Spatial vision is superior in musicians when memory plays a role.

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Abstract:

Musicians' perceptual advantage in the acoustic domain is well established. Recent studies show that musicians' verbal working memory is also superior. Additionally, some studies report that musicians' visuospatial skills are enhanced although others failed to find this enhancement. We now examined whether musicians' spatial vision is superior, and if so, whether this superiority reflects refined visual skills or a general superiority of working memory. We examined spatial frequency discrimination among musicians and nonmusician university students using two presentation conditions: simultaneous (spatial forced choice) and sequential (temporal forced choice). Musicians' performance was similar to that of nonmusicians in the simultaneous condition. However, their performance in the sequential condition was superior, suggesting an advantage only when stimuli need to be retained, i.e., working memory. Moreover, the two groups showed a different pattern of correlations: Musicians' visual thresholds were correlated, and neither was correlated with their verbal memory. By contrast, among nonmusicians, the visual thresholds were not correlated, but sequential thresholds were correlated with verbal memory scores, suggesting that a general working memory component limits their performance in this condition. We propose that musicians' superiority in spatial frequency discrimination reflects an advantage in a domain-general aspect of working memory rather than a general enhancement in spatial-visual skills.

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