SACRED HEART UNIVERSITY

Comparing Nonword Repetition Measures in Bilingual Preschoolers

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Background

- Nonword repetition (NWR) tests have been shown (e.g., Dollaghan & Campbell, 1998; Estes at al., 2007; Dispaldro, Leonard, & Deevy, 2013) to be reliable methods for identifying language learning problems in children.
- However, NWR tests are biased toward the language in which they were created.
  - Nonwords in tests devised for English-speaking children resemble English words (a nonword such as *rubid* resembles the English word *ruby;* knowing *ruby* would help a child remember and repeat *rubid;* children who do not know *ruby* will have more trouble with *rubid).*
- This introduces a potential for bias when using NWR to identify language disorders in children learning English as a second language.

Purpose

- We aimed to compare two nonword repetition measures, each designed to avoid the bias toward English words.
  - NWRT (Ferre, dos Santos, & DeAlmeida, 201) identifies language difficulties in children learning a variety of first and second languages. It makes use of a range of consonants and syllable shapes.
  - Syllable Repetition Test (SRT; Shriberg, 2009) measure minimizes articulatory difficulty by using only a small number of consonants common to virtually all languages (/b/, /p/, /d/, /t/, /m/, /n/, /a/).
  - We compare performance on these two measures in monolingual and bilingual preschool children in an inner city public preschool program.

Methods: Participants

- 50 4-year old children enrolled in an inner city preschool program for low income families participated.
  - 60% from monolingual English homes
  - 20% from Spanish speaking homes; 20% from Portuguese
- Consent forms distributed in English, Spanish, and Portuguese
- All the children have been in school readiness since their third birthday; the school readiness program is conducted in English; all students participate in school activities in English.
- The children from Spanish and Portuguese speaking homes, are considered bilingual.

Methods: Procedures

- Each child was administered NWRT and SRT by trained SHU graduate students fluent in English, Spanish and/or Portuguese
  - Instructions were given in child's native language.
  - Order of presentation of the two tests was randomized.
- Responses were audiorecorded and scored online by trained raters
- Intraclass correlation coefficients (I*CC*) were computed as a metric of reliability
  - Very Good (NWRT, *ICC* = .89) to Excellent (SRT, *ICC* = .95) consistency was obtained for both tasks

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Methods: Characterization

The following measures were given in English to assess English language and nonverbal skills:

- The *Primary Test of Nonverbal Intelligence* (P-TONI; Ehrler & McGhee, 2008)
- The *Peabody Picture Vocabulary Te*st-4th Ed. (PPVT-4;Dunn & Dunn, 2007)
- The Articulation Screener from the *Preschool Language Scale-5* (PLS-5, Artic; Zimmerman, I. Steiner, V. & BS, Pond, R., 2011)
- *Student Oral Language Observation Matrix* (SOLOM; Robbins, Green, & Waltzman, 2004)
  - Teachers rated each child on the SOLOM, which rates a non–English-speaking child's proficiency in a second language on a 5-point scale across 5 communication domains that reflect both comprehension and expression.
- See Table 1.

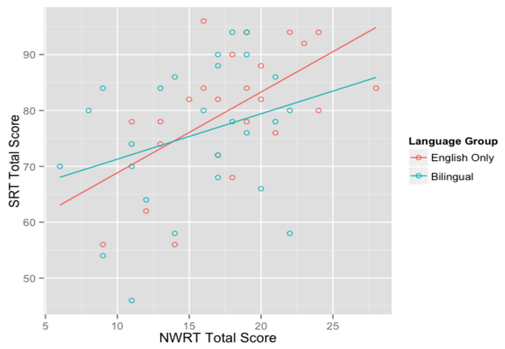
Results

Table 1. Participant Characterization by Language Group

	English only (*n* = 24)	Bilingual (*n* = 26)
P-TONI (*SD*)	106.12 (7.80)	109.00 (11.28)
PPVT-4 (*SD*)	110.42 (11.14)	104.04 (11.96)
PLS-5, Artic. (*SD*)	20.46 (1.82)	18.58 (3.00
SOLOM (*SD*)	23.17 (2.71)	21.81 (3.54)

Figure 1. Scores from Experimental Tasks

Figure 2. Relationship between NWRT and SRT Performance



Results

- No significant differences on experimental tasks between language groups (See Fig. 1 and 2; NWRT, p = .07*;* SRT, p = .19)
- Performance on NWRT and SRT were significantly related for the English Only group but not for the Bilingual group *(*See Table 2).
- Linear regression revealed that language group did NOT predict performance on either NWRT, b = -2.41, $t(48)$ = *-1.85,* p = .07, or SRT, b = -4.47, $t(48)$ = *-1.33,* p = .20.
- Articulation score predicted a significant portion of variance on NWRT (R^2 = *.25*, F(1,48) = 15.6 p < .001) but not SRT (b = 1.25, $t(48)$ = *-1.97,* p = .06).

Table 2. Relationship between Task Performance and Nonverbal IQ by Language Group

	1	2	3
English Only			
SRT Total Score			
NWRT Total Score	0.58***		
P-TONI	0.22	0.13	
Bilingual			
SRT Total Score			
NWRT Total Score	0.30		
P-TONI	0.15	0.13	

p < .001

Conclusions

These low income 4 year olds, after one year of full-time preschool in English, perform within the average range on nonverbal and verbal (English) measures, even though half the group comes from bilingual homes.

➡ High quality English-language instruction is effective in minimizing language delays in both monolingual and bilingual low-income preschoolers.

There was no significant difference between monolingual and bilingual groups on either measure of nonword repetition, and language group did not predict scores on the NWRT or SRT.

➡ Both the NWRT and the SRT appear to provide assessment of nonword repetition that is equally unbiased for bilingual preschoolers.

Articulation scores are related to NWRT performance, but not to SRT performance.

➡ The greater number of consonants required by NWRT results in stronger relations to articulation performance.

Performance on BOTH NWRT and SRT was independent of verbal IQ.

➡ Both nonword repetition measures provide an index of verbal ability that is relatively unaffected by nonverbal cognitive level.

Both measures have potential for identifying both monolingual and bilingual preschoolers at risk for the language and literacy delays known to be associated with low performance on nonword repetition tasks.

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