

Listeners' native phonology affects segmentation of artificial speech streams

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Statistical learning has been used to explain how language learning might rely, at least partially, on the use of domain general cognitive skills. However, learners' previous knowledge and different characteristics of the linguistic input might be a potential issue for such mechanisms. In the light of previous studies of Danish suggesting a negative impact of complex phonetic structures on rate of vocabulary acquisition (Bleses *et al.* 2010), we investigated whether a potential native phonology bias is observable in artificial language learning. Based on the classic Saffran *et al.* (1996) word segmentation experiment, adult subjects from different language backgrounds (N=60 Danish; N=60 Norwegian; N=60 US English) were exposed to one of two artificial languages, then tested on their ability to recognize words from that language in a series of two-alternative forced-choice tests. Aim of the study was to determine whether the identification of statistical regularities - the 'acquisition' of words - in speech streams with different ratios of contoids and vocoids varies as a function of the listeners' native language, and of its *contoid-to-vocoid ratio*. Using strings of concatenated CV-syllables, we created two distinct artificial languages - a 'contoid-language' and a 'vocoid-language' - where the C was respectively a contoid (plosive) or a vocoid (semivowel). The speech stream contained no pauses, prosody or stress patterns, the only cue to 'word' boundaries being forward transitional probabilities between adjacent syllables (within-word = 1.0; between-word = 0.2). Our results showed that (1) all subjects performed above chance level on both *contoid-* and *vocoid-language*, substantiating previous evidence suggesting that the use of distributional cues to word boundaries for segmentation is relatively reliable; (2) the listeners' native language influenced the performance on the segmentation tasks, as both Danish and Norwegian subjects score higher than subjects in the US English native language group; (3) the listeners' native language also influenced the speed at which subjects correctly recognized words from the artificial language, with Danes being not only faster than Norwegians and Americans, but also faster in the *vocoid-* than in the *contoid-language*. Variability in performance across native language groups hints at a link between the listeners' native phonology and segmentation performance, possibly explained by different ratios of vocoids in the languages used in the present study. This hypothesis is also backed up by the variability in reaction times to *contoid-* vs. *vocoid-words* observed in the three groups.

Bleses, D., Basbøll, H., Lum, J. & Vach, W. (2010). Phonology and lexicon in a cross-linguistic perspective: the importance of phonetics - a commentary on Stoel-Gammon's 'Relationships between lexical and phonological development in young children'. *Journal of Child Language*, 38(2011), 61-68.

Saffran, J.R., Newport, E.L. & Aslin, R.N. (1996) Word Segmentation: The Role of Distributional Cues. *Journal of Memory and Language*, 35, 606-621.