Critical Review: Do individuals with musical training have enhanced brainstem encoding of linguistic pitch compared to those not musically trained?

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This critical review examines the effects of musical training on brainstem encoding of linguistic pitch. Furthermore, it investigates whether individuals with musical training have enhanced brainstem encoding of linguistic pitch when compared to those not musically trained. Overall, research suggests more robust and faithful encoding of linguistic pitch information by musicians. Musicians also display an enhanced representation of the fundamental frequency, which has been extensively understood to underlie pitch perception. Thus, the two studies reviewed indicate that musicians have better brainstem encoding of linguistic pitch, which suggests a context-general corticofugal tuning of the afferent system. These findings have implications for general
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Search Strategy

Computerized databases, including MEDLINE-

Continuous electroencephalographic data were recorded from Cz (10-20 international system). Brainstem onset response peaks (wave V, A, δ, ˙) were chosen from each individual's responses providing latency and amplitude information. Peak latencies were calculated by subtracting the latency of sound onset (time 0) from the latency of the peak voltage fluctuation for each wave. The strength of pitch encoding was measured by peak amplitudes at F0 (100Hz) and from H2 (200Hz) to H5 (500Hz) of the fast Fourier transforms over the FFR period.

Results indicated that musicians had earlier brainstem responses than non-musicians to speech onset in both the UA and AV modalities. This was evident as early as 10ms after acoustic onset.

Group differences were observed in the frequency-following portion of the response. The grand average fast Fourier transform of responses over time for speech indicated that musicians have enhanced periodicity encoding (phase-locking), particularly linked to the f0 and throughout the FFR period. Amplitudes were larger in musicians than

Possible Implications and Future Directions For Research

The findings from the reviewed articles have practical implications for general social and educational policies (Wong et al., 2007). These implications are especially important when considering the value of musical training in schools