

Short communication

Beyond stop consonants: Consonantal specificity in early lexical acquisition

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Abstract

Previous research has shown that 20-month-old infants can simultaneously learn two words that only differ by one of their consonants, but fail to do so when the words differ only by one of their vowels. This asymmetry was interpreted as developmental evidence for the proposal that consonants play a more important role than vowels in lexical specification. However, the consonant/vowel distinction was confounded with another distinction, that of the continuous status of the phonemes used (discontinuous stop consonants versus continuous vowels). The present study investigated 20-month-olds' use of phonetic specificity while simultaneously learning two words that differ by a continuous consonant. The results obtained parallel those previously found for stop consonants, confirming the original claim of an asymmetry between the roles of consonants and vowels at the lexical level.

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Many recent studies have focused on infants' ability to use specific phonetic information in the process of learning new words during the second year of life, and on their ability to include such specific phonetic information in their early lexical representations. Evidence suggests that although some children produce mispronunciations until quite late in development, early lexical representations are specified to a certain extent. However, the bulk of the research in this domain has concentrated on plosive consonant contrasts, and extensions to other kinds of phonemic contrasts are now required. Accordingly, the aim of the present study was to evaluate whether 20-month-old infants can simultaneously learn pairs of words that differ only by one non-plosive consonant, and compare their performance to previous results obtained with the same procedure for plosive consonants and for vowels (Nazzi, 2005).

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Research on early phonetic specificity has witnessed renewed interest due to the proposal that vowels and consonants (considered as mutually exclusive sets of phonemes) might play different roles in language processing and acquisition (Nespor, Peña, & Mehler, 2003). More specifically, the proposal is that all consonants would be more important at the lexical level while all vowels would be more important at the prosodic and syntactic levels (while both types of phonemes would contribute to the morphosyntactic level).

The claim that vowels are more informative at the prosodic and syntactic levels comes from different domains. In particular, Nespor et al. (2003) note that vowels are the main carriers of prosodic information, and therefore play a crucial role in defining some basic linguistic distinctions such as the type of rhythm of a particular language, to which even newborns are sensitive (Nazzi, Bertonicini, & Mehler, 1998). Moreover, vowel-based prosodic information has also been found to provide cues about syntactic information (e.g., parsing of syntactic constituents, disambiguation of lexically ambiguous sentences, specification of relative order of head/complement syntactic parameter), which could be used by adults to process continuous speech and by infants to bootstrap syntactic acquisition (e.g., Christophe, Guasti, Nespor, & van Ooijen, 2003).

Similarly, the claim regarding the privileged implication of consonants at the lexical level is based on linguistic evidence that not only do consonants outnumber vowels in most languages (Crystal, 1997; Ladefoged & Maddieson, 1996), but also distinctiveness between consonants within a word tends to be maximized while it tends to be reduced for vowels (see for example the discussion on vowel harmony in Nespor et al., 2003). Further evidence, from the psycholinguistic domain, comes from studies showing that English, Dutch or Spanish adults asked to transform auditorily presented nonwords (e.g., kebra) into words tend to keep their consonants and change one of their vowels (e.g., cobra) rather than the other way round (resulting in, e.g., zebra; c.f., van Ooijen, 1996; Cutler, Sebastian-Galles, Soler-Vilageliu, & van Ooijen, 2000, for behavioral data, and Sharp, Scott, Cutler, & Wise, 2005, for converging PET scan data). Moreover, an artificial language learning experiment looking at French adults' ability to segment fluent speech showed that lexical transitional probabilities can be tracked in a context of fixed consonants and variable vowels, but not the other way round (Bonatti, Peña, Nespor, & Mehler, 2005).

The two lines of research above suggest that consonants matter more than vowels for lexical processing in adults. However, if consonants also play a more fundamental role than vowels at the lexical level during development, as proposed by Nespor et al. (2003), than one would predict that early lexical representations would be better specified in terms of consonants than in terms of vowels. Similarly, infants should be better able to pay attention to fine consonantal information while learning new words than to fine vocalic information. In the following, we review the literature on early lexical specificity for evidence related to these two predictions.

Many studies have investigated whether or not the lexical representations of words known by infants between the ages of 11 and 24 months are phonetically specified (for French: Hallé & de Boysson-Bardies, 1996; for English: Bailey & Plunkett, 2002; Fennell & Werker, 2003; Swingley & Aslin, 2000, 2002; Vihman, Nakai, DePaolis, & Hallé, 2004; for Dutch: Swingley, 2003). These studies show that early lexical representations are phonetically specified at least to a certain degree, infants often reacting differently to the presentation of a correct known word versus a mispronunciation of the same word. These studies further show that infants accept a certain degree of phonetic variation when hearing mispronunciations, as suggested by the fact that mispronunciation affects but does not entirely block comprehension. However, the evidence

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