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Differential Modulation Effects of Music Expertise on English and Chinese Sentence Reading

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Here we tested the hypothesis that music expertise modulates different aspects of language processing across different languages, depending on the similarities of the cognitive processes involved. Chinese-English bilingual musicians and non-musicians read legal and semantically/syntactically incorrect sentences in both English and Chinese. In English reading, musicians showed higher sensitivity to linguistic irregularities than non-musicians as reflected in longer reading time and more dispersed eye movements when reading semantically/syntactically incorrect than legal sentences. In Chinese reading, musicians' higher sensitivity was reflected only in reading time but not in eye movement behavior. Thus, music expertise modulated linguistic regularity processing in both English and Chinese reading, but modulated perceptual processes/eye movement behavior only in English reading, which shared similar perceptual demands as music notation reading, i.e., sequential symbol strings separated by spaces. Thus, transfer effects across expertise domains can happen at different cognitive processing levels, depending on the similarities of the processes involved.

Keywords: music expertise, English reading, Chinese reading, eye movement, EMHMM