Divine – divinity: The role of vowel and stress alternation in L1 and L2 processing of Romance loanwords

All Germanic languages have borrowed heavily from Romance. In English, affixed loans were usually borrowed as monomorphemic words and the relationship between derived form and base was established later (Lahiri & Fikkert, 1999). Consequently, metrical stress rules operated on individual items, often leading to stress and vowel differences between the base and derived word. Two types of vowel alternations are critical in English: Trisyllabic shortening (TS; a rule from late Old English) where the stressed vowel shortens and becomes lax when followed by two syllables, and medial laxing where the stressed vowel of a verb becomes short regardless of the number of syllables following it. For Romance loans in German, the operating rules have led to different alternation patterns, i.e., possible stress alternations but the vowel quality remains the same. In contrast to Romance loans, Germanic words in English and German always bear initial stress.

The question we addressed is to which extent first-language (L1) metrical patterns have an effect on the processing of loans. Do L1 metrical patterns assist or hinder the perception of Romance borrowed words when L1 German speakers are processing English words? Of course, current L1 speakers have no knowledge that their lexicon consists of both borrowed and native words. Here we examined the processing of Romance loans in English by both L1 English speakers and second-language (L2) speakers whose first language is German.

In a cross-modal ERP priming study, we tested the impact of vowel and stress alternation in morphologically related words on word processing. We focused on four conditions, alternating vowel quality and/or stress placement (see Table 1) between the derived and base forms. We employed a lexical decision task where participants would hear a complex word followed by the base form appearing on the screen. Accuracy data, reaction times (RT) and brain activity were recorded.

In all conditions in both languages, we found a significant priming effect for both RT and ERP data (see Figure 1 for RT priming effects). For the latter, the waveforms were less negative (i.e., smaller N400) for experimental primes compared to unrelated (i.e., control) primes indicating easier integration processes. In addition, L2 speakers were less accurate when vowels differed between related words (e.g. *opaque~opacity*). Similarly, the effect of alternating vowels (iii and iv) results in differences in the P600 (i.e. a later time window; similar to Morris & Stockall, 2012) as compared to alternating stress patterns (ii) and our baseline condition (i; see Figure 2). This indicates that vowel alternations are more effortful to process for L2 speakers. No such processing difficulties or increased accuracy errors were found in the English L1 group. On the contrary, for L1 speakers, the P600 effect of the baseline condition (i) patterned with the condition where both stress and vowel alternated (iv); and that, in some way, items in those two conditions were easier to integrate compared to sole stress shift (ii) and sole vowel alternation (iii).

Our results show that L1 speakers of German have no difficulties in processing stress differences in derivational pairs but expend more effort when the derivational pairs contain vowel alternations which, for the items in the experiment, do not occur in German. This shows that the L1 phonology keeps playing a role in highly proficient L2 speakers. The L1 English results hint towards a special treatment of vowel and stress alternations (iv) in the mental lexicon potentially linked to TS and medial laxing being such common phenomena in English.

References

Lahiri, A., & Fikkert P. (1999). Trisyllabic shortening in English: past and present. *English Language and Linguistics* 3, 229–267.

Morris, J., & Stockall, L. (2012). Early, equivalent ERP masked priming effects for regular and irregular morphology. *Brain and language*, *123*(2), 81-93.

Table 1. Experimental conditions and example stimuli

	Condition	Experimental Prime	Target	Phonological processes
(i)	+ VOWEL + STRESS	attáchment	attách	no change in base
(ii)	+ VOWEL – STRESS	actívity	áctive	stress shift
(iii)	– VOWEL + STRESS	opácity	opáque	V: Trisyllabic shortening
(iv)	– VOWEL – STRESS	ábstinence	abstáin	V: Medial laxing

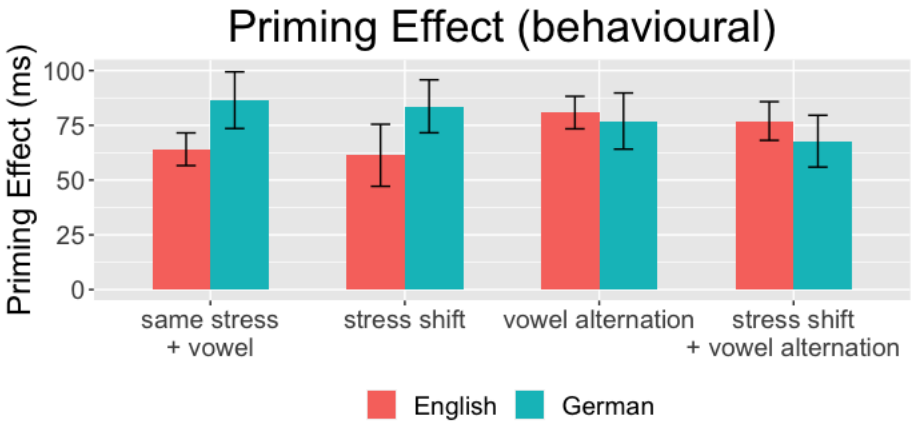

Figure 1. RT priming effect in milliseconds across both language groups (English L1 speakers and L2 English speakers with German as L1)

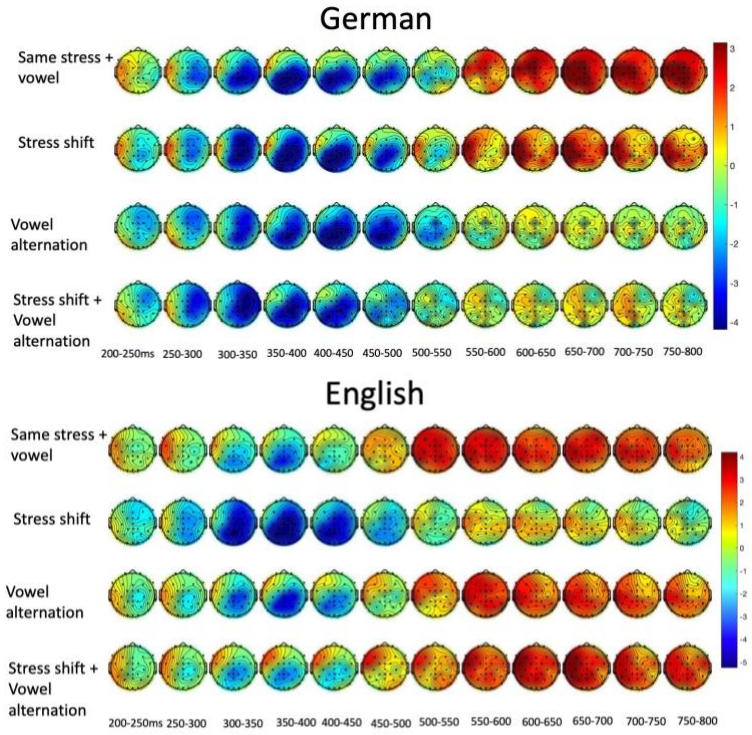

Figure 2. Topographic plots showing the difference between the control minus the experimental items for each of the four conditions between 200-800 ms post target onset.