

## The role of possible words in speech comprehension

Adriana Hanulíková  
Humboldt University Berlin  
Unter den Linden 6, 10099 Berlin, Germany  
adriana.hanulikova@hu-berlin.de

The activation and competition of word candidates are central processes of spoken word recognition, and have been implemented by models of speech perception. Previous research has identified many cues to word boundaries that can effectively modulate the activation of competing candidates and help segment the incoming speech. These cues, such as phonotactic constraints or metrical structure, depend on language specific properties. Some recent theories seek segmentation strategies that are universal and do not hinge on language specificity.

The Possible-Word Constraint (PWC) discovered by Norris, McQueen, Cutler and Butterfield (1997) appears to be such a universal strategy. According to this constraint, words enter into an activation and competition process in a way that lexical parses including impossible words - not being syllables - are disfavoured. Put simply, single consonants, because they don't constitute syllables, are not considered as appropriate parsing units and will not be treated as viable residues of the input. This applies in a universal manner, and the actual lexical status of words in a specific language is not relevant as shown in previous studies with languages such as English, Sesotho, Japanese, Dutch and Cantonese.

Using a word-spotting paradigm, this study tested the predictions of the PWC on German and Slovak. Slovak is a language where single consonants, such as [g] and [f] (allophones of *k* 'in' and *v* 'in') for example, are actual words, but cannot be syllable peaks. In German, single consonants do not constitute words. If the PWC is indeed a language universal, then Slovak listeners should - just like Germans - find it more difficult to leave a single consonant stranded as compared to a syllable.

In the German experiment, listeners were significantly faster at spotting a target in a nonsense string when the preceding context was a syllable (e.g. *Rose* 'rose' in *suckrose*) than when it was a single consonant (e.g. *krose*). The results from a parallel Slovak experiment show the opposite pattern. Thus, target detection was significantly faster in a preceding consonant context as compared to a syllable context (e.g. *ruka* 'hand' in *gruka* versus *dugruka*). In addition, there was also a significant difference between single consonants depending on whether they constitute an existing word in Slovak. The target has been activated faster with a preceding preposition (e.g. *gruka*) than with a non-prepositional consonant (e.g. *truka*). Responses in both of these conditions were still significantly faster than the syllable condition. Two control lexical-decision experiments ruled out the possibility that the observed differences could be attributed to different acoustic realisations of the targets over conditions.

The findings of this study confirm the PWC in German. However, the Slovak results suggest that language-specific factors may be needed to explain segmentation in Slovak. An alternative account capturing the available data will be discussed.

## References

Norris, D., McQueen, J.M., Cutler, A., Butterfield, S. (1997). The possible-word constraint in the segmentation of continuous speech. *Cognitive Psychology*, 34, 191-243.