

An MMN Investigation of the Spectrum of Word Violability in English

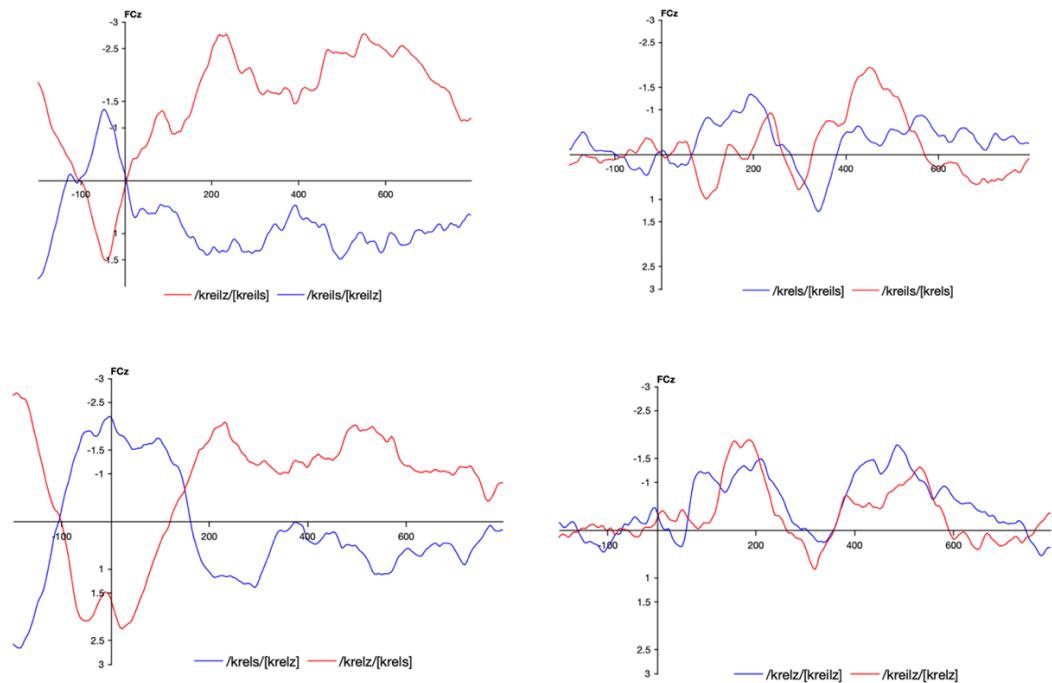
As part of our general intuitions about our native language, we all have a notion of what an acceptable “word” is. This intuition is based not only on our knowledge of individual phonemes comprised of contrastive features, but also the combination of certain features. Crucially, acceptability of word status is not dualistic: some constructions are more acceptable than others. This study examines how specific constraints contribute to word acceptability in English.

Acceptability can also be a function of morphological complexity. For example, in English words that end with a coda containing two consonants (sonorant + fricative) such as [ls] or [lz], there is a strong constraint against trimoraic rhymes ending in a voiced fricative. This results in a preference for inflected words containing a final cluster ending + voiced [z]. While a monosyllabic monomorphemic word may end with a rhyme consisting of V + [ls] (e.g. *else*), this construction cannot be an inflected word: specifically, a form ending with V + [ls] cannot be a legal plural. The question we ask here is thus: what drives the violation in English more: phonological or morphemic constraints?

Using a passive auditory oddball task (N=20), we measured the component of mismatch negativity (MMN; Näätänen et al., 1978), an index of the automatic detection of a deviant stimulus. The auditory stimuli consisted of combinations of four pseudowords containing the vowels [ɛ]/[eɪ] and coda clusters [ls]/[lz]: ([k₁eɪls], [k₁eɪls], [k₁eɪlz], [k₁eɪlz]). The four stimuli reflect a hierarchy of acceptability: [k₁eɪlz] can be perceived either as a monomorphemic or inflected word, [k₁eɪlz] as an inflected word (plural of [k₁eɪl]), and [k₁eɪls] as a monomorphemic word. Finally [k₁eɪls], a rhyme ending with VV + [ls], is impossible.

In the time-window 150-250ms, we found an asymmetric MMN for the *krels*~*kreilz* comparison: the [k₁eɪls] deviant elicited significantly higher MMNs ($p < 0.001^*$) than the reversed condition (see Figure 1). An asymmetric MMN was also found for the *krels*~*krelz* combination, where the [k₁eɪls] deviant elicited significantly higher MMNs ($p = 0.001^*$) than in the reversed condition. Thus, both combinations in which the medial vowels remained constant but the coda clusters were alternated (*k₁eɪlz*~*k₁eɪls*, *k₁eɪl*~*k₁eɪls*), elicited an asymmetry in brain activation, with the words ending in [ls] coda clusters resulting in higher MMNs than the words ending in [lz] clusters. The results suggest that acceptability is not only attributed to phonemic structure of a word but also morphological complexity.

Figure 1: Grand Average waveforms for all eight comparisons: /standard/[deviant]



Works Cited:

Näätänen, R., Gaillard, A. W., & Mäntysalo, S. (1978). Early selective-attention effect on evoked potential reinterpreted. *Acta psychologica*, 42(4), 313-329.