Does interpreting training affect plasticity in domain-general cognitive control? A longitudinal ERP-study

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As supported by studies from cognitive science, training a certain skill can result in cognitive changes and even remodel our brain. In that fashion, learning and training a language have repeatedly shown to be accompanied by changes in brain structure and functionality (Mechelli et al. 2004, Becker et al. 2016). This training induced plasticity taxes both domain-general language control functions as well as domain-general executive functions. These two areas have been shown to partially overlap in the brain (Abutalebi et al. 2012). Within the context of language professionals, the interpreter advantage hypothesis offers an intriguing perspective. Although it has become clear that different factors such as age of acquisition, frequency of language use or bilingual status might influence the formation of cognitive control, it is proposed that interpreting as a highly complex and cognitively demanding professional task that requires frequent language switching under pressure leads to a more articulate manifestation of benefits in the domain-general executive functions (Hervais-Adelmann et al. 2017, Elmer et al. 2014). Considering all this, my dissertation project examines changes that occur in the domain-general executive functions during interpreting training. It probes the question whether improved executive functions can be developed through interpreting training. Within a longitudinal design, a group of interpreting students and a control group is tested on three psycholinguistic tasks that tap into the executive functions of inhibition, monitoring, attention, switching and working memory updating that also overlap with control characteristics of the interpreting experience. By using an experimental design that combines event-related potentials, behavioural data as well as competence data, occurring changes in the executive functions over the course of a four-semester interpreting programme are closely monitored. Specifically, the N2, N1 and P3 ERP components are examined. First results show a diverging pattern in different executive functions. While inhibitory functions involved in interference suppression seem to peak after the second semester of training, inhibitory functions in task switching and monitoring peak after the third semester of interpreting training. Furthermore, the working memory component of task switching seems to be trained up until the end of the fourth semester. This suggests that certain executive functions automatize after a relatively short period of training while others further develop. This study not only contributes to new insights in neurolinguistic research, but also offers new perspectives on interpreting studies and didactics.

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