



Phonological awareness in preschoolers with hearing loss

Progress Report

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Introduction

Children's ability to produce and comprehend their native language is a complex and remarkable process. Later, children learn an equally complex application of their language--reading.

•A precursor to this important skill is the ability to learn to break apart the words they hear into smaller units; this knowledge is known as phonological awareness.

Phonological Awareness

•Normally, phonological awareness is the **strongest predictor** of reading ability when IQ and SES are controlled (Snowling, 1998).

•**Children with hearing loss** are part of a critical yet understudied population, especially in the realm of phonological awareness research.

•Research with 7-to-9 year-old children with hearing loss has shown that these children have phonological awareness skills **equivalent to younger** typically developing children, as well as delays in receptive vocabulary (Gibbs, 2004).

•However, these children with hearing loss **performed equivalently to their age-matched** typically-developing peers on reading ability (Briscoe et al., 2001; Gibbs, 2004).

•These results **contradict much of the literature** suggesting that phonological awareness is a predictor of reading skills; however, little research has been conducted on a **younger population of children with hearing loss** who have not yet been taught to read.

Phonotactic Probability:

•A component of phonological awareness--**phonotactic probability**--measures the likelihood of the occurrences of a sound sequence in a language (Storkel, 2001).

•Typically-developing preschoolers learned novel non-words with high probability sound sequences (like "pl") **more quickly** than non-words with low-probability sound sequences (like "dl").

•This implies that these children were **aware of the common sounds** in their language (Storkel, 2001).

Current Study

•Goal: To investigate phonotactic probability knowledge in preschoolers with hearing loss, allowing the exploration of phonological awareness in an important but understudied population.

Research Question: How do preschoolers with hearing loss differ from those who are typically-developing on a novel word learning task that targets implicit phonological awareness knowledge?

Hypotheses

•Hx 1: Preschoolers who are typically-developing will **more easily learn novel words with high-probability** sound sequences than words with low-probability sequences.

•Hx 2a: Preschoolers with hearing loss will **have greater difficulty learning both types of novel words**, and will show a smaller difference in learning between the high- and low-probability words than the typically-developing group.

•Hx 2b (alternative): There will **no difference** between the performance of the preschoolers with hearing loss and those who are typically-developing.

Methods

Participants: Two groups

- 3-to-5 year old children (N=15)
 - Children with hearing loss (N=2)
 - Children who are typically-developing (N=13)

Two Conditions (between-subjects)

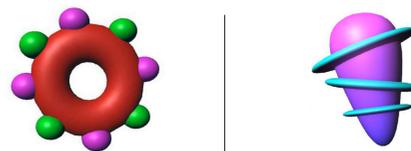
- high probability novel words (N=8): *kwat* and *pleeg*
- low probability novel words (N=7): *pwat* and *tleeg*

Procedure

•8 novel training trials: 4 for each novel word; each label paired with one novel object (see below) based on condition.

•4 familiar training trials: 2 for each familiar word, *ball* and *shoe*.

Training: Looking-while-listening task



High-probability condition:

"Look at the *kwat*!" | "Look at the *pleeg*!"

Low-probability condition:

"Look at the *pwat*!" | "Look at the *tleeg*!"

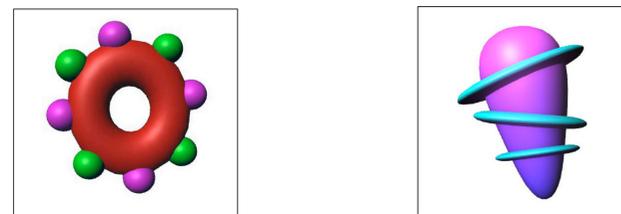
Methods, cont.

•12 test trials: 4 for each novel object, 2 for each familiar object.

•For each trial, 2 objects appeared on the screen: either 2 novel or 2 familiar

•These objects were paired with a novel or a familiar label.

Test trial example (in high-probability condition)



"Where's the *pleeg*? Can you see the *pleeg*?"

Off-line coding

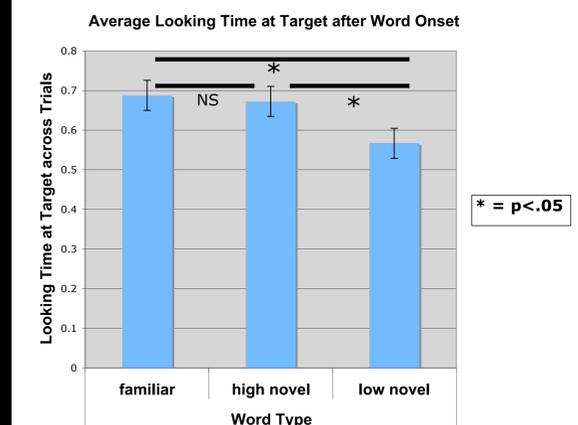
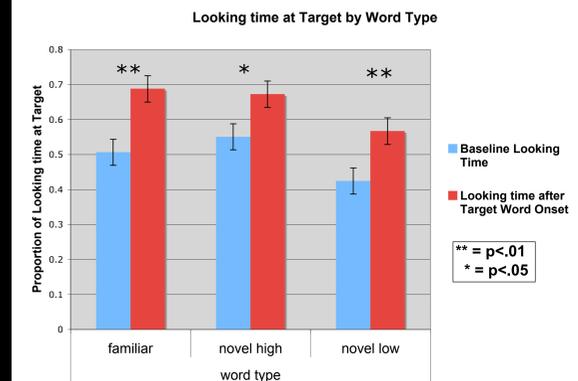
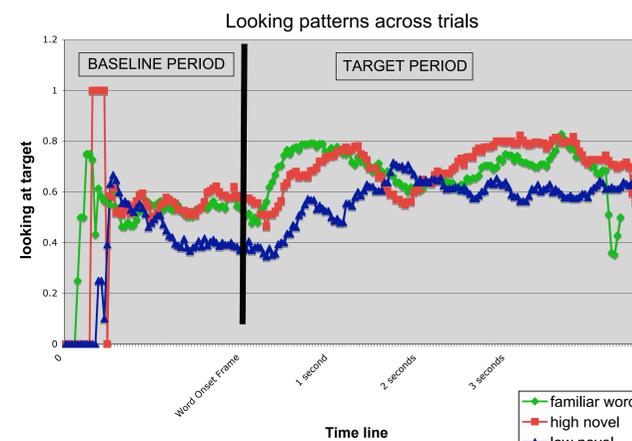
•The duration of the child's gaze at either the left or the right picture was coded frame-by-frame.

•Coding software measured the proportion of increase in target fixation; this measures duration of gaze at the target as soon as the label begins in the sentence.

Preliminary Results

Typically-developing preschoolers

•*Independent-sample t-tests*: to determine if increase in looking time from the baseline period to the period after target word onset was significant.



Discussion

•According to these results, the children significantly **increased their looking time** at the target object after the word onset in each condition; in addition, the children looked equally as long at the high-probability non-words as the familiar words, but looked significantly less at the low-probability non-words, showing **support for Hypothesis 1**.

•This finding suggests that the **difference** in the ability to more easily learn high-probability, but not low-probability, labels is due to the **children's ability to attend to the fine detail in complex words**--the phonotactic probability differences; typically developing preschoolers can recognize the commonly used sounds in their language and use them to easily learn new words.

•*Data are still being collected for the group of children with hearing loss; results are pending, but show support for Hypothesis 2a.*

References

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