

***Research to Practice:***  
**Influence of Form Characteristics**  
**on Word Learning**

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# Children Rapidly Acquire Words

- Diary/Checklist
  - Add ~2-5 words per day (expressive)
  - Add ~9 words per day (receptive)
- Fast mapping
  - Associate form with referent with 1 exposure
- Extended mapping
  - Initial representations retained and modified with subsequent exposure

# Why so fast?

- **Constraint Account**
  - Born with innate principles
- **Associationistic Account**
  - Learn regularities in the environment
- **Emergentist Coalition Account**
  - Innate principles help learn first words
  - Extract cues or regularities from learned words
  - New principles emerge

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# Phonological Regularities: Phonotactic Probability

- Likelihood of occurrence of sound sequence
  - Common = sounds frequently occur in that word position; Adjacent sounds frequently co-occur
  - Rare = sounds infrequently occur in that word position; Adjacent sounds infrequently co-occur
- Common (e.g., “coat”) vs. Rare (e.g., “watch”)
- See Storkel & Morrisette (2002), LSHSS, 33 (1), 24-37 for review

# Phonotactic Probability Influences:

- Word recognition and memory in adults  
(e.g., Frisch, Large, & Pisoni, 2000; Vitevitch & Luce, 1998; 1999)
- Nonword repetition in childhood  
(e.g., Beckman & Edwards, 1999; Gathercole et al., 1999)
- Word learning in typically developing children  
(e.g., Storkel, 2001, 2003, 2004; Storkel & Rogers, 2000)
- Common > Rare

# Does phonotactic probability influence word learning by children with phonological delays?

Storkel (2004), JSLHR,  
47 (5)

















# Participants

	Phonological Delay (PD)	Normal Comparison (NC)
Number	20	24
Age	5;0	3;10
PPVT-3 Standard Score	105	106
EVT Standard Score	105	107
GFTA-2 Percentile Rank	10	41



# Stimuli

- 16 CVC nonsense words
  - ½ common
  - ½ rare
- Paired with unfamiliar objects
- Incorporated into narrative and pictures

	Form		Referent			
	Common	Rare	Item 1	Item 2	Item 3	Item 4
Known	mæb	goit				
						
Unknown	rouf	θum				
						

# Procedure

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<b>Test 0</b>	<b>Story 1</b>	<b>Test 1</b>	<b>Story 1</b>	<b>Test 2</b>	<b>Story 1</b>	<b>Test 3</b>	<b>Test 4</b>
	<b>Episode 1</b>		<b>Episode 2</b>		<b>Episode 3</b>		
	1 exposure 8 stimuli		3 exposures 8 stimuli		3 exposures 8 stimuli		

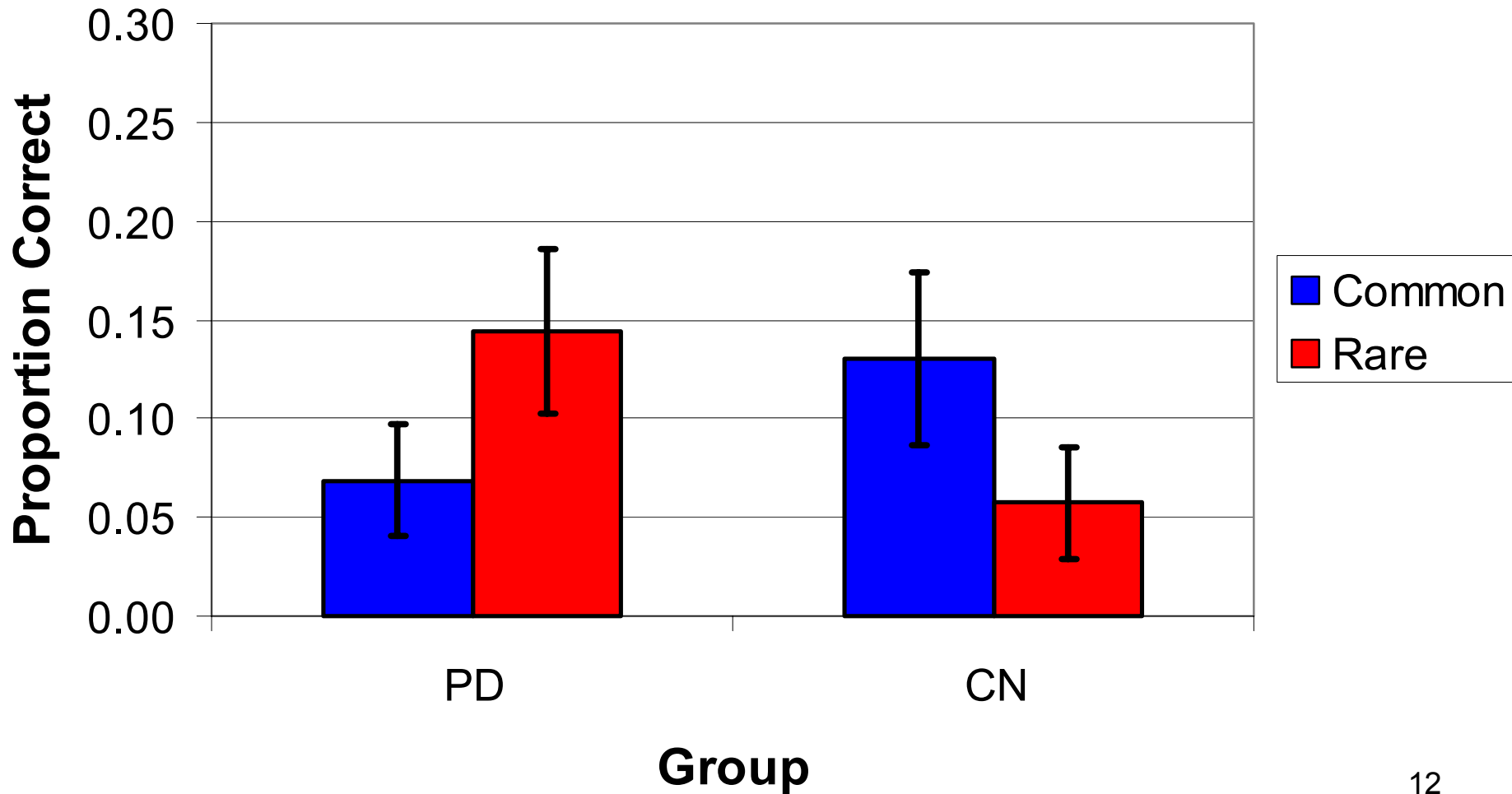
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<b>Test 0</b>	<b>Story 2</b>	<b>Test 1</b>	<b>Story 2</b>	<b>Test 2</b>	<b>Story 2</b>	<b>Test 3</b>	<b>Test 4</b>
	<b>Episode 1</b>		<b>Episode 2</b>		<b>Episode 3</b>		
	1 exposure 8 stimuli		3 exposures 8 stimuli		3 exposures 8 stimuli		

- Picture Naming



# Naming Correct at Post-Test



# Storkel (2004) Summary

- PD & CN groups learned a similar number of words, BUT
  - PD group learned rare sound sequences
  - CN group learned common sound sequences
- PD group may have difficulty differentiating common sound sequences
- PD lexicon may differ from the CN lexicon

# Both groups scored within normal limits on vocabulary tests

Vocabulary tests may not be sensitive to underlying word learning mechanisms

# Standardized Vocabulary Tests

- Reportedly insensitive to word learning differences  
(e.g., Gray, Plante, Vance, & Henrichsen, 1999)
- May be culturally biased
- Examine the *products*, not the *process* of learning  
(e.g., Dollaghan & Campbell, 1998)
  - Represents exposure & ability

**Can the sensitivity of vocabulary tests  
be improved by examining the types  
of words that kids know?**

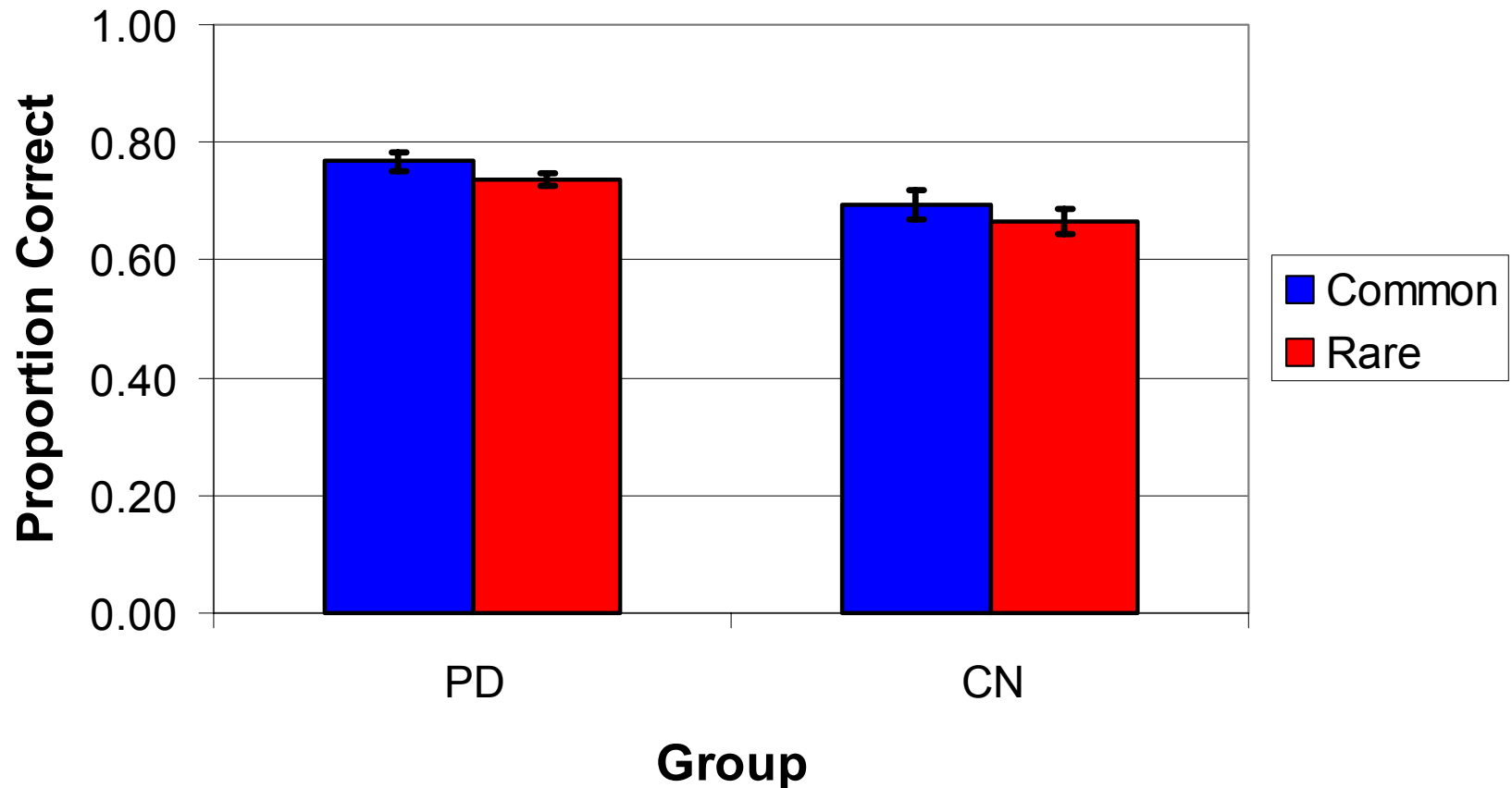
Storkel & Perdue  
(in progress)



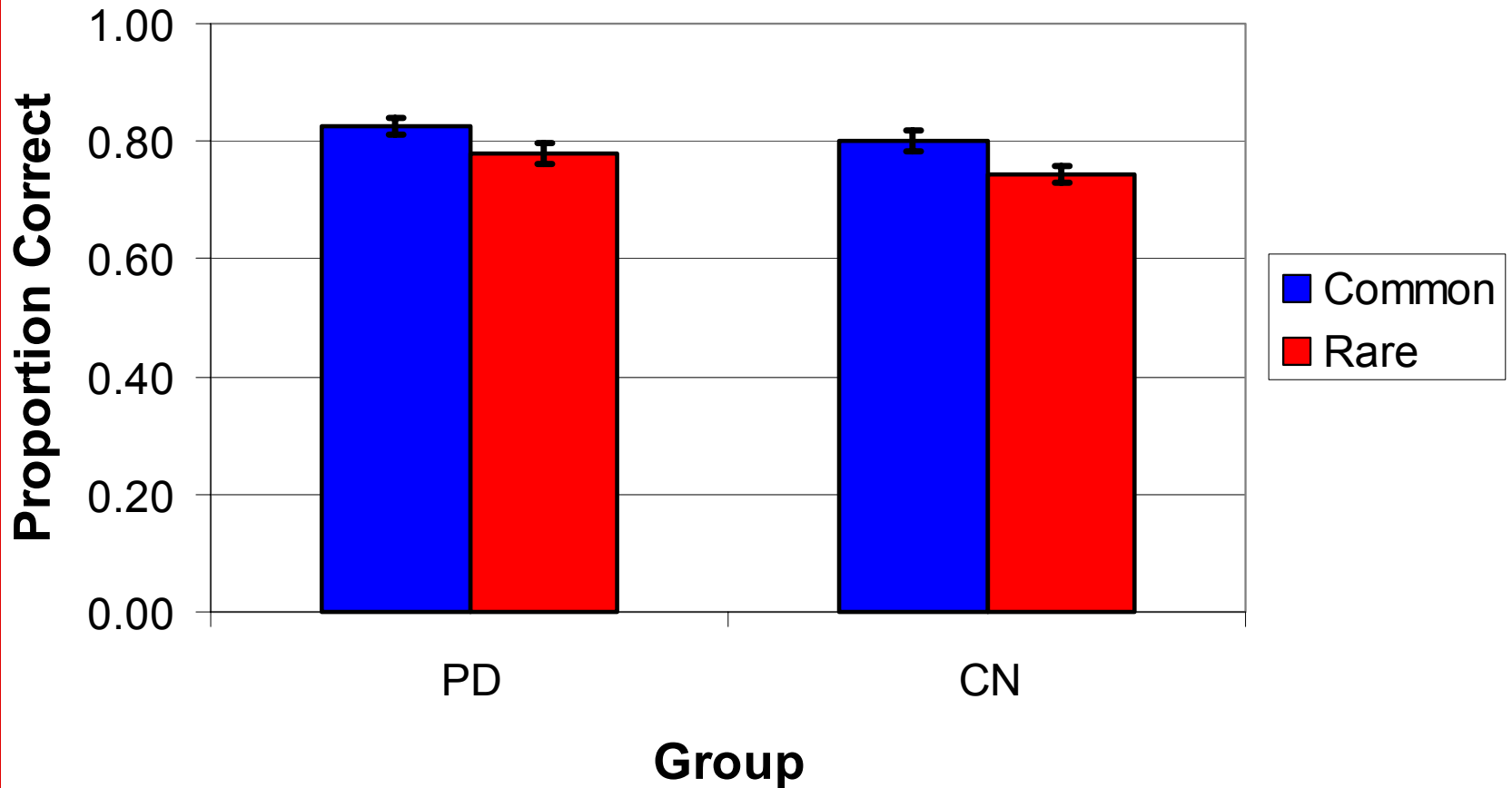
# Examine Phonotactic Probability Subscale Scores

- Peabody Picture Vocabulary Test – 3A  
Expressive Vocabulary Test
- Code items as common or rare
- For each child, compute
  - % Common correct
  - % Rare correct

# Peabody Picture Vocabulary Test - 3A



# Expressive Vocabulary Test



**Are these subscale scores better predictors of word learning than overall scores?**

Regression Analysis

Predictors:

CA, PPVT raw, PPVT common, PPVT rare, EVT raw, EVT common, EVT rare

# Significant Predictors of Word Learning

	PD	CN
Common	PPVT rare	PPVT raw score EVT common
Rare	∅	PPVT raw score

## Summary: Utility of Subscale Scores

- Show promise in predicting word learning in typically developing children
- Warrant further exploration
  - Not all outcomes were as expected
  - For PD, PPVT rare predicted learning of common
- Need to consider how correlated variables may affect outcome
  - Tests not designed to investigate phonotactic probability

# Alternative Processing Measures

- Nonword repetition
- Nonword processing task  
(Storkel & Hoover, in progress)
- Still need sensitivity to factors that influence word learning

# Conclusion

- Findings from basic science research can be used to build better diagnostic tools
- Increase the sensitivity of diagnostic tools
- Influence treatment planning in a more direct way



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