

Experience and personality modulate pupillary responses during real-time processing of within-language accent shifts

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Speech perception shows substantial individual differences, but the mechanisms underlying this variability in real-time accent adaptation remain poorly understood. More specifically, it is unclear whether processing asymmetries between more and less familiar accents reflect stable differences in long-term representations or temporary phonetic recalibration demands. Previous work using pupillometry [1] reported asymmetric switching costs for first- (L1) and second-language (L2) accents, interpreted within two theoretical accounts. An auditory streaming account [2] predicts stable attentional costs for any speaker change, whereas a phonetic recalibration account [3, 4] predicts asymmetric costs that diminish with exposure. The aim of the current study was to examine whether these dynamics extend to within-L1 accent switching in a semi-naturalistic dialogue and whether they are shaped by individual differences. We used pupillometry to examine within-trial switching dynamics and changes in processing effort while participants (76 German listeners, $M = 23.1$, range 18-36) listened to a semi-natural dialogue (271 utterances, taken from [5]) alternating between familiar Standard German and a less familiar Alemannic regional variety. Growth curve analysis revealed switching costs and initial asymmetries (replicating [1]), with greater effort for the regional variety and for switches from Standard German to Alemannic. Over the course of the dialogue, the accent-related asymmetry diminished as listeners adapted to the regional variety, while switching costs remained stable (see Figure 1). Individual differences further modulated these effects. A k-means cluster analysis yielded two distinct listener profiles (see Figure 2). Listeners with greater exposure to Standard German, younger age, lower openness, and more favorable evaluations of the standard speaker showed stronger switching asymmetries, whereas switching costs did not differ reliably between profiles. The results suggest that switching costs and asymmetries reflect partly distinct underlying processes, and that accent adaptation is dynamic, sensitive to extended exposure, and shaped by individual differences in language experience and personality. These findings advance our understanding of real-time adaptation to sociolinguistic variation in a dialogue, extend beyond L1–L2 contrasts to within-L1 varieties, and highlight how language experience and personality jointly shape spoken-language processing.

References

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Figures

Figure 1: Average baseline-corrected pupil responses expressed as percent change from the pre-stimulus baseline over time, plotted for three time windows.

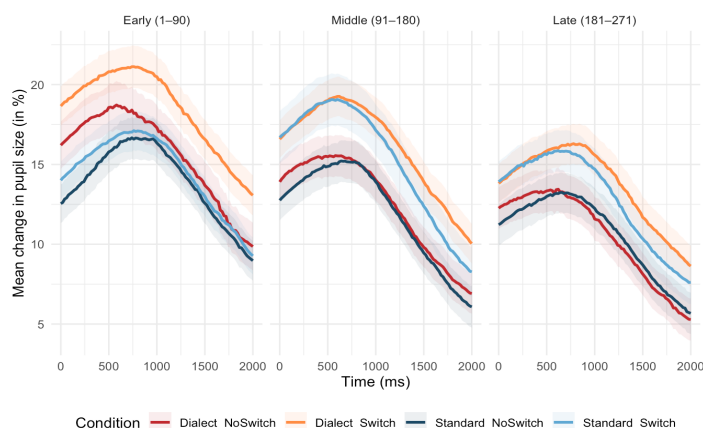


Figure 2: Cluster comparison chart with significant variables after H-B correction in bold.

