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Early Word Learning: How Infants Learn Words that Sound Similar

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Introduction

The development of both phonological perception and semantic acquisition has been well studied, yet the connection between these remains a mystery. Research in phonological perception has demonstrated that infants are born with the ability to make fine phonetic discriminations (Cristophe, Jacques, & Sebastian-Galles, 2001). However, word-learning research has suggested infants do not make use of this knowledge in learning similar sounding words (Werker & Tees, 2002). Why? The current study suggests that infants have detailed phonetic representations for newly acquired words but suppress this information under certain circumstances.

Method

Infants from the West Lafayette/Lafayette area were tested at four different ages: 14, 18, 22, and 26 months.

The present study used the splitscreen preferential looking paradigm. This paradigm presents two objects, one on each side of a screen while audio stimuli requests one of the objects. The experiment consisted of two sequences. The first sequence attempted to teach infants a novel word (e.g. “chab”) while the second sequence attempted to teach a second novel word that was phonologically similar to the previously taught word (e.g. “chas”). The auditory stimuli for this sequence were presented in a different voice (differing in gender) from the second sequence. The order of voices and specific words were counterbalanced across subjects.

Each sequence consisted of four types of trials. Infants first had a training trial where they were presented with a single object on the screen and the novel label for that object. This was always followed by a salience trial where the object the infant heard labeled was presented on one side of the screen and another object was presented on the other side. Auditory stimulus was played that was not intended to direct attention to either object (e.g. “What do you see?”). The infants then saw the two test trials (label and similar), the order of which were counterbalanced to control for order effects. In the label condition, the object that the infants saw in training was requested. In the similar condition, the similar word was requested. The logic of the procedure was that if infants learned the word in the test phase, they should look longer at it during the label trials than in the salience trials or the similar trials.

Results and Discussion

Although performance did increase with age, even at 14 months, infants looked significantly longer at the labeled object when it was requested during the first sequence. Furthermore, they did not look longer at the label object in the salience or similar trials. In those trials, infants looked longer at the unlabeled object. This switch in looking suggests that infants noticed and rejected phonetic differences when the voice was the same, demonstrating that they can make fine phonetic discriminations in the context of a word-learning task. However, infants did not notice the same phonetic differences when the talker was changed in the second sequence of trials.

There are two logical explanations for the results from the second sequence of trials. Perhaps infants pragmatically noticed the switch between voices and assumed that the phonetic differences in this case were not meaningful. This strategy may cause mislabeling when the task is to learn similar sounding words, but it may ultimately lead to more successful labeling in the real world where phonetic signals are more variable and normalization is key. Alternatively, it is possible that the task of attaching meaning to the second word caused the difficulty. Specifically, it is possible that infants lost track of which word went with which object (something even adults will do, on occasion). In this case, the switch in voice was irrelevant. Even if the voice had been the same, infants would have had the same difficulties in the second block of trials.

Ongoing studies are examining whether it was the change in talker or the learning of a second word that caused the difficulties in the second block of trials. However, the current results suggest that infants do possess fine phonetic distinctions in a word learning task, even at 14 months, and that they will ignore these distinctions when memory or pragmatic conditions dictate.

References

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