Interactions between Phonotactic Constraints and Probabilities in Word Learning

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Introduction

- Word learning by typically developing children is influenced by phonological characteristics of the words to be learned
- **Phonotactic Constraints:** Rules defining which sounds and sequences are legal in the child's developing system
  - In (e.g., /m/) vs. Out (e.g., /r/)sounds
  - In facilitates word learning in very young children (Leonard, Schwartz, Morris, & Chapman, 1981; Schwartz & Leonard, 1982)
- **Phonotactic Probability:** Likelihood of occurrence of sound sequences
  - Common (e.g., 'coat') vs. Rare (e.g, 'watch')
  - Common facilitates word learning in preschool and school-age children (Storkel, 2001, in press; Storkel & Rogers, 2000)

Experimental Questions

- Do phonotactic constraints continue to influence word learning in older children?
- Do phonotactic constraints interact with phonotactic probability?
- Are similar effects observed in children with normal versus delayed phonological development?

Method

- Participants: 3 Groups of preschool children

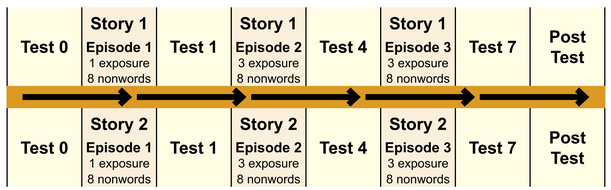
	Phonological Delay	Normal Comparison: Out	Normal Comparison: In
Number	17	24	22
Target In Sounds	Correctly Articulate "In"	Correctly Articulate "In"	Correctly Articulate "In"
Target Out Sounds	**Misarticulate "Out"**	**Misarticulate "Out"**	Correctly Articulate "In"
GFTA Raw	**M = 31**	**M = 23**	M = 4
Age	**M = 5;0**	M = 3;10	**M = 4;10**
PPVT Raw	**M = 71**	M = 56	**M = 78**
EVT Raw	**M = 53**	M = 44	**M = 57**

Method cont.

- Stimuli: 16 CVC nonsense words paired with unfamiliar objects

	Form: Common	Form: Rare	Referent: Item 1	Item 2	Item 3	Item4
Out	roʊf					
		θum				
In	mæb					
		gɔɪt				

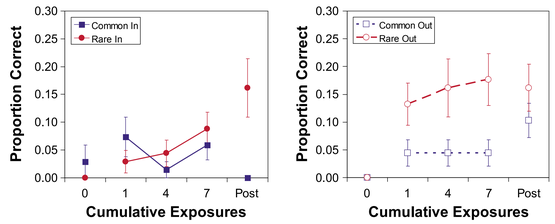
- Form-referent pairs were randomly assigned to 1 of 2 stories
  - Phonotactic Constraints x Phonotactic Probability conditions were balanced across stories.
- Procedure



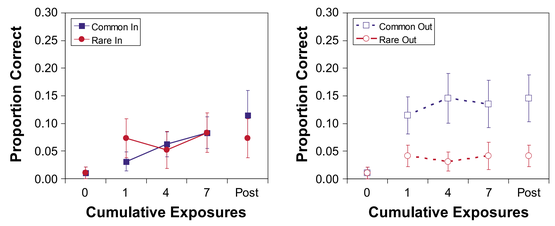
  - Test = Picture naming
    - Correct = 2 of 3 phonemes correct
    - Incorrect = all other productions

Results

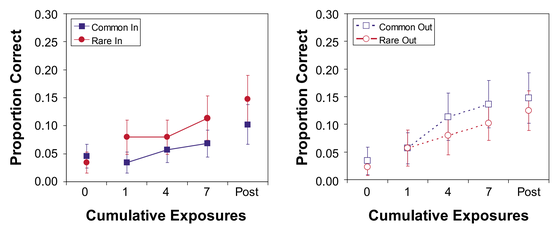
- Out PD Group: Significant interaction of Phonotactic Constraint x Phonotactic Probability x Exposure



- Out NC Group: Significant interaction of Phonotactic Constraint x Phonotactic Probability



- In NC Group: No significant effects



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www.ku.edu/~wrdlrng/

Conclusion

- Phonotactic constraints continued to influence word learning in preschool children, but not in the same way as in younger children
  - Infant/Toddler: In > Out
  - Preschool: Out > In
- Phonotactic constraints interacted with phonotactic probability
  - In: Decreased effect of phonotactic probability
  - Out: Increased effect of phonotactic probability
- Effect of phonotactic probability varied by group
  - PD: Rare > Common
  - CN: Common > Rare
  - Children with delayed phonological development may rely on **lexical** representations to learn new words
  - Children with normal phonological development may rely on **phonological** representations to learn new words

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