

Neurolinguistic aspects of speech processing

Plenary speech by

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Speech is considered to be one of the uniquely human faculties and it is therefore natural that it has been the topic of interest throughout millennia. The study of neurolinguistic aspects of speech (and language) dates back to about 3000 years B. C., when the first mention of brain in relation to speech was found in old Egyptian scrolls. For the longest time the insights into how brain processes speech have been gained from clinical population, by observing speech and language behavior of individuals with diagnosed neurologic impairments and/or by examining *post mortem* data and relating them to available information on speech functioning. It is only in the past several decades, with the advent of new technologies, that it has become possible (and ethical) to study speech in healthy individuals not only indirectly, by behavioral methods, but increasingly more 'objectively' and in real time. Techniques such as positron emission tomography (PET), functional magnetic resonance imaging (fMRI), event related potentials (ERP), to name just a few, have enabled researchers to peak into the intact brain as it performs

various speech and language tasks. This has led to re-evaluation of the existing theories and models of speech processing as well as to emergence of new ones.

The presentation will address neurolinguistic aspects of speech processing in general and also try to shed some light on special contexts: developmental, bilingual and disordered. Developmental issues will focus on plasticity and milestones in speech development, including consequences of early deprivation (sensory or otherwise). Studies of bilinguals have given us a wealth of information about speech and language processing in monolinguals as well. The focus here will be on the differences in 'brain organization' between monolinguals and bilinguals, as well as on the differences in the representation of bilinguals' two languages. Finally, the section on disordered speech will, hopefully, complete the picture by showing the relationship between neurologic disorders and/or trauma and speech behavior.