

# DOES MULTILINGUALISM INFLUENCE ATTENTIONAL CONTROL IN THE FORCED-ATTENTION DICHOTIC LISTENING TASK OF CANTONESE TONE?

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It has been claimed that bilinguals exhibited an advantage in attentional control due to choosing a focused language based on the language environment and suppressing unused languages. Soveri et al. [1] examined the processing of consonants by the Forced-attention Dichotic Listening (FADL) paradigm, where participants hear two different stimuli simultaneously and report the clearer one in the Non-forced condition (NF), the left-ear stimuli in the Forced-left condition (FL) and the right-ear stimuli in the Forced-right condition (FR). Both forced conditions, especially the FR, require one's attentional control ability to accomplish, that is, to focus on one stimulus and ignore the other one. The bilingual group outperformed the monolingual group, showing larger accuracy increases in the instructed ear from NF to each Forced condition. However, the comparison between bilinguals and monolinguals overlooked the individual differences and the multilinguals [1]. It is better to consider multilingualism as a continuum, from low-degree (monolingual-like) bilinguals to high-degree (balanced) multilinguals. Moreover, the ear preference pattern of tone processing in the NF condition differs from segments (e.g., consonants) and depends on tone types [2]. For instance, Cantonese contour tones exhibited a greater right-ear advantage than level tones [3]. The tone type may influence ear preference in both forced conditions. Therefore, this study examines whether and how the tone type and, more importantly, the degree of multilingualism influence Cantonese native speakers' attentional control in the FADL task of Cantonese tone.

60 Cantonese-English bilinguals and multilinguals aged 18-25 were recruited in Hong Kong. They completed a language history questionnaire, a Cantonese tone training, and a target FADL task. Multilingual Language Diversity (MLD, based on the dominance and proficiency of all languages the participants acquired) aggregated from the questionnaire [4] measured the degree of multilingualism. The training was a contour-tone and a level-tone identification task with feedback to construct the association between tones and labels (1-6). In the FADL task, contour tone pairs (e.g., /ji2/ 'chair' vs. /ji4 / 'son') and level tone pairs (e.g., /ji1/ 'doctor' vs. /ji3/ 'meaning') were used as dichotic stimuli, generating 324 trials for each tone type. The duration of tones was controlled. Participants were instructed to report target stimuli according to varied conditions (i.e., NF, FL, and FR) by pressing keys (1-6). Accuracy was submitted to statistical analysis.

An ANOVA analysis showed an Tone Type\*Ear\*Condition interaction ( $F(2,708) = 15.1, p < .001$ ). Contour tones showed a larger instructed-ear advantage than level tones in the FL and FR but not the NF, showing greater general attentional control. The asymmetry may be from the difference in acoustic cues and perceptual difficulty [3]. Linear mixed-effects analyses for the role of multilingualism (Fig.1) showed a Condition\*MLD interaction ( $z = 8.2, p < .001$ ) in the right-ear accuracy but not left-ear accuracy, where participants with higher MLD showed larger increases of REA from the NF to FR condition, regardless of tone types. Higher-degree multilinguals who use two or more languages more frequently and proficiently, are more capable of shifting attention to the instructed ear than their lower-degree counterparts, showing better attentional control abilities. The absent interaction in the left-ear accuracy can be explained by the less attentional demands in the FL compared with the FR. The study supported the bilingual advantage in attentional control [1] and moved forward to a multilingual level.

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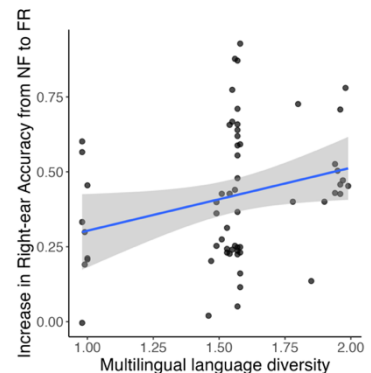


Fig1. MLD interaction with the right-ear accuracy increase from NF to FR