Getting sound structures in mind

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Abstract

Research on early *speech production* has often argued that children's representations start out being holistic. They receive more phonological feature specifications in the course of development. In this talk, we will briefly review the arguments from early production for underspecified representations, and subsequently focus on two sets of *perception* studies, which both confirm the underspecified nature of children's early lexical representations.

If words are stored as highly abstract units, then the prediction is that for word recognition detailed phonetic information is not used either. Moreover, not only do underspecified representations lead to asymmetrical patterns in production, the asymmetry is expected to show up in perception as well. Children's discrimination abilities may be very accurate, but mapping the perceived features to stored lexical items is a different matter.

In the first set of experiments we replicated and expanded previous research by Werker and colleagues for Dutch. Werker and colleagues (1997, 2001, 2004), showed, using the switch procedure, that 14-month-old Canadian infants do not perceive the contrast in the pair of nonce words *bin-din* in a word learning task. However, they did perceive the same contrast in a pure discrimination task, as well as in the pair of well-known words *ball-doll*. Therefore they argue that infants perceive phonetic detail and at least have detailed representations for known words. In our experiments we tested two pairs of nonce words *bin-din* (experiment 1) and *bon-don* (experiment 2) in a word-learning condition. In addition, we tested children's behavior on *bin-din* in a pure discrimination task (experiment 3). Based on results from production, we hypothesized that words like *bon* and *don* at the onset of speech would have a labial representation, due to the labial vowel, and words like *din* and *bin* a coronal representation. Moreover, we predicted coronal to behave as underspecified.

Results from experiment 1 show that in the case of *bin – din*, Dutch 14-month-old infants do not listen significantly longer to the 'new' words than to the 'old' words, indicating that the difference between *bin* and *din* is not picked up. However, in the pair *bon – don* (experiment 2) infants did listen significantly longer to the 'new' than to the 'old' forms, suggesting that the *bon – don* contrast is perceived. Experiment 3 shows that children accurately discriminate *bin – din*. We argue that the difference between *bin – din* and *bon – don* is due to children's underlying representation of the perceived words: they store *bin – din* as (underspecified) [coronal], and *bon – don* as [labial]. The perceived coronal feature of the 'd' in *don* mismatches with the labial representation of the word. The 'b' in *bin* on the other hand does not mismatch with coronal as this is underspecified in the lexicon. In conclusion, the results from this perception experiment confirm our predictions and are conform the patterns attested in production.

In the second set of experiments, we investigated the nature of the phonological representations of well-known words in 24-month-old Dutch children, using a split-screen preferential looking paradigm. All test items were plosive-initial CVC words that were either

pronounced correctly (CP condition: *poes* as *poes*) or mispronounced (MPplace condition: *poes* as *toes*), which resulted in non-words. The results indicate that children's overall looking time in the CP condition is longer than in the MP condition. However, if we compare mispronunciations of labial and coronal initial words there is a clear asymmetry: children only look significantly shorter to mispronounced labial targets, but not to mispronounced coronal targets. We argue that this is due to the underspecified nature of coronals in children's phonological representations.

To summarize, the claims made with respect to the underspecified nature of phonological representations of early words based on children's production data are confirmed by the results of perception experiments involving word recognition in both word learning and word access tasks.