



Predicting Word Learning by Preschool Children with Phonological Delays

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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

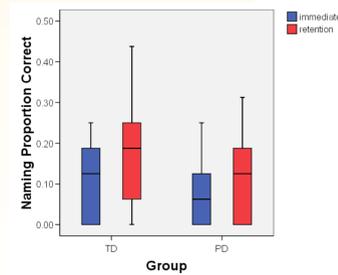
	Children with Phonological Disorders (PD)	Children with Typical Development (TD)
Number	20	20
Age	4;9 (0;10) 3;5 – 6;7	4;8 (0;9) 3;0 – 5;8
GFTA number of errors*	39 (6) 23 – 51	9 (10) 0 – 40
GFTA percentile rank*	6 (5) 1 – 16	64 (24) 27 – 98

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 $t(38) > 28$; $p < 0.001$

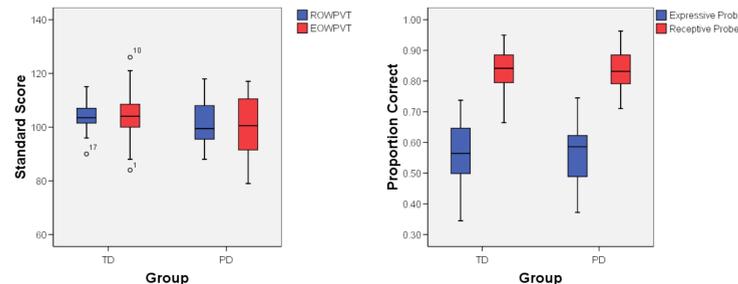
Word Learning

- 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



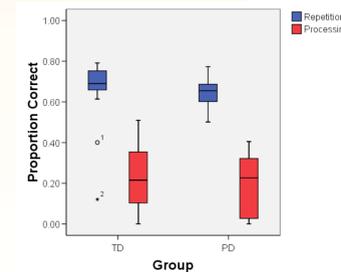
Known Vocabulary

- 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



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



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

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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