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Neurobiological bases for phonological and phonetic processing

Recent research in Cognitive Neuroscience has demonstrated that the proposed distinction between Phonetics and Phonology is neurobiologically plausible. Processes focusing on linguistic units with increasing distances from the speech signal are supported by brain areas with increasing distance from primary auditory cortices in the supratemporal plane. Put differently, there seems to exist an abstraction gradient in auditory processing areas which parallels the previously established abstraction gradient in vision. I will here present two pieces of evidence from phonetic and phonological phenomena that are compatible with a neurobiological distinction between Phonetics and Phonology. To this end, I present electrophysiological data on the processing of intrinsic pitch in vowels and neuroimaging data on the processing of German final devoicing. The results illustrate that intrinsic vowel pitch is evaluated early in the processing stream, while final devoicing, apart from auditory regions, additionally recruits frontal brain areas supposed to assist phonological and categorical distinctions.