

# Phonotactic Probability and Grammatical Class in 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 sound sequence with referent with 1 exposure
- Quick Incidental Learning
  - Form associations in discourse

# Why so fast?

- Constraint Account
  - Born with innate principles
- Associationistic Account
  - Learn regularities in the environment
- Social-Pragmatic Account
  - Social context narrows interpretations
- Emergentist Coalition Account

# Associationistic Account

- Initial word learning is slow
- First words give children a sample of distributional regularities
- Children learn the regularities
- Knowledge of regularities leads to fast word learning

# Phonological Regularities

- Phonotactic probability
  - Likelihood of occurrence of a sound sequence
  - Positional segment frequency
  - Biphone frequency
- Common sound sequences
  - e.g., “sit” /sɪt/
- Rare sound sequences
  - e.g., “these” /ðɪz/

# Phonotactic Probability

- **Learned early in development**  
(e.g., Jusczyk, Luce, & Charles-Luce, 1994; Saffran, Aslin, & Newport, 1996)
- **Influences nonword repetition in childhood**  
(e.g., Beckman & Edwards, 1999; Gathercole et al., 1999)
- **Influences word recognition and memory in adults**  
(e.g., Frisch, Large, & Pisoni, 2000; Vitevitch & Luce, 1998; 1999)

# Overview

- Evidence that children learn phonotactic probability
- Question: Does phonotactic probability influence word learning?
  - Study 1: Noun learning
  - Study 2: Verb learning



# Study 1





## (Storkel, 2001)

- Do pre-school children learn objects associated with common sound sequences more rapidly than objects associated with rare sound sequences?
- Does this vary across exposures and delays?

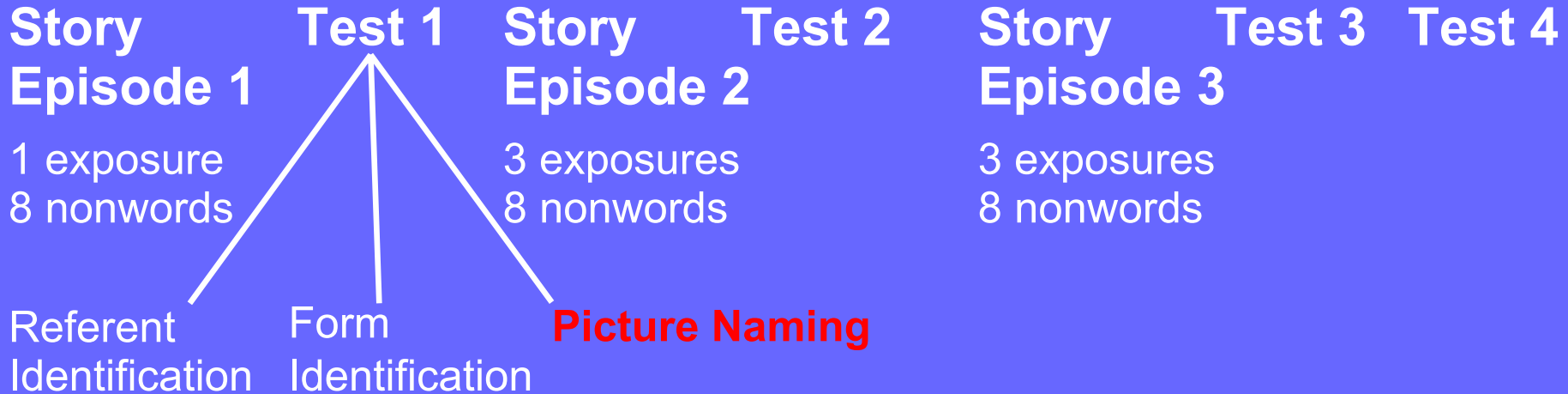
# Method

- Participants: 34 children
  - Age 3 - 6 yrs (M = 4; 6)
  - *GFTA* 32<sup>nd</sup> - 99<sup>th</sup> percentile (M = 70)
  - *PPVT-R* 30<sup>th</sup> - 99<sup>th</sup> percentile (M = 74)
- Stimuli: 8 CVC nonwords
  - 4 common vs. 4 rare sound sequences

# Sample Stimuli

Form		Referent	
Common	Rare	Item 1	Item 2
kouf			
	jeip		

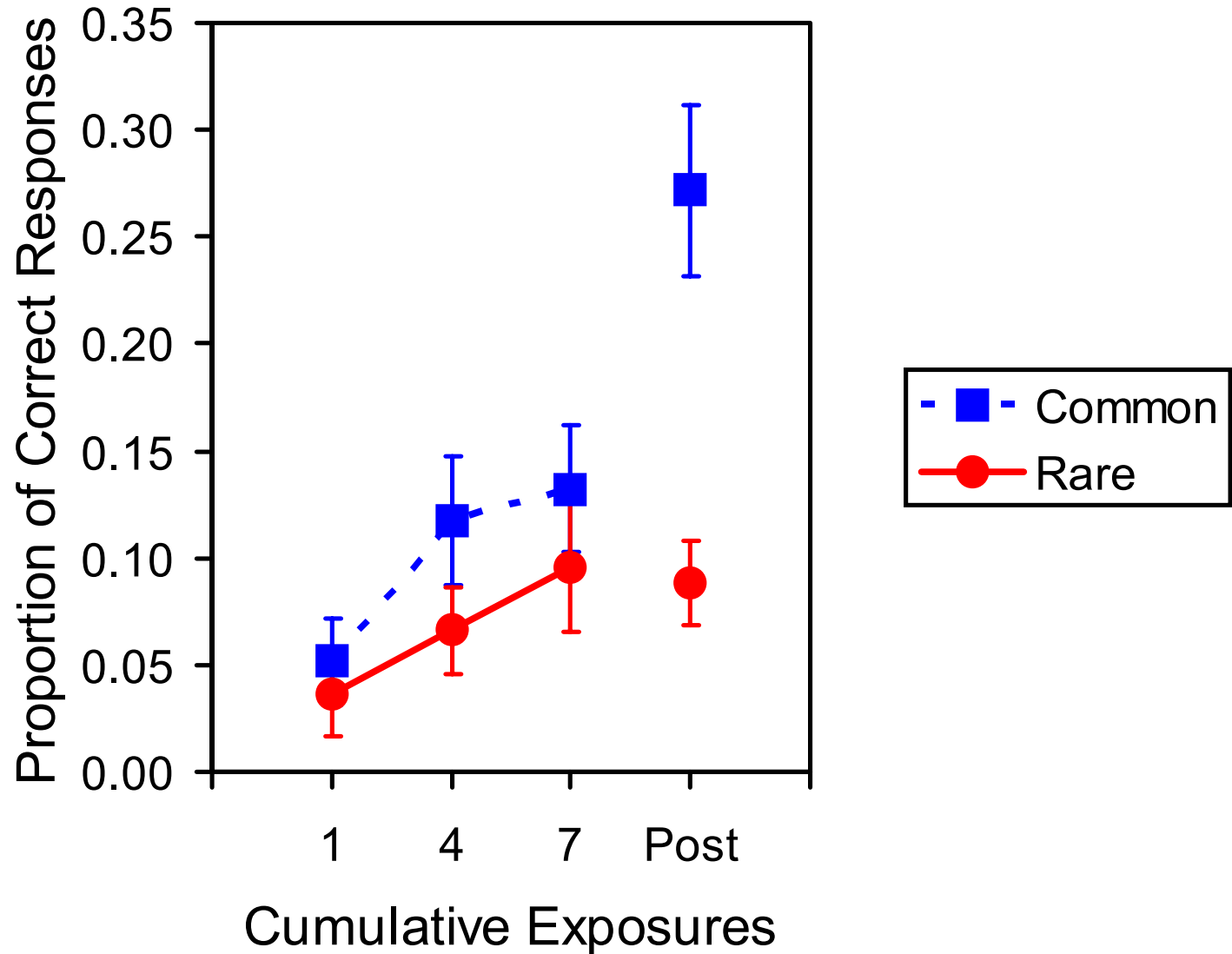
# Procedure



- Picture Naming



# Results: Object Naming



# Study 1: Summary

- Preschool children acquired common sound sequences more rapidly than rare
- Effect was consistent over 4-7 exposures and 1-week delay
  - Floor effect at 1 exposure

# Noun-Verb Difference

- Nouns predominate early vocabulary
- Nouns learned more rapidly than verbs
- Accounts
  - Conceptual difference
  - Morphology (English)
  - Sentence position (English)

# Study 2

## Storkel (In Preparation)





- Do preschool children learn actions associated with common sound sequences more rapidly than actions associated with rare sound sequences?



# Method

- Participants: 34 children
  - Age 3 - 6 yrs (M = 4; 3)
  - *GFTA-2* 21<sup>st</sup> - 97<sup>th</sup> percentile (M = 68)
  - *PPVT-3* 25<sup>th</sup> - 98<sup>th</sup> percentile (M = 75)
- Stimuli: 8 CVC nonwords
  - 4 common vs. 4 rare sound sequences

# Sample Stimuli

Form		Referent	
Common	Rare	Item 1	Item 2
kouf			
	jeip		

# Procedure

## Story Episode 1

1 exposure  
8 nonwords

## Test 1

## Story Episode 2

3 exposures  
8 nonwords

## Test 2

## Story Episode 3

3 exposures  
8 nonwords

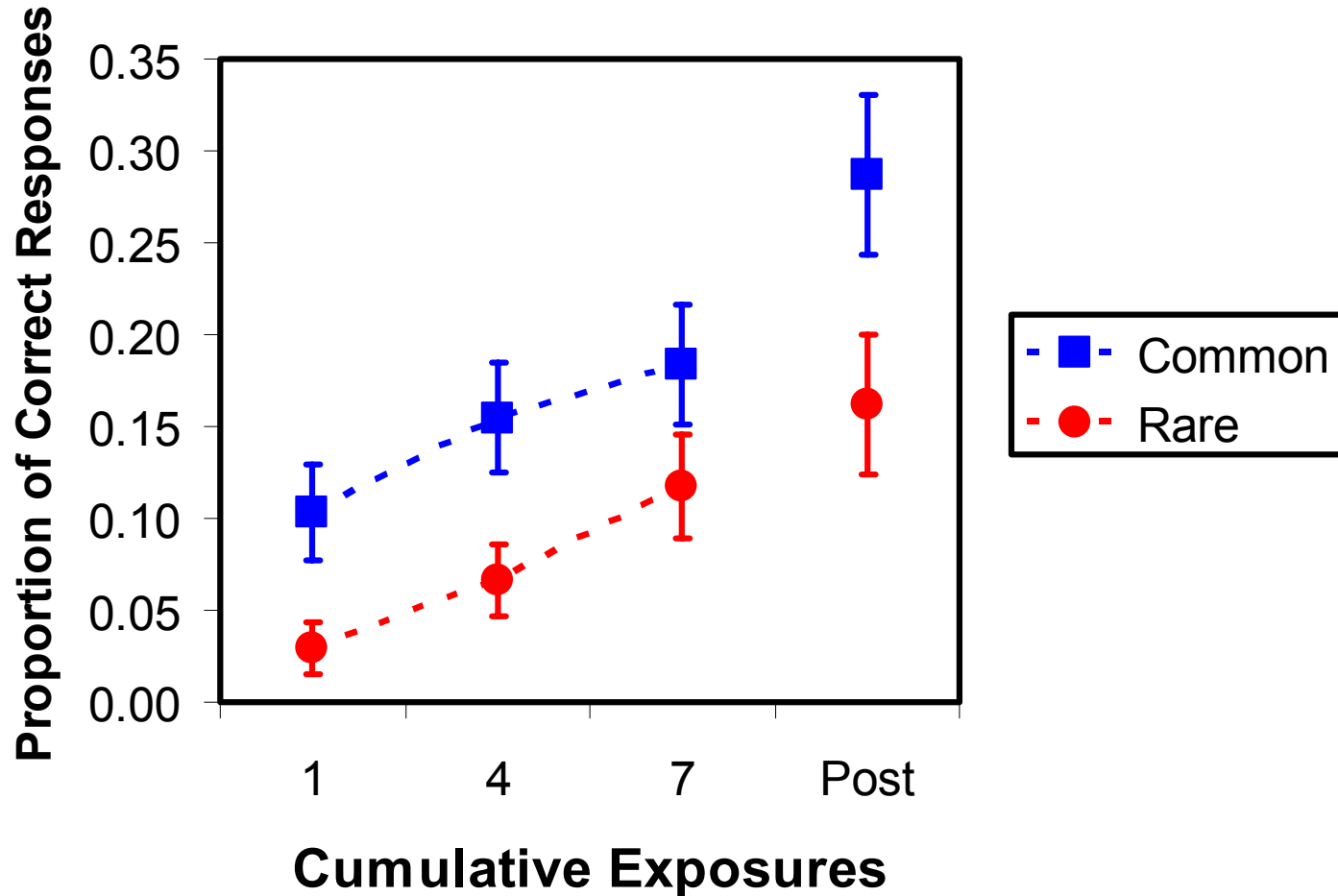
## Test 3

## Test 4

- Picture Naming



# Results: Verb Naming



# Study 2: Summary

- Common sound sequences learned more rapidly than rare
- Effect of phonotactic probability similar across words differing in grammatical class

# Conclusion

- Learn sound based regularities in the environment
- Regularities influence word learning
- Effect is similar across words differing in grammatical class

# Thank You

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