RAN READING RELATIONSHIP IN SPANISH

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ABSTRACT

Purpose: RAN/ RAS (Rapid Automatized Naming and Rapid Alternating Stimulus) measures the ability to name as quickly as possible, visually presented familiar symbols such as objects, colours, letters and digits. These tasks indicate how fast the brain can integrate visual and language processes. This project aimed to adapt the traditional Ran Ras (Wolf and Denkla 2005) to Spanish and investigate how it correlates to other known indicators of reading fluency and comprehension. Methods: The RAN/RAS was adapted to Spanish by changing some of the tokens that caused confusion in a pre-pilot study. Symbols were presented in a linear sequence, analogous to how we read words. All symbols represented bi-syllabic words. RAN/RAS, phonological awareness, letter naming, word and pseudoword reading efficiency and fluency (LEE Lectura y Escritura en Español, Defior, 2006), were individually assessed in 134, 5/8-year old kids. Results: in 5 year olds RAN/RAS measures correlated to letter naming and phonological awareness; in six year olds to word and pseudoword fluency and accuracy and phonemic segmentation. In seven year olds to word and pseudoword fluency and efficiency, but not to measures of reading comprehension. In 8 year olds to reading fluency and accuracy and reading comprehension. Conclusions: the development of normative data for a RAN/RAS test in Spanish may provide a useful tool for the early detection of children who may require early intervention to successfully develop their reading and writing skills.

Keywords: RAN/RAS, spanish, reading, dyslexia.

EXTENDED SUMMARY

RAN (rapid automatized naming) refers to the ability of naming, as fast as possible, a set of familiar visual stimuli, such as letters, numbers, colors and objects presented serially on a page (M. B. Wolf, P., 1999). Research in many languages has shown that naming speed is related to reading development, even after other variables have been controlled for. The other important cognitive determinants of competent reading include phonological awareness, phonetic decoding, orthographic processing, morphologic processing and vocabulary (Kirby, Desrochers, Roth, & Lai, 2008).

Why naming speed is related to reading is still a question of debate. Both naming and reading require the eyes to move sequentially across the page, the stimulus be fixed, encoded and its mental representation accessed and that the processes involved in naming the stimulus be activated. While the first stimulus is fully articulated, the eyes must move on to the next. Wolf and Bowers (1999) defined naming speed as a microcosm of reading.

Naming speed has been shown to be a strong longitudinal predictor of reading ability in both consistent and inconsistent alphabetic orthographies. However, there is evidence that it would be a better predictor for transparent languages, such as Spanish. Accuracy is generally higher in consistent orthographies; therefore word decoding plays a weaker role in reading speed compared to inconsistent orthographies (Georgiou, Parrila, & Papadopoulos, 2008). It seems that phonological awareness is essential in the early stages of reading acquisition, but that as kids master the ability to decode words precisely, a move occurs where the relationship between RAN and reading becomes stronger (Vaessen et al., 2010).

The double deficit hypothesis, developed by Wolf and Bowers (M. B. Wolf, P., 1999) proposes that a deficit in either phonologic awareness or naming speed can lead to reading difficulties. Moreover, these deficits can co-exist and these children present the greatest difficulties in reading. Therefore the identification of kids that fall into any of the categories that present either one or both deficits is key to the implementation of remedial work early on.

This project aimed to adapt the traditional RAN/RAS (M. D. Wolf, M., 2005) to Spanish, in Argentina, and investigate how it correlates to other known indicators of reading fluency and comprehension.

METHODS

The RAN/RAS was adapted to Spanish by changing some of the tokens that caused confusion in a pre-pilot study. Symbols were presented in a linear sequence, analogous to how we read words. All symbols were represented bi-syllabic words.

Participants: a sample of 133 Argentine children between the ages of 5 and 8 (mean age: 85.67 months, SD = 14.18) attending 2 private schools in the city of Buenos Aires. All children were native speakers of Spanish and came from middle socioeconomic backgrounds. Children were assessed individually once or twice during school hours. In kindergarten the sample consisted of 36 children (17 girls, 19 boys); Grade 1, 28 children (17 girls, 11 boys); Grade 2, 31 children (18 girls, 13 boys) and Grade 3, 38 children (29 girls, 9 boys).

Measures: in kindergarten children were assessed in: Raven Progressive Matrices, phonemic segmentation, letter reading, phonological awareness (syllable tapping, initial syllable identification, final syllable identification, initial phoneme isolation), all from the LEE test.

In Grade 1: Raven Progressive Matrices, phonemic segmentation, letter reading, Reading fluency (word reading, word reading fluency, non-word reading fluency), all from the LEE test.

In Grades 2 and 3: Raven Progressive Matrices, reading fluency (word reading, word reading fluency and non-word reading fluency), reading comprehension (3 texts were used to test: reading speed, literal questions, inferential questions, text structure, total comprehension score, monitoring (back to text), total comprehension time).

All kids were testes for RAN/RAS: Objects, Letters, Numbers, Colors, Letters/Numbers, Letters/Numbers/Colors.

RESULTS

The measures for RAN/RAS showed a statistically significant decrease with age as determined by a One Way Analysis of Variance ($p<0.001$). The assumption of normality for RAN and RAN/RAS scores was satisfied for all age groups, as assessed by the Kolgomorov-Smirnov's test ($p>0.05$). We carried out Pearson Correlation studies to determine whether the RAN/RAS measures correlated with the other indicators of reading. In 5 year olds RAN/RAS measures correlated to

letter naming and phonological awareness; in six year olds to word and pseudoword fluency and accuracy and phonemic segmentation. In seven year olds to word and pseudoword fluency and efficiency, but not to measures of reading comprehension. In 8 year olds to reading fluency and accuracy and reading comprehension. Colors, on its own, did not correlate with any of the measures of reading.

CONCLUSIONS

The development of normative data for a RAN/RAS test in Spanish provides a useful tool for the early detection of children who may require early intervention to successfully develop their reading and writing skills. Given that Spanish is a transparent language, speed is a useful measure to detect children at risk in the early grades.

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