Evaluating an Implicit Measure of Phonological Awareness in Preschool Children

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BACKGROUND

**Rationale**

- Phonological awareness (PA) is a strong correlate and early indicator of reading and writing achievement in school-age children.
- Current paradigms can reliably evaluate PA skills at age 5 using explicit phonological manipulation tasks, as in:
  - Standardized measurements such as the Comprehensive Test of Phonological Processing (CTOPP -2) (Wagner et al., 2013).
  - Informal assessments of word blending and word segmenting.
- However, it is difficult to use such explicit measures to assess PA at age 3.
- There are several well known correlates of PA including:
  - Vocabulary (expressive and receptive) and speech perception.
  - PA at age 3.

**Methods**

**Stimuli**

- A subset of children (24 of 200) from an ongoing longitudinal study.
- Ages: 3.0 (+/- 2 months) at time 1 and 4.0 (+/- 1 month) at time 2.
- Monolingual English speakers with typical speech and language development.

**Procedure**

- On each trial, each of a pair of images presented and named by the computer and audio stimulus were presented and named by the child was asked to "Say what the computer said."
- Each target nonword was paired with a picture of an unfamiliar object in a picture-prompted auditory-word-repetition task.
- Accuracy, the frequency effect.

**Results**

**Nonword Repetition Task**

- Stimuli were 22 pairs of nonsense words adapted from Edwards et al., 2004.
- Each pair included a 2-phoneme sequence that contrasted in phonotactic probability (e.g. high frequency /fr versus low frequency /fc).
- Stimuli were recorded in both Mainstream American English (MAE) and African American English (AAE).
- Children were presented the stimuli that matched their native dialect.
- Each target nonword was paired with a picture of an unfamiliar object in a picture-prompted auditory-word-repetition task.
- "tweeter"

**Expressive Vocabulary**

- The effect of phonotactic probability on nonword repetition accuracy (frequency effect) was quantified by:
  - Subtracting the mean scores for the low-frequency sequences from the mean scores for the high-frequency sequences.
  - Linear regression was used to evaluate what measures predicted PA at age 4.
  - Dependent variable: CTOPP -2 Evt scaled score.
  - Independent variables: PPVT -4 standard score, EVT -2 standard score, Minimal Pairs % correct, nonword repetition accuracy, the frequency effect.

**Analysis**

- The effect of phonotactic probability on nonword repetition accuracy (frequency effect) was quantified by:
  - Subtracting the mean scores for the low-frequency sequences from the mean scores for the high-frequency sequences.
  - Linear regression was used to evaluate what measures predicted PA at age 4.
  - Dependent variable: CTOPP-2 Elision scaled score.
  - Independent variables: PPVT -4 standard score, EVT -2 standard score, Minimal Pairs % correct, nonword repetition accuracy, the frequency effect.

**Discussion**

- The results suggest that improving speech perception skills at age 3 may result in better PA at age 4. We plan to explore this claim further using SEM when the remaining participants have been tested at age 4.

**Summary and Discussion**

- The results in analysis 6 suggest that we do not yet have an implicit measure of PA that can be used for children at age 3.
- A measure of speech perception (minimal pairs task) at age 3 accounted for a substantial proportion of the variance in PA at age 4.
- Previous studies have focused on receptive vocabulary as opposed to expressive vocabulary. This study showed that expressive – rather than receptive – vocabulary at age 3 predicted more of the variance in PA.

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