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SUDARAT LIPATARAT : INTERACTIONS BETWEEN MOTOR ACTIONS AND LANGUAGE FUNCTIONS IN RIGHT AND LEFT HANDED SUBJECTS. THESIS ADVISORS : THYON CHENTANEZ, Ph.D. BOONSIRM WITAYACHUMNARNKUL, M.D. Ph.D. YUPIN SANVARINDA, Ph.D., PANYA KAIMUK, M.D. 103 p. ISBN: 974-662-652-3

The purpose of this study was to investigate the interactions between the language center activities and the motor center activities in order to develop a possible new method for language center localization. A test was set-up which included the use of a number of students (aged 15-20 years) who were required to follow a pre-determined test protocol. In total, 70 students took part in the study. The students were divided into three groups by hand preference: 30 right-handed, 25 left-handed, and 15 ambidextrous. Two sets of tests were performed: (A) oral reading with and without concurrent fingers and toes tapping during the full (FVF), right-half (RVF) and left-half (LVF) visual field conditions, (B) counting with and without concurrent fingers and toes tapping. The results showed that during FVF (signal goes to both sides of the brain) and RVF (signal goes mostly to the left brain), the reading speed increased whereas the concurrent tapping speed decreased. More interference of the right hand tapping was seen during FVF, in all the three groups. During LVF (signal goes mostly to the right brain), the reading speed decreased and the concurrent tapping speed decreased in all the three groups. For the right-handers, the counting speed decreased simultaneously with both legs tapping and the concurrent tapping speed of both hands and both legs decreased. For the left-handers, the counting speed decreased simultaneously with the left big toe tapping only, and the concurrent tapping speed of both hands decreased. For ambidextrous subjects, the counting speed was unchanged whereas the concurrent tapping speed of both hands decreased. The results showed that the patterns of reading and counting interacted with tapping of both hands and both legs were quite similar among the three groups. It could be concluded that the language centers of the right-handers, left-handers, and ambidextrous subjects who participated in this study may be mostly located in the left hemisphere. These preliminary conclusions still need to be further validated by correlating the patterns of these interactions with more direct methods of language center localization (e.g. PET scan and Wada test) of each individual subject in the future.