

INHERENT FEATURES OF PSEUDOWORDS AND THEIR IMPORTANCE IN EXAMINING PHONOLOGICAL PROCESSING

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BACKGROUND

Pseudowords (PW) = legal non-words; they satisfy phonological and orthographic rules of a language, but not semantic

- First recognized as an indication of language knowledge of preschool children by J. Berko (1958; see also Wagner et al., 1993)
- Important in explaining the features of phonological processing - confirmed in the clinical context, as well (Bree et al., 2007)

Techniques for generating pseudowords (König et al., 2020)

- 1) **Stimulus manipulation:** phonological manipulation of *real* words
- 2) **Using high-frequency bigram combinations:** combining frequent bigrams in language (WordGen; Duyck et al., 2004)
- 3) **Combining sub-syllabic elements:** reorganizing the existing elements of syllabic structure to form new combinations (Wuggy; Keuleers & Brysbaert, 2010)

INHERENT FEATURES OF PSEUDOWORDS

Pseudowords repetition & pseudowords reading = prototype measures of phonological processing; core difficulty for persons with dyslexia; should be a part of diagnostic procedures

- **Inherent features of PW** = related to processing costs, may influence one's performance

This study focuses on:

- 1) **Length:** longer PW = more demanding to retain in STM (Baddeley et al., 1998)
- 2) **Segmental complexity:** representation of consonant clusters in PW: more complex combinations = more demanding
- 3) **Wordlikeness:** lexical distance of a PW from real word (objective/subjective): more distant = more difficult to pronounce and process (Rispen et al., 2015) (opposite effects for lexical decision task!)

Purpose: to examine phonological and lexical features of PW in Croatian; first step of PW generation for further use in the assessment of children with dyslexia (CwD)

AIM: to examine the correlation between the features of PW and success in PW repetition/reading in children with typical development of reading skills (beginning and automatized readers; TD - BR and TD - AR) and CwD

Expectation: significant moderate to high correlation between all three features and success on PW repetition and reading

METHOD

Participants: 1) TD - BR: $N = 68$ (Female = 35); $Age = 8,21$, $SD = 0,34$; $Grade = 2^{nd}$; 2) TD - AR: $N = 161$ (Female = 67); $Age = 9,67$, $SD = 0,65$; $Grade = 3^{rd}-4^{th}$; 3) CwD: $N = 18$ (Female = 7); $Age = 8,78$, $SD = 0,57$; $Grade = 3^{rd}$

Materials: two lists created by combining sub-syllabic elements (repeating & reading): 17 PW in each list

- Length of 2-5 syllables, represented in the *School Corpus of Written Language* (Riddys; Kuvač Kraljević & Lenček, 2020) with occurrence > 10,000; subjective wordlikeness measures

Procedure: individual testing by the SLP in the child's school

Data analysis: each list re-evaluated by two SPLs + data processed in *IBM SPSS Statistics 24*

RESULTS

PW repetition:

- 1) TD - BR: $M = 11,59$, $SD = 1,31$
- 2) TD - AR: $M_{3rd} = 15,49$, $SD_{3rd} = 1,26$; $M_{4th} = 15,91$, $SD_{4th} = 1,28$
- 3) CwD: $M = 14$, $SD = 1,27$

PW reading:

- 1) TD - BR: $M = 11,5$; $SD = 3,49$
- 2) TD - AR: $M_{3rd} = 12,83$, $SD_{3rd} = 3,78$; $M_{4th} = 13,92$, $SD_{4th} = 2,96$
- 3) CwD: $M = 4,47$, $SD = 2,5$

inherent features of PW	succes in PW repetition		
	TD - BR	TD - AR	CwD
length (in phonemes)	$r = -0,54^*$	$r = -0,58^*$	$r = -0,64^{**}$
segmental complexity	$r = -0,5^*$	$r = -0,38$	$r = -0,65^*$
wordlikeness	$r = 0,51^*$	$r = 0,55^*$	$r = 0,58$

Table 1: Correlations between inherent features of PW and success in PW repetition

inherent features of PW	success in PW reading		
	TD - BR	TD - AR	CwD
length (in graphemes)	$r = -0,91^{**}$	$r = -0,91^{**}$	$r = -0,81^{**}$
segmental complexity	$r = -0,6^*$	$r = -0,72^{**}$	$r = -0,73^{**}$
wordlikeness	$r = 0,66^{**}$	$r = 0,7^{**}$	$r = 0,44$

Table 2: Correlations between inherent features of PW and success in PW reading

M = mean, SD = standard deviation, $** p < 0,01$, $* p < 0,05$

DISCUSSION

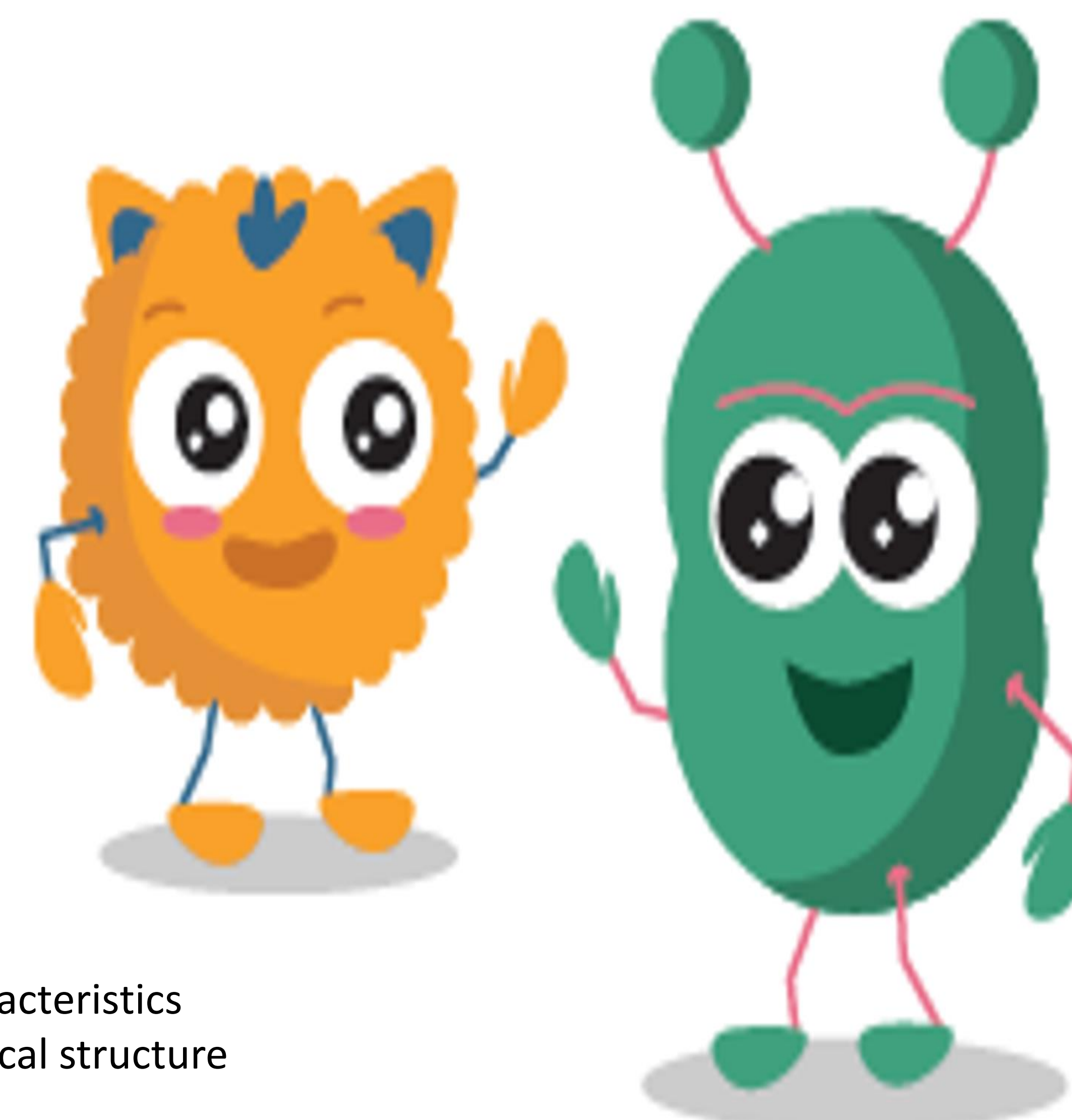
- For all participants: **repeating PW easier than reading**
- **Length:** phonological feature **connected with success in repetition and reading** regardless of reading abilities and automatization; longer PW = more demanding to store and recall from STM, as in previous studies (Baddeley et al., 1998)
- **Segmental complexity:** connected with success in repetition and reading, except in repetition of TD - AR
- **As the automatization of phonological skills and reading develops, this connections weakens**
- **Wordlikeness:** eliminating *meaning* increases reliance on pure phonological knowledge
- Only in CwD group it does not correlate with success in repetition nor reading = difficult to rely on phonological and lexical knowledge simultaneously

Expectation (partially) confirmed!

- Future studies will include a larger sample of participants & combinations of inherent features with more variations

CONCLUSION

- Pseudowords = important indicators of phonological processing & provide additional insights into its characteristics
- Very important to control their inherent linguistic features with respect to the language and its phonological structure



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