Compensatory shortening before coda clusters in the production and perception of German monosyllables

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The main aim of the present study was to investigate incremental coda compensatory shortening in the production and perception of German monosyllables and the influence of accentuation (i.e. accented vs. deaccented) and codas' manner of articulation (i.e. obstruent vs. sonorant) on the degree of compensatory shortening. Ten speakers produced German words like /knɪk/ and /knɪkt/, and we measured the duration of the vowel and the first coda consonant (C1). Results show no overall vowel shortening – irrespective of accentuation and manner of the following consonant – although vowel shortening was speaker-dependent. Additionally, a tendency for compensatory shortening of C1 was observed for all speakers.

In a subsequent experiment, we tested whether listeners perceive those shortening effects. Natural productions of the production experiment (5 selected speakers who showed shortening effects) were presented to 21 different subjects whose task was to judge which vowel in a pair like /knɪk/ and /knɪkt/ they perceived as longer. In order to test whether listeners are sensitive to the shortening of a particular context or a combination of segments, we selected the most extreme productions per speaker (i.e. high vowel+C1 shortening vs. no vowel+C1 shortening; only vowel/C1 shortening). In about two thirds of all instances listeners perceived vowels before simplex codas to be longer – regardless of whether the vowel was shortened or not. However, listeners perceived vowels in sonorant word pairs with no duration difference to be longer before complex codas more often than in sonorant word pairs with duration difference.

Although we found no effects of vowel shortening in production, the results from the perception experiment suggest that there is perceptual vowel shortening before complex codas and that there is a tendency for compensation for compensatory shortening.