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# Representations in the Developing Lexicon for Consonants and Vowels

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## Introduction

Research has found conflicting results in the development of speech perception and production for consonants and vowels. For example, research looking at infants' speech perception has found that they become attuned to their language-specific vowel inventories around 6-months (Kuhl et al. 1992), and to their language-specific consonant inventories around 10-months (Werker & Tees, 1984). However, research looking at acquisition with older children using word-learning tasks has found that 20-month-old children are less sensitive to vowels than consonants (Nazzi, 2005). This raises questions about the early representations for consonants versus vowels.

This research examines the neighborhood densities in children's developing lexicons for consonants and vowels. Rather than looking at children's ability to learn new words, we focus on the actual words in children's vocabularies. If children's early lexicons do not favor consonants or vowels, the proportion of neighbors should be equal. However, if consonants or vowels have a preferred status in the developing lexicon, then a preference should be seen for either in children's early vocabularies. That is, neighbors for either consonants or vowels will be denser.

## Lexical Analyses

Longitudinal data were taken from 10 children acquiring Dutch as a first language (Fikkert, 1994; Levelt, 1994). Children were between the ages of 1;0 and 2;11, and recordings were started at the first stages of word production. Analyses focused on children's productions of monosyllabic consonant-vowel-consonant words, e.g. *bed* 'bed'. Each child's lexicon was divided into three stages: 25-word stage, 50-word-stage and 75-word stage. For each child, the neighborhood density of every word at each stage was calculated and sorted for whether the neighbor was created from changing the consonant or changing the vowel. For example, *poot* 'leg' and *boot* 'boat' differ in the initial consonants; *boot* and *boom* 'tree' in the final consonants, and *boom* and *boem* 'bang' in the vowels.

For each child, the proportion of neighbors for consonants and vowels was calculated at each stage. To establish a baseline for the proportion of neighbors for consonants and vowels in the Dutch language, the neighbors for the same words were also calculated using a corpus of child-directed-speech (van de Weijer, 1998). Our results indicated that children's early lexicons are denser for vowels than for

consonants (.46 vs. .54); whereas the same words taken from the corpus of child directed speech are less dense for vowels versus consonants (.54 vs. .46). There was no significant difference in the proportion of neighbors for consonants and vowels across the 25-word stage, 50-word-stage and 75-word stage.

## Conclusion

By looking at the young words in children's early lexicons, an advantage can be seen for vowels over consonants. This suggests that young infants' attunement to the language-specific vowel categories of their language influences the types of words that children acquire in their early developing vocabularies. If children are more attuned to the vowels of their language, words that are distinguished based on their vowels have an advantage. This advantage might arise from having more detailed representations, or by having an advantage in that they can be processed faster and with increased accuracy. Similar effects are found in adult word recognition, where vowel information allows for more candidates than consonants (Cutler et al. 2000).

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