Completion Report

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Background: Oral-diadochokinesis (oral-DDK) is commonly used to assess speech-motor control, but cross-linguistic differences in performance remain underexplored. Although norms for oral-DDK performance have been established for English speakers, there is limited research investigating whether these norms are applicable to speakers of other languages. Consequently, applying common oral-DDK norms from English speakers to other language groups may lead to inaccurate evaluations and diagnoses. Additionally, the selection of specific stimuli tailored to one population might further contribute to misinterpretations.

Aims: This study compared oral DDK rates between Malaysian Chinese (Mandarin) and Japanese speakers, who have distinct linguistic backgrounds. The second goal was to further examine the effects of different stimulus types, age groups, and gender on oral-DDK rates and the interaction between language and stimulus types on oral-DDK performance in two participant groups.

Methods: We tested 126 Japanese speakers and 105 Mandarin speakers, ages 20-79, using seven different stimuli: ka, pa, ra, sa, ta, pataka, and mataka. We counted how many syllables each person could produce in 8 seconds. To analyze the results, we used a statistical method called hierarchical linear modeling, which looked at the effects of language, stimulus type, age, and gender. We also conducted pairwise comparisons to find significant differences.

Results: Japanese speakers had faster oral DDK rates than Mandarin speakers for all the stimuli, with significant differences in how language interacted with the stimuli. The largest differences were seen for the sounds "ta" and "pa," while the smallest differences were for "ra" and "pataka." Younger adults (ages 20-39) performed faster than older adults (ages 60+), but there were no gender differences.

Conclusion: There are clear differences in oral DDK performance between Japanese and Mandarin speakers, which may be due to differences in their languages and sounds. The findings revealed that Japanese speakers consistently demonstrated faster oral-DDK rates than Mandarin speakers across all stimuli, with significant language-by-stimulus interactions. Furthermore, younger adults exhibited significantly faster oral-DDK rates compared to older adults, while no significant gender differences were observed. Furthermore, younger adults exhibited significantly faster oral-DDK rates compared to older adults, while no significant gender differences were observed. Age affects how well people perform, but gender does not. These results show the importance of having language-specific standards when assessing people from different language backgrounds. More research is needed to explore other languages and factors that influence speech motor control.

Future directions: This study highlights significant cross-linguistic differences in oral-DDK performance between Japanese and Mandarin speakers as Japanese speakers have faster rates across stimuli. These differences bring an insight into the influences on linguistic and phonological factors unique to each language. Besides, age bring a significant effect on oral-DDK rates, with older adults performing slower rate, while gender shows no impacts on oral-DDK rates. These findings highlight the need for language-specific norms in oral-DDK assessment to improve diagnostic accuracy for related speech disorders. Additional languages and factors influencing speech motor performance is necessary to be explored in order to further enhance clinical practices.

Publication of the Results of Research Project:

Verbal Presentation (Date, Venue, Name of Conference, Title of Presentation, Presenter, etc.)

1. Ong YQ, Lee J, Chu SY, Chai SC, Gan KB, Ibrahim NM, Barlow SM (2024). Oral-diadochokinesis between Parkinson's disease and neurotypical elderly among Malaysian-Malay speakers. *International Journal of Language & Communication Disorders*. *59* (5), 1701-1714. http://dx.doi.org/10.1111/1460-6984.13025
2. Ong, Y. Q., Lee, J., Tamura, T., Kariyasu, M., Chai, S. C., & Chu, S. Y. (2024). Oral diadochokinetic rates in Malaysian-Mandarin and Japanese young adults: Preliminary findings. *Proceedings of RESEARCH FORA INTERNATIONAL CONFERENCE*.
3. Ong, Y. Q., Lee, J., Tamura, T., Kariyasu, M., Chai, S. C., & Chu, S. Y. (2024). Oral diadochokinetic rates in Malaysian-Mandarin and Japanese young adults: Preliminary findings. *Proceedings of RESEARCH FORA INTERNATIONAL CONFERENCE*.
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5. 田村俊暁, Ying Qian Ong, 苅安誠,Shin Ying Chu. オーラル・ディアドコキネシスと使用言語：マレーシア・マンダリン人と日本人の比較. 第68回日本音声言語医学会総会・学術講演会. 2023-10-5/6. 倉敷市民会館。
6. Choong, X. P., Shi, X., Tamura, T., Ong, Y. Q., Chu, S. Y., Lee, J., & Kariyasu, M. (in preparation for journal submission). Cross-linguistic comparison of oral-diadochokinesis rates between Chinese and Japanese speakers.- expected to submit in April 2025.
7. Without Emoji, can you still have written conversation? ; Newspaper Interview by the Sin Chew Daily. 2021

Thesis (Name of Journal and its Date, Title and Author of Thesis, etc.)

none

Book (Publisher and Date of the Book, Title and Author of the Book, etc.)

none