (FOC) and measurements of the aesthetic judgments for each and every one of the optic and acoustic stimuli.

### Results

The majority of the participants (young - middle-aged, women - men, individuals with music education and without music education) did not show statistically significant differences in their scores in the visuospatial tests and the memory tests, while at the same time they had a homogeneously high performance (with almost zero deviation) for all the optic symmetrical and asymmetrical stimuli. For all the acoustic stimuli, a statistically significant difference was found for the participants with music education, not only for the cognitive processing of symmetry, but also for the metacognitive. The proposed (on the basis of the literature) preference (correctness of responses and reaction time) for the mirror symmetrical around a vertical axis optic stimuli was not confirmed and neither there was any confirmation for the preference for repetitive acoustic stimuli. What was found were

more positive aesthetic judgments for the symmetrical formations versus the asymmetrical ones for both senses. Finally, no cross-modal interaction of priming was found, nor influence of prior explanation of the kinds of symmetry.

### Conclusions

These preliminary findings provide support for the independence of the underlying mechanism of optic and acoustic perception of symmetry, with the second one probably being a non-automatic and possibly learned process.

### Keywords

Optic symmetry perception, tonal acoustic symmetry perception, metacognitive feeling of difficulty, metacognitive feeling of confidence, aesthetic judgments.