

Timing is everything: Converging evidence for prediction of language delays from infancy to later childhood

April A. Benasich, Ph.D.

The ability to perceive and categorize auditory signals occurring within tens of milliseconds is one of the skills essential to mounting language. Psychophysical studies of infants strongly suggest that the acoustic capabilities of the human infant are impressive and include keen sensitivity to auditory sweeps, gaps and changes in frequency. Ongoing research in our laboratory provides evidence that the ability to perform fine-grained analyses in the tens of millisecond range appears to be one of the most powerful and significant predictors of subsequent language development and disorders. In this lecture, I will detail research that examines the predictive role that efficient processing of brief, rapidly-presented, successive auditory stimuli in infancy plays in early language acquisition. An overview will be given of a series of studies that suggest that difficulties in discriminating rapidly successive sensory events can be demonstrated for a subset of children early in infancy, well before verbal language is in place. Moreover, it will be shown that this processing difficulty emerges for both non-speech and speech stimuli and further, that these differences in infant processing thresholds are predictive of later language outcome. Data from converging paradigms, specifically EEG/ERPs and behavioral assessments of information processing, will be presented and discussed. Analyses of the differences in the pattern and density of power spectra in resting EEG will also be shown for children with a family history of language-based learning disorders as compared with controls. Finally, preliminary data will be presented suggesting that early intervention may allow infants to develop more efficient fine-grained auditory processing skills. The potential for early intervention, and thus the need for assessment tools that can be applied reliably in individual infants at higher risk for developing a language disorder will be discussed.