



# Predicting Word Learning by Preschool Children with Phonological Delays

Holly L. Storkel<sup>1,2</sup>, Jill R. Hoover<sup>2</sup>, & Junko Maekawa<sup>1</sup>

<sup>1</sup>Speech-Language-Hearing: Sciences and Disorders

<sup>2</sup>Child Language Doctoral Program

University of Kansas

## Prediction of Word Learning

(Gray, 2004, 2006)

- Vocabulary test scores
- Speech production test scores
- Nonword repetition (e.g., working memory)

## Children with Phonological Disorders (PD)

- Significant delay in acquisition of speech sounds with no obvious cause
- Other language skills (usually) within normal limits (Shriberg, Tomblin, & McSweeney, 1999)
- However, poorer performance on nonword repetition (Munson, Edwards, & Beckman, 2005)
- At risk for word learning deficits?

## Purpose

- Compare children with PD to typically developing children (TD) on
  - Word learning (immediate as well as retention)
  - Known vocabulary
  - Working memory (including nonword repetition)
- Determine predictors of word learning

## Participants

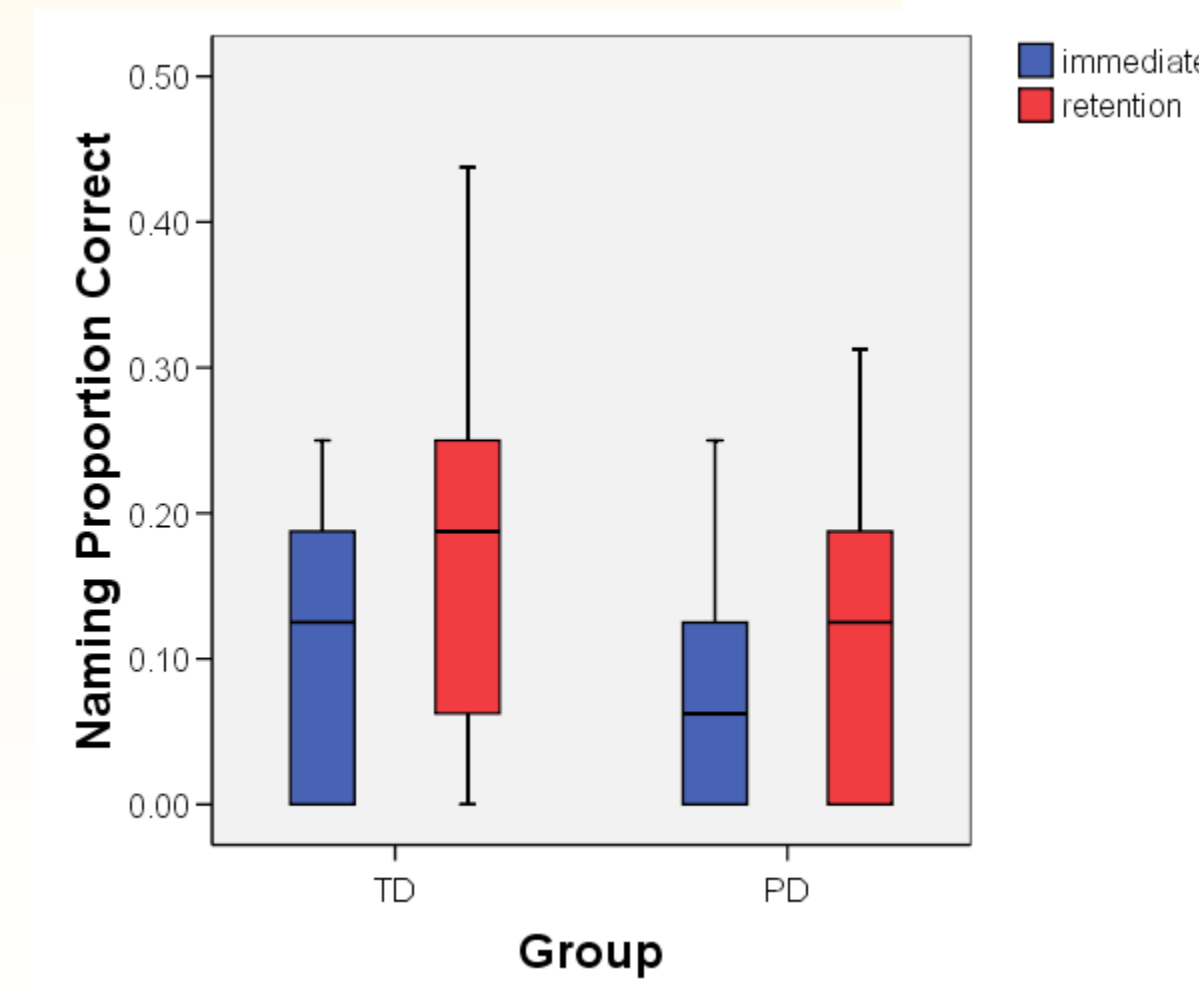
	Children with Phonological Disorders (PD)	Children with Typical Development (TD)
Number	20	20
Age	4;9 (0;10) 3;5 – 6;7	4;8 (0;9) 3;0 – 5;8
GFTA number of errors*	39 (6) 23 – 51	9 (10) 0 – 40
GFTA percentile rank*	6 (5) 1 – 16	64 (24) 27 – 98

Note: Difference in age was non-significant but trend for PD to be older so age used as a covariate in all analyses.

\*Significant difference between groups  $t(38) > 28$ ;  $p < 0.001$

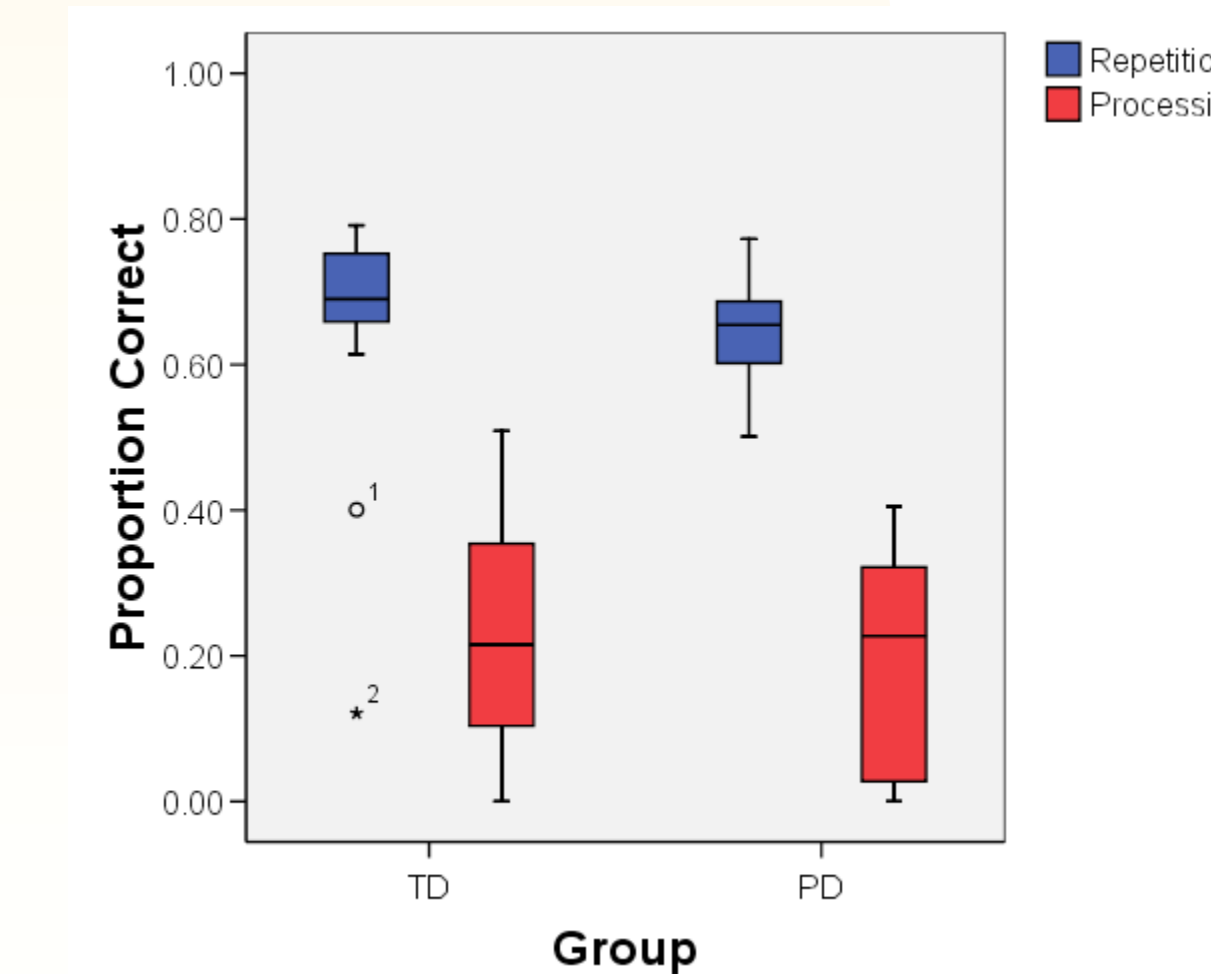
## Word Learning

- 16 CVC nonwords paired with novel objects
- Nonwords varied in phonotactic probability and neighborhood density
  - Collapsed across for this analysis to examine overall learning
- Exposure occurred in a game format
- Picture naming tested
  - Following 24 exposures (immediate learning)
  - After a 1-week delay without additional exposure (retention)
- ANCOVA: 2 Group (PD, TD) x 2 Time (immediate, retention) with Age as covariate
  - Significant effect of Group



## Working Memory

- Nonword Repetition: Repeat lists of CVC nonwords that increased in length from 1 to 4 nonwords
- Nonword Processing Task: Listen to a sentence containing a CVC nonword while viewing a picture containing a novel object
  - Verify whether the sentence matches the picture
  - Repeat the nonword(s)
    - Number of intervening sentences before repetition prompt varies from 1 to 4
- ANCOVA: 2 Group (PD, TD) x 2 Task (repetition, processing) with Age as covariate
  - No significant effect of group



## Summary and Conclusions

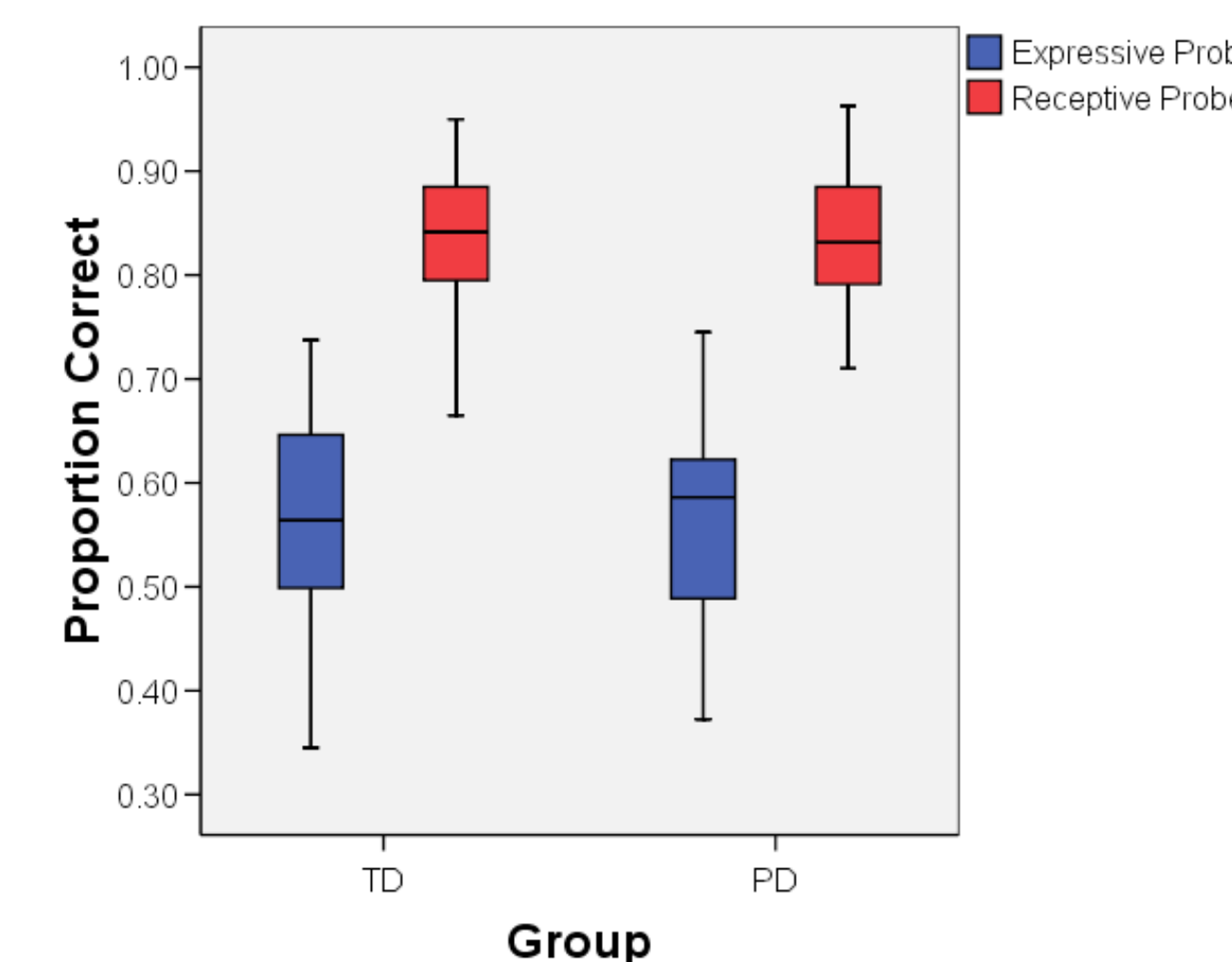
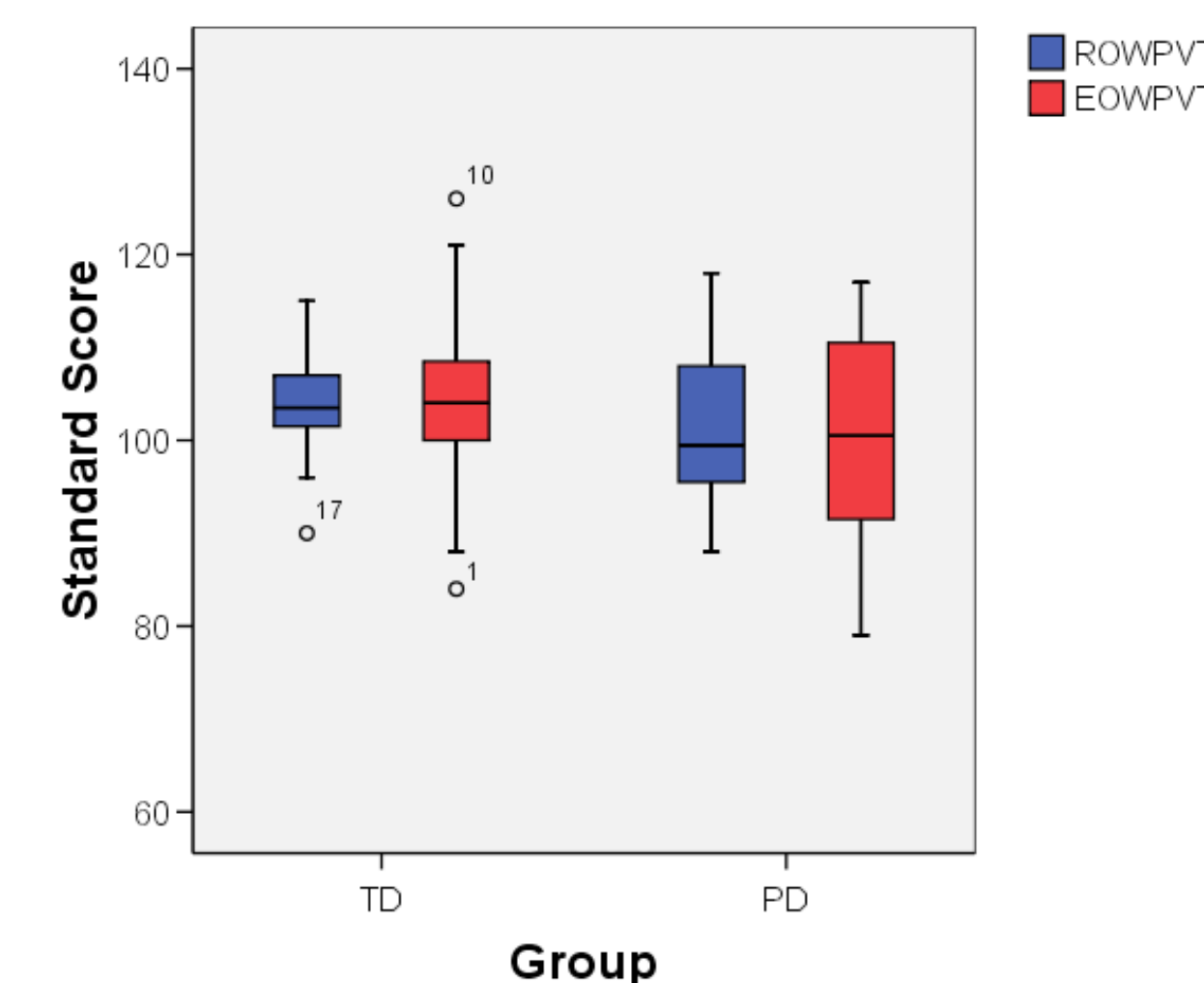
- Children with PD differ from children with TD in learning and retention of new words
  - Similar to other communication disorders (e.g., SLI)
- Children with PD were similar to children with TD in known vocabulary and working memory
  - Differs from other communication disorders (e.g., SLI)
- Immediate word learning was predicted by productive phonology
  - Productive phonology may influence immediate processing of novel words during short-term exposure
- Word learning retention was predicted by nonword repetition
  - Phonological working memory may influence quality of newly formed lexical representations impacting retention and recall of new words
- Intact phonological working memory may help children with PD compensate for deficits in initial word learning
  - Able to take advantage of additional exposures to improve the quality of lexical representations, yielding normal vocabulary

## References

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## Known Vocabulary

- Standardized Tests
  - Receptive One Word Picture Vocabulary Test (Brownell, 2000b)
  - Expressive One Word Picture Vocabulary Test (Brownell, 2000a)
- Vocabulary Probe
  - Receptive and expressive
  - Words varied in phonotactic probability and neighborhood density
    - Collapsed across for this analysis to examine overall learning
- 2 ANCOVAs: 2 Group (PD, TD) x 2 Test (receptive, expressive) with Age as covariate
  - No significant effect of group



## Predicting Word Learning

- 2 linear regression analyses: 1 for immediate word learning; 1 for retention
- Step 1: Age forced as predictor
- Step 2: GFTA raw score forced as predictor
- Step 3: ROWPVT & EOWPVT raw score added if significant
- Step 4: Vocabulary probe & working memory raw scores added if significant
- Immediate word learning
  - Only GFTA raw score approached significance ( $p = 0.065$ , partial  $r^2 = 0.10$ )
  - As GFTA errors decreased, immediate word learning proportion correct increased
- Word learning retention
  - Only nonword repetition significant ( $p = 0.015$ , partial  $r^2 = 0.17$ )
  - As nonword repetition accuracy increased, word learning retention proportion correct increased

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For more information please contact:  
[www.ku.edu/~wrldrng/](http://www.ku.edu/~wrldrng/)  
[hstorkel@ku.edu](mailto:hstorkel@ku.edu)

