Word Learning and Habituation in 18-Month Olds

Erica M. Ellis and Julia L. Evans, Ph.D. CCC-SLP
San Diego State University/University of California, San Diego
Joint Doctoral Program in Language and Communicative Disorders

Abstract

The purpose of this study was to investigate the relationship between word learning abilities and vocabulary levels in young children. The ability to habituate and attach meaning to newly segmented words was examined in typical and at-risk vocabulary groups. Preliminary results suggest there are qualitative differences between groups in the ability to attach meaning to novel words and degree of learning. Findings may provide information regarding how children are identified at risk for language delay.

References:


Thal, D. R., & Saffran, J. (2003). Newborn infants are sensitive to speech that resembles adult speech. Developmental Psychology, 39, 104-110.

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Background and Purpose:

Novel word learning in SLI

Children with Specific Language Impairment (SLI) have difficulty learning language despite normal nonverbal IQ.

- Children with SLI have lower vocabularies than typical peers.
- Late Talkers and children with SLI are poor at novel word learning tasks (Ellis & Saffran, 2001).

Typical 18 Month Old word learning

- 17-month-olds can learn three word boundaries that can subsequently map to novel meanings (Graf, Ellis, Evans, & Saffran, 2007).

Late Talkers

- Typically developing children acquire language rapidly and effortlessly, but some children do not. These children, often referred to as Late Talkers, are usually identified at about 24 months of age by parent report (Ellis & Thal, 2008).

In past research Late Talkers have been identified in many different ways, for example, by being below the 10th percentile in language abilities; having less than 50 word productive vocabulary; very few, if any, word combinations; and are at risk for continued language impairment (Ellis & Thal, 2008).

To date the best predictors of SLI are composite measures of: (1) family history of language impairment, (2) delay in language comprehension and production, and (3) low word scores (Ellis & Thal, 2008).

Are learning patterns delayed in children at risk for SLI?

- Findings may provide information regarding how children are identified at risk for language delay.

Habituation and novelty paradigm

- Infants learning repeated presentations of a stimulus should show a familiarity preference prior to a novelty preference (Hunter & Ames, 1988).

- Preferences can be dependent on the infants age, complexity of task or stimulus and processing time.

- Infants more likely to show familiarity preference when task is difficult (Thal & Saffran, 2003).

Are all young children show the novelty preference when expected?

- Two groups of 18 month-old toddlers (N = 48) *
- Participants were divided into two groups based on a screening of language abilities.
- Grouping was done using the bayley MDI; 17-19 mos.

- MB-CDI: WG gestures
- MB-CDI: WS Words
- MB-CDI: WG words
- Comprehended
- MB-CDI: WG gestures
- MB-CDI: WS words produced and p value

- The current study will investigate the earliest part on word learning -- linking the meaning to the object experiences.

Overview of methods

- Infants participated in a novel object-label habituation phase.
- Infants were exposed to one of two object-word pairings, one at a time in the habituation phase.

- The two groups did not differ in the number of trials to reach habituation.
- Prior to the visit, parents were sent the MB-CIDI WG WS forms.

- Forms were scored and child language percentiles were calculated after the testing.

Table 1: Means and Standard Deviations for the Low Vocabulary and Typical groups for the Weekly MDI, composite scores, MB-CIDI WG words produced and p value

Methods

Inclusion/Exclusion Criteria:

- Participants: Two groups of 18-month-old toddlers (N = 48) *
- Low Vocabulary (Low Vocabs): 1-19th percentile on language abilities; had less than a 50 word productive vocabulary; did not pass the bayley MDI; nonverbal items, MB-CDI:WS words produced and p value.

- The current study will investigate the earliest part on word learning -- linking the meaning to the object experiences.

- Infants learning repeated presentations of a stimulus should show a familiarity preference prior to a novelty preference (Hunter & Ames, 1988).

- Preferences can be dependent on the infants age, complexity of task or stimulus and processing time.

- Infants more likely to show familiarity preference when task is difficult (Thal & Saffran, 2003).

- Do all young children show the novelty preference when expected?

- Fast Mapping and Looking Paradigm
- The current study will investigate the earliest part on word learning -- linking the meaning to the object experiences.

- To compare groups, we controlled the prior experience by exposing the groups to a novel statistical language.

- Using the same paradigm as Graf, Ellis, et al. (2007), do 18-month-old infants with low vocabulary — after the same exposure to the target novel words in statistical learning stimuli — perform the same as typically developing age and novel control matched children on a novel word learning task?

- Do they require the same number of trials to habituation?
- Do they show particular patterns (novelty preferences) during testing?

- Does learning patterns differ between groups to a novel statistical language?

- Are there differences in preferences by group?

- Test Phase
- Immediately following habituation phase, infants learning of object-label pairs was examined using a Same/ Switch trial paradigm.

- Children presented with two types of pairings, one at a time in a random order.

- 1. Same - Trials where the original object-word pairing from the habituation phase was maintained (N = 4 trials)
- “Dobu”
- “Timbu”

- 2. Switch - Trials where original object-word pairings from habituation phase were switched. (N = 4 trials)

- Test Procedure
- The two groups did not differ in the number of trials to reach habituation.
- Infants showed a familiarity preference (Figure 4b).

- No difference in look times to Same trials for Low Vocabs and TD children showing Novelty preference (Figure 4a).

- No difference in look times to Switch trials for Low Vocabs and TD children showing Novelty preference (Figure 4b).

- Differences in Comprehension and Gesture CIDI scores for Low Vocabs Novelty group as compared to Low Vocabs Familiarity group.

- No difference in Comprehension and Gesture CIDI scores for TD Novelty or Familiarity groups (Figure 5).

- Table 1: Means and Standard Deviations for the Low Vocabulary and Typical groups for the Weekly MDI, composite scores, MB-CIDI WG words produced and p value

- Figure 1a. Number of trials to habituation
- Figure 1b. Duration of habituation

- Figure 2a. Number of trials to Switch
- Figure 2b. Duration of Switch

- Summary
- Typically developing 18-month-old data replicates prior work of Graf, Ellis, et al. (2007).

- As a group, Low Vocabs infants showed different pattern of learning
- Same number of trials to habituation as Typical infants.

- No difference between look times to same versus switch trials

- Low Vocabs - Familiarity preference infants similar CIDI Comprehension and Gestures scores as TD infants.

- Low Vocabs - Novelty preference infants significantly lower CIDI Comprehension and Gestures scores

- Future research needs to examine these qualitative differences in "Novelty" preference infants at risk for SLI.