

INFLUENCE OF MUSICAL EXPERIENCE ON LANGUAGE LEARNERS' DISCRIMINATION OF JAPANESE PITCH ACCENT: EVIDENCE FROM NATIVE SPEAKERS OF MANDARIN CHINESE

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Previous studies have demonstrated that both musical experience and tone language experience enhance the encoding of speech sounds. Nonetheless, their combination effects on pitch perception are not well studied. The current study aims to investigate whether musical experience has additive values on Japanese pitch perception among native speakers of Mandarin Chinese.

64 participants, including 32 musicians (have five or more years of systematic formal musical experience, have high proficiency in playing a musical instrument, and received continuous musical experience recently) and 32 non-musicians (have not received any systematic musical experience previously, have no experience of playing any musical instrument) who did not have any prior experience of learning Japanese, were recruited from a local university. Participants completed working memory capacity task, musical pitch perception task, musical rhythm perception task, and Japanese pitch perception task. Their performance was calculated using accuracy rates. We examined group differences, the relationships between musical perception and Japanese pitch perception, and the prediction of Japanese pitch perception.

Two-tailed independent *t*-tests showed that there was no significant difference in the working memory capacity and musical pitch perception between musicians and non-musicians. However, a marginal significant group difference was found on the musical rhythm perception task, $t(62) = 2.00, p = .050, \text{Cohen's } d = .50$. As for the Japanese discrimination task, musicians had higher accuracy rates than non-musicians, $t(62) = 3.76, p < .001, \text{Cohen's } d = .94$. We also found that Japanese pitch perception was positively correlated with musical pitch perception, $r = .37, p = .002$, and musical rhythm perception, $r = .32, p = .009$. Additionally, we conducted multiple linear regression models with musicianship (musician vs. non-musicians), musical ability (musical pitch perception, musical rhythm perception), working memory capacity, and demographic variables (gender, age, family SES) as predictors while the accuracy rates of Japanese pitch perception as the outcome variable. We found that only musicianship significantly predicts accuracy rates of the Japanese pitch perception after FDR correction of multiple comparisons. Post-hoc comparison suggests that musicians ($M = .94 \pm .01$) had higher marginal means of accuracy rates than non-musicians ($M = .89 \pm .01, p = .008$).

Our findings suggest that long-term musical experience may have additive effects on pitch perception among tone language speakers. Our findings are consistent with theoretical accounts of the shared mechanism and cumulative role of musical experience in language learning.