

Using Pupillometry to Examine Costs of Speaker-Switching Within and Across Accents

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Prior work indicates that listening tasks with multiple speakers (versus a single speaker) result in slower and less accurate processing (Mullennix et al., 1989). Notably, the trial-to-trial cognitive demands of switching between speakers or switching between accents have yet to be examined.

We used pupillometry, a physiological index of cognitive load, to examine the demands of processing first (L1) and second (L2) language-accented speech when listening to sentences produced by the same speaker consecutively (no switch), a novel speaker of the same accent (within-accent switch), and a novel speaker with a different accent (across-accent switch). Inspired by research on sequential adjustments in cognitive control (Gratton et al., 1992), we aimed to identify the cognitive demands of accommodating a novel speaker and accent by examining the trial-to-trial changes in pupil dilation during speech processing.

Our results indicate that switching between speakers was more cognitively demanding than listening to the same speaker consecutively. Additionally, switching to a novel speaker with a different accent was more demanding than switching between speakers of the same accent. However, there was an asymmetry for across-accent switches, such that switching from L1 to L2 accent was more demanding than the reverse.

Findings from the present study align with work examining multi-talker processing costs and provide novel evidence that listeners dynamically adjust cognitive resources to accommodate speaker and accent variability. We discuss these novel findings in the context of an active control model (Magnuson & Nusbaum, 2007) and auditory streaming framework (Kapadia & Perrachione, 2020) of speech processing.

References

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