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Online processing of phonological variation in speech comprehension: The case of assimilation

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Understanding speech requires the listener to compensate for the numerous variations that can occur in everyday spoken language. We investigated the compensation for variation introduced by phonological processes. In particular, we considered compensation for place assimilation in English (e.g. *sweet* becoming *sweek* in the phrase *sweet girl*) and as a comparable rule, voice assimilation in French (e.g. *botte* becoming *bode* in the phrase *botte bleue*, 'blue boot'). Several experiments (Gaskell & Marslen Wilson 1996, 1998) have shown that English listeners compensate for place assimilation. We compared English and French in a cross-linguistic experiment, to show whether this compensation pattern for assimilation is conditioned by language-specific processes.

We used a word detection task: the listener had to press a button as soon as she/he detected an auditorily specified target word in a spoken sentence. In both English and French stimuli, the carrier words in the sentences surfaced in different forms (with or without change). There were two conditions for change:

1. The carrier was assimilated either in voicing or in place.
2. The carrier contained the same change as in condition 1 but in an incorrect phonological context: it would normally not occur in this form there.

We obtained the following design:

Language	Target	Voicing	Place	Context condition
French	botte	bo[d] bleue #	* bo[p] bleue ~	"correct"
	'boot'	* bo[d] mauve # ~	* bo[p] mauve ~ #	"incorrect"
English	sweet	* swee[d] boy #	swee[p] boy ~	"correct"
		* swee[d] melon # ~	* swee[p] melon ~ #	"incorrect"

* = illegal form according to the respective language AND to the corresponding assimilation rule

= predicted "bad" form for English subject

~ = predicted "bad" form for French subject

If the assimilated word is recognized as the target in the first (correct) context condition, but not in the second (incorrect) condition, then the listener compensates for assimilation. Our predictions were that French listeners would compensate for voice assimilation (the native process) but not for place assimilation (the nonnative process). For French listeners, words that undergo place assimilation should not be detected regardless of the context. The opposite would be true for English listeners: voice-assimilated carriers should not be detected, whereas place-assimilated carriers should be identified as the target in the appropriate context. The first results we obtained confirmed this prediction.

Furthermore, we will present the results of this experiment on late English-French bilinguals, considering the following questions: Can a nonnative phonological rule be learned? If so, do the compensation procedures differ? Do we export native rules to a second language, or do we ignore them?

Gaskell, G., and Marslen-Wilson, W. (1996) Phonological variation and inference in lexical access. *Journal of Experimental Psychology: Human Perception and Performance* 22, 144-158.

Gaskell, G. & Marslen-Wilson, W. (1998) Mechanisms of phonological inference in speech perception. *Journal of Experimental Psychology: Human Perception and Performance* 24, 380-396.