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Title: Associations between L2 Speech and Music Perception in Mandarin Learners of English

Keywords: music perception, second language learning, melody, Mandarin, English

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Abstract:

Prior work has suggested that musical abilities are associated with second language learning (Slevc & Miyake, 2006), but rhythmic and melodic sub-domains may be differentially associated with language learning. For example, other studies have found rhythm-specific improvement in French learners of English (Cason et al., 2019; Bhatara et al., 2015), but little work has investigated other language learners. In the current study, forty-six native Mandarin L2 speakers of English were tested on musical rhythm and melody perception, and four domains of L2 speech proficiency: segment perception, lexical stress perception, as well as vocabulary and text comprehension. Multiple regressions with both melodic and rhythmic music perception measures as predictors (controlling for overall music experience) were run on each of the four L2 speech domains, revealing that only melody perception significantly contributed to the prediction of segment perception ($\beta = .37, p = .04$), while rhythm perception did not ($\beta = -.18; p = .30$). Neither melody nor rhythm perception predicted lexical stress perception (both $p$’s > .38). Only melodic aspects of music perception correlated with vocabulary ($\beta = .42, p = .015$), while only rhythm perception correlated with text comprehension ($\beta = .36, p = .04$). The results suggest that, firstly, Mandarin speakers show selective transfer of melody perception to English segment perception. The overlap between music abilities and L2 speech processing is more in the processing of spectral information (e.g., in musical melody and speech segments) rather than the information of intensity and duration (e.g., stress), which may be due to Mandarin speakers’ reliance on a
single cue (F0) in perceiving English lexical stress (Wang, 2008). Lastly, the results also indicated that music ability affected higher-level semantic processing (Featherstone et al., 2014), but knowing which semantic skills are associated with which music processing abilities will require additional exploration.

References


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Figure 1. The correlation between melody perception and segment perception (The scores in the tests were converted to Z scores), $r = .34$

Figure 2. The correlation between rhythm perception and segment perception (The scores in the tests were converted to Z scores), $r = .08$