The role of function words in the development of word segmentation

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Introduction

1. Word segmentation is a problem
   • Infants hear utterances not isolated words (Brent & Siskind, 2001)
   • No language universal cues for segmentation
   • Possible cues for word boundaries
     o Bottom-up cues: segmental cues (transitional probability, phonotactics, phonological restrictions, allophonic variations), prosodic cues (stress, clause or phrase boundaries)
     o Top-down cues: known words (Bortfeld et al., 2005): 6-month-olds use known words (mommy, the, the babys name) to segment novel words
   • Infants use Top-down cues as well as Bottom-up cues

2. Function words can be known words to infants
   • Discrimination: Infants can distinguish between function and content words (Shi, Werker, & Morgan, 1999)
   • Segmentation:
     o Infant can segment function words from fluent speech (Hohle & Weissenborn, 2003): 7-9-month-old German-learning infants; Shi & Gauthier, 2005: 8-month-old French-learning infants.
     o For English-learning infants, 11-month-olds segment nonce word `breek` preceded by the but not a phonetically-matched kuh; 8-month-olds segment with the and kuh (Shi et al., 2006)
     o 8-month olds do not fully recognize details in any function words, and 11-month-olds do so only for frequent function words

3. Vowel-initial words segmentation
   • Vowel-initial word segmentation is more difficult than consonant-initial word segmentation (segmented only at 13.5-16-months, but when presented in sentence initial- or final-position, at 11-months, Seidl & Johnson, 2008)

Research Question

• Do function words facilitate the segmentation of vowel-initial words?

Methods

Participants
• 16 monolingual English-learning 11-month-olds (10 boys, 6 girls) and 17 8-month-olds (9 boys, 8 girls)

Procedure
• HPP (Headturn Preference Procedure)

Stimuli & Design
• Target words: eff, ash
• Control words: ice, oats
• Familiarization phase: passages containing [ði + target] phrase-medially (accumulated looking time of 45 seconds to each passage)
• Test phase: lists of words in isolation (multiple repetitions), 3 blocks of 4 trials each (total 12 trials)

Results

• 11 month-olds: Out of 16 infants, 14 listened longer to the target words. [t(15) = 4.204, p < .001]
• 8 month-olds: Out of 17 infants, 10 listened longer to the target words. [t(16) = 1.43, p = .134]

Conclusion

• Function words, especially frequently occurring ones, can facilitate 11-month-olds’ vowel-initial word segmentation.
• Function words do not facilitate 8-month-olds’ segmentation of vowel-initial words.
• Top-down cues may be sufficient for infants to segment vowel-initial words.

Follow-up Studies

• Do 11 month-olds use the function word or phonotactics (V#V)?
• Do 8 month-olds segment [the + vowel-initial word] as a unit?

Acknowledgements

We thank all the participants and UCLA Language lab members.

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Selected References