DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Research of bilingualism is one of the most dynamically developing domain of research (e.g. in sociolinguistics, neurolinguistics). It is certainly due to the scale of the phenomenon – great amount of people all over the world use more than one language on daily basis – as well as the interdisciplinary character of such studies. The relatively new neuroimaging method, functional magnetic resonance (fMRI) opened new possibilities and perspectives for broadening the knowledge about bilingualism. For example such studies revealed that overlapping brain circuits are involved in the processing of all the languages known to the multilingual language users, even if some environmental and behavioral factors (like age of acquisition and level of proficiency) may be related to alterations in the organization of the neuronal language network.

A fascinating phenomenon for researchers exploring brain organization for language is sign language – natural, fully developed language of deaf based on visuo-manual communication. Sign languages are distinct for different communities, for example in Poland deaf people use Polish Sign Language (PJM). How sign languages are represented in the brain? Does learning sing language reorganize the brain in the same way as learning of any other foreign language? Could factors like the age of acquisition, or level of proficiency modulate brain activity during processing of sign language in a similar way as in spoken foreign language processing? These are only some of the questions puzzling scientists and many of them still remain unanswered. Neuroimaging methods have lately discovered that apart from the fundamental perceptual differences, spoken and sign languages are organized in the brain in very similar networks. Yet, we still know very little about how the acquisition of this new way of communication, with usage of hands and eyes, shapes the brain of hearing subjects.

Little is known about how the level of proficiency or the age of acquisition of sign language affect brain activation. In the current study, we aim to fill this gap in the research. To accomplish this goal, we will recruit two groups of hearing users of PJM – those who learned to sign in adulthood and are highly proficient, and those, who were immersed in both spoken and hearing language in early childhood, having deaf parents (*children of deaf adults*, CODA). Comparison of those groups will help us understand if the age of acquisition is related to different strategies of neural processing of sign language. Additionally, we will use the data collected in the ongoing research project, examining hearing adults who were enrolled in PJM course, but never reached a high proficiency in this language (their proficiency level corresponds to A1). Comparison of groups who learned to sign late, but are proficient, with late learning beginners, will allow us to assess what are the neural correlates related to the level of proficiency. Answering these questions can shed light about second language acquisition in general and the results of the study will be interesting not only for the researchers investigating sign language and bilingualism, but also broad scientific community of neurolinguists and researchers interested in neuroplasticity mechanisms.