

Word Learning II: Experimental Word Learning in Children with Phonological Delays

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Phonological Characteristic

- Phonotactic Probability (Vitevitch & Luce, 1999)
 - Characteristic of individual sounds
 - The frequency with which a particular sound or sound pattern occurs in a language
- Common → “coat”
- Rare → “watch”

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Phonotactic Probability

- Positional Segment Frequency:
 - The likelihood of occurrence of individual sounds in a given word position
 - e.g., /f i t/
- Biphone Frequency:
 - The likelihood of occurrence of a pair of sounds
 - e.g., /f i t/ or /f i t/

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Lexical Characteristic

- Neighborhood Density (Luce & Pisoni, 1998)
 - Characteristic of whole word forms
 - The number of similar sounding words based on a one sound substitution, addition, or deletion.
 - e.g., /f i t/
 - /tj i t/ /f l i t/ /i t/
 - Dense → “sit”
 - Sparse → “these”

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A Relationship Exists

- Phonotactic probability and neighborhood density are correlated (Vitevitch et al., 1999; Storkel, 2004).
 - Common sound sequences ~ dense neighborhoods
 - e.g., “coat” “sit”
 - Rare sound sequences ~ sparse neighborhoods
 - e.g., “watch” “these”

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Preschool Word Learning

- Previous studies using correlated stimuli have found different results for different groups of children

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Typical Language Development

- Typically developing (TD) children learn common/dense > rare/sparse (Storkel, 2001, 2003, 2004; Storkel & Rogers, 2000)

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Phonological Delay

- Phonological Delay:
 - Breakdown in production and/or knowledge of the sound system with otherwise typical development
- Children with phonological delays (PD) learn rare/sparse > common/dense (Storkel, 2004)

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Purpose

- To examine the unique contributions of phonotactic probability and neighborhood density to word learning by including correlated and dissociated stimuli
- Further investigate differences between TD and PD groups
 - Effect of neighborhood density?
 - Effect of phonotactic probability?

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Participants

	Age	GFTA Raw Score	ROWPVT Raw Score	EOWPVT Raw Score
+*PD (N=22)	60 (41-79)	35 (20-51)	59 (33-81)	56 (34-72)
+TD (N=15)	54 (38-68)	8 (0-28)	62 (47-84)	57 (34-81)

*All children were WNL on hearing

*Children in the PD group scored WNL on an omnibus language test, oral motor test, and nonverbal IQ

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Stimuli

Correlated	Correlated	Dissociated	Dissociated
Common-Dense	Rare-Sparse	Common-Sparse	Rare-Dense
jæt	nib	paɪb	haʊd
wu:n	hub	jaʊn	nʌd
paʊn	tɔɪm	mɛb	wʊd
nɪd	wʌp	hʌn	jeɪm

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Procedure

- Nonword stimuli were paired with novel object referents from 4 semantic categories
 - Toys, pets, candy, musical instruments
- Embedded in the context of a three-episode story
- Number of exposures increased with each story episode
- Picture Naming

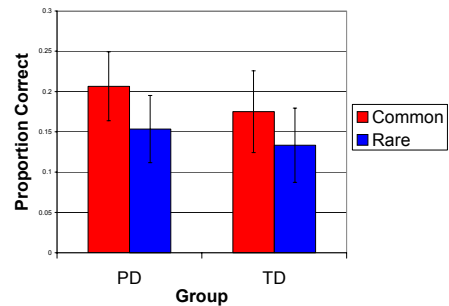
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Preliminary Results

- 2 neighborhood density x 2 phonotactic probability repeated measures ANOVA
- Near significant main effect of phonotactic probability
 - $F(1, 35) = 3.147, p = .08$
 - Common > Rare
- No interaction with group
- No effect of neighborhood density

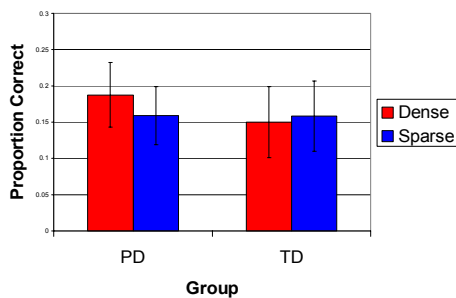
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Phonotactic Probability



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Neighborhood Density



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Preliminary Conclusions

- Phonotactic Probability
 - Common sound sequence advantage across both groups
 - Children with TD & PD use phonological information in an immediate word learning context

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Preliminary Conclusions

- Neighborhood Density
 - No effect of neighborhood density across groups
 - More important to long term as opposed to immediate word learning

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Integration with Previous Research (Storkel, 2004)

- Correlated stimuli → group differences
 - TD: Common/Dense > Rare/Sparse
 - PD: Rare/Sparse > Common/Dense
- Dissociated stimuli → no group differences
 - TD & PD: Common > Rare with no effect of neighborhood density

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Storkel (2004) vs. Current Study

- Phonological similarity of stimuli
 - Storkel, 2004 → phonologically similar stimuli
 - 4 repeated onsets per story
 - 0 unique onsets per story
 - Same onsets repeated across stories
 - Current study → phonologically dissimilar stimuli
 - 2 repeated onsets per story
 - 4 unique onsets per story
 - Different onsets repeated across stories

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