Effects of cognitive load on speech perception

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Improving the validity of speech-recognition models requires an understanding of how speech is processed in everyday life. Unlike listening conditions leading to a degradation of the signal (e.g., noise), adverse conditions that do not alter the integrity of the signal (e.g., cognitive load, CL) have been under-studied. Drawing upon behavioural and imaging methods, our research shows that CL reduces sensitivity to phonetic detail and increases reliance on lexical knowledge. Critically, however, we found that increased reliance on lexical knowledge under CL is a cascaded effect of impoverished phonetic processing, not a direct consequence of CL. Evidence for deactivation of auditory cortex associated with early phonetic analysis under CL confirms the early, sensory locus of CL. Findings of increased auditory thresholds under CL add further support to the case for an early locus of interference. The results not only constrain our understating of the functional architecture of speech-recognition models, they also invite a re-analysis of the validity of hearing tests for assessing everyday listening.