

Infants' learning of similar sounding words in noise

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Introduction

>As they become skilled word learners, infants can learn the meaning of words with subtle phonetic distinctions. (Werker et al. 2002). However, most of this work has focused on the performance of infants in ideal circumstances.

➢Both phonetic discrimination (Nozza, Rossman, Bond & Miller, 1990) and speech segmentation (Newman & Jusczyk, 1996) are impaired when linguistic stimuli are accompanied by even low levels of noise.

>This work examines infants' phonetic representation and word learning in a more realistic situation.

What effect does a noisy environment have on infants' ability to learn word meaning?

Method

Infants were tested at 14, 18, 22, and 26 months of age. They sat in a caregiver's lap while a camera recorded their looking responses.



Figure 1. The splitscreen preferential looking paradigm. Infants sit on a parent's lap 3' from a 56" projection display.

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Design

Infants heard a new word applied to an object 8 times in sentence form. The preferential looking method was then used to test whether infants had successfully mapped the word to the object. Familiar objects (book and ball) were second trial using a similar sounding word pair (chas and chab) with novel objects. Three orders were created for counterbalancing purposes. Half of the infants heard background white noise, 10db softer than the linguistic stimuli played during the experiment. Videos were coded frame-by-frame using a program written by the second author





Figure 2. Mean looking to the labeled objects across the trials, without noise. Infants looked longer at the requested stimuli in all trials, indicating successful word learning.



Figure 3. Mean looking to the labeled objects across the trials in 60dB white noise. Infants looked longer at the requested stimuli only in familiar trials.

- In the familiar trials, infants had the same significant pattern of looking with and without noise, suggesting they did not have a problem hearing the linguistic stimuli.
- For the novel trials, looking times were not significantly different, suggesting noise interfered with the ability to attach a novel label to a novel object.

Implications and Future Directions

- If no noise is present, infants are able to make fine phonetic distinctions while engaged in mapping tasks.
- Even low levels of noise (comparable to daycare and school situations (National Institutes of Health Consensus Conference,1990), impairs infants' ability to learn new words.
- Much of infants' exposure to language in the natural environment is accompanied by noise. We are currently examining the mechanisms that allow infants to learn words in noisy environments.