

Production of consonant clusters of 4–8-year-old Lithuanian children

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Introduction

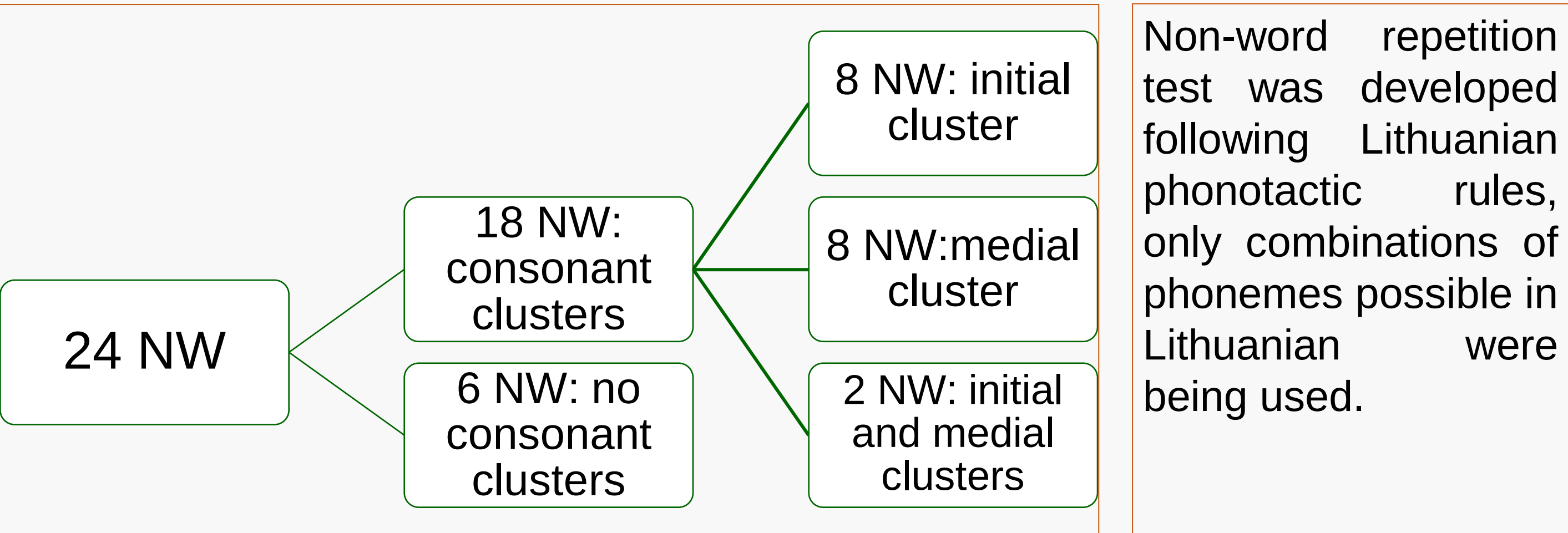
In the present research, the analysis of production of consonant clusters was based on the ideas of the Naturalness Theory (Dressler 1993, 2005). Naturalness in a language refers to a form which is cognitively simple, easy to pronounce, and to perceive; therefore, it is used frequently. Naturally, in language acquisition, children make more errors in using marked forms, i.e. the elements which are not very natural are frequently substituted by more natural and more usual elements and/or the elements that are easier to pronounce (Dziubalska-Kołaczyk 2014; Marecka, Dziubalska-Kołaczyk 2014).

Non-word items

Two-syllable non-words	Three-syllable non-words	Four-syllable non-words
k e m u CV.CV	g e l o f a CV.CV.CV	s u l e r i t e: CV.CV.CV.CV
d o j æ CV.CV	ʃ i r u t a CV.CV.CV	ž a d e v i n a CV.CV.CV.CV
s k i m o CCV.CV	ʃ k u l i n e: CCV.CV.CV	s n a l i d i n a CCV.CV.CV.CV
ʃ v e l a CCV.CV	p l e m u t a CCV.CV.CV	s p i r a t u f a CCV.CV.CV.CV
g a : p r e: CV.CCV	m a : s p u l e: CV.CCV.CV	n i s p a r i m a CV.CCV.CV.CV
g i t v a CV.CCV	l a s m u v i CV.CCV.CV	m a g v u n o l e: CV.CCV.CV.CV
s m i n t o CCVC.CV	s p a : d e k i CCV.CV.CV	s t a l i g o s a CCV.CV.CV.CV
k l e s t a CCV.CCV	p a : s v a p i CV.CCV.CV	g o s a k l u : n i CV.CV.CCV.CV

(syllables are separated by dots)

Structure of NWR test



Procedure

The children were tested individually: they were asked to listen to non-words one at a time and to repeat each item immediately following its presentation. The non-words were displayed in a fixed order in a PowerPoint presentation.

Data (N=480)

Age group	N	Gender (F / M)
4;00-4;11	96	59 / 37
5;00-5;11	95	47 / 48
6;00-6;11	95	49 / 46
7;00-7;11	97	48 / 49
8;00-8;11	97	50 / 47

Acknowledgments

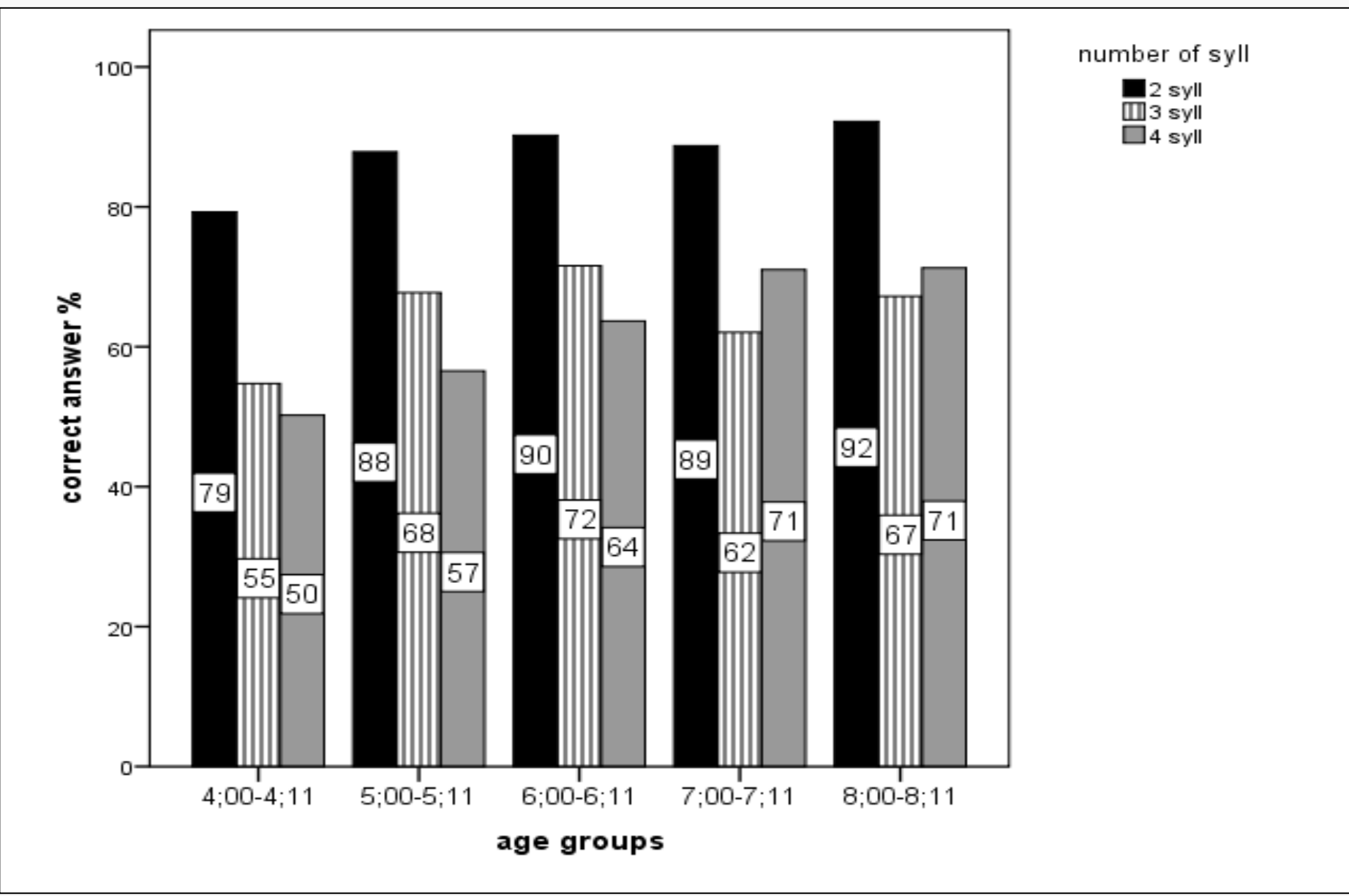
The study was based on a methodology developed in the framework of the COST Action IS0804 *Language Impairment in a Multilingual Society: Linguistic Patterns and the Road to Assessment*.

References

Dressler, W. U. 1993: What is Natural in Natural Morphology (NM)? Prague Linguistic Circle Papers. Prague: Charles University, 135–145.
Dressler W. U. 2005: Word-formation in Natural Morphology. Handbook of Word-Formation. Springer Netherlands, 267—284.
Dziubalska-Kołaczyk K. 2014: Explaining Phonotactics Using NAD. Language Sciences, 6–12.
Marecka M., Dziubalska-Kołaczyk K. 2014: Evaluating Models of Phonotactic Constraints on the Basis of sC Cluster Acquisition Data. Language Science, 37–47.
Santos F. H., Bueno O. F. A., Gathercole S. E. 2006: Errors in Nonword Repetition: Bridging Short- and long-term Memory. Brazilian Journal of Medical and Biological Research, 39, 371–385.

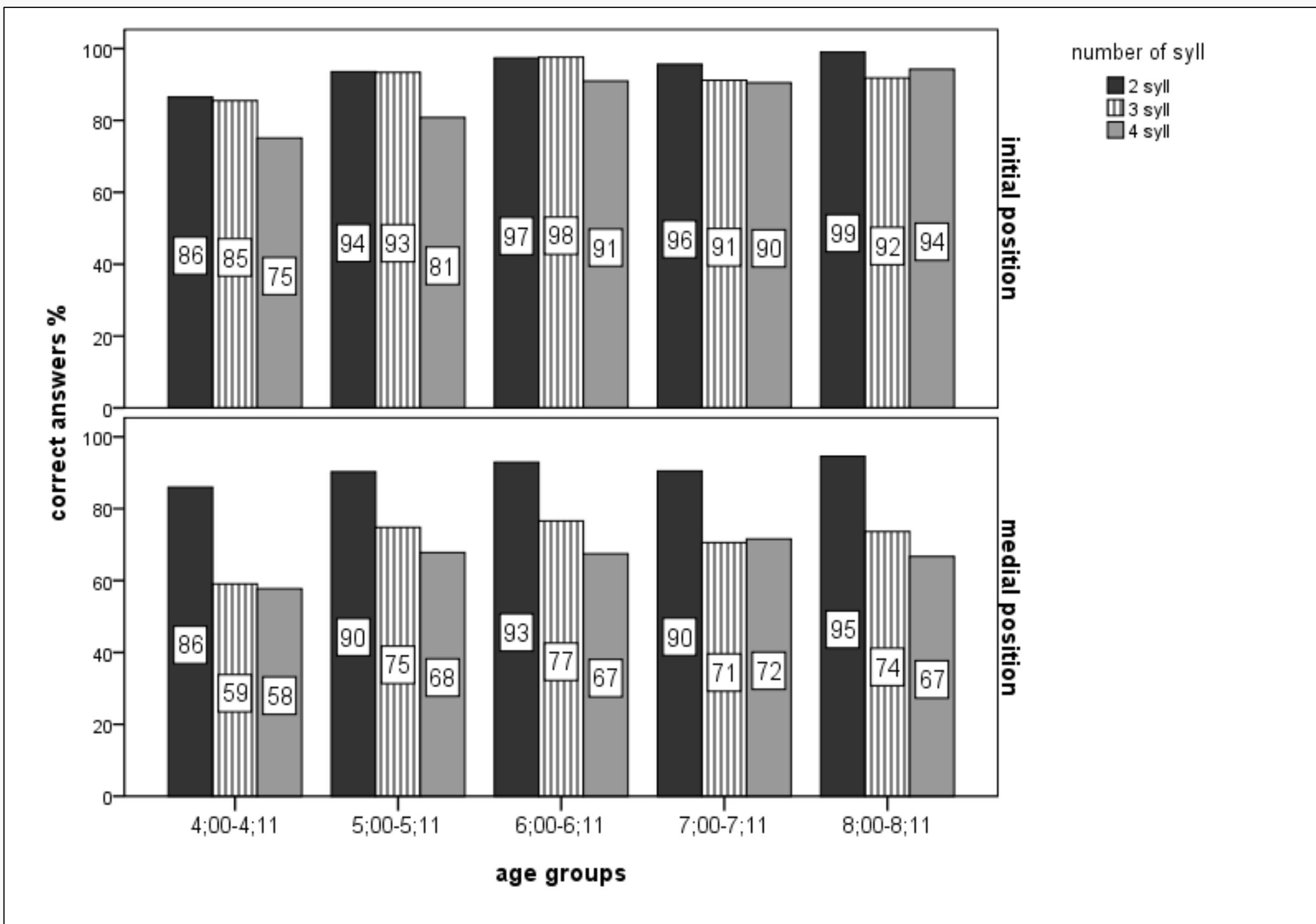
Results

Repetition results of non-words with a consonant cluster



- The longer the word is, the worse it is repeated ($r = -0.407$).
- Two-syllable words were repeated with the accuracy of 79–92%; three- and four-syllable words were repeated in the interval of 50–72%.
- The repetition results of two- and three-syllable words differ statistically significantly ($p = 0.000$); no significant difference between the repetition results of three- and four-syllable words ($p = 0.365$).
- School-age children (7;00–8;11) repeated four-syllable words more accurately than three-syllable words.

Position of the cluster: initial vs medial



The clusters in the *initial* position were repeated significantly more accurately than the clusters in the *medial* position ($p = 0.000$): 91% and 76%, respectively.

Qualitative analysis

Children apply universal pronunciation simplification strategies to pronounce consonant clusters:

- Substitution: *škimo* (= *skimo*), *blemuta* (= *plemuta*), *mastule*, *maskulė* (= *maspule*), *niskarima* (= *nisparima*).
- Omission: *kimo* (= *skimo*), *gita* (= *gitva*), *šela* (= *švela*), *lemuta* (= *plemuta*), *gosakuni* (= *gosakluni*), *magunolė* (= *magvunolė*).
- Addition: *droja* (= *doja*), *kemlo* (= *kemu*), *švelna* (= *švela*), *lasmulvi* (= *lasmuvi*), *sumleritė* (= *suleritė*), *žadelvina* (= *žadevina*), *mangvunolė* (= *magvunolė*).
- Assimilation: *gabrė* (= *gaprė*), *gosagluni* (= *gosakluni*), *slalidina* (= *snalidina*), *nismarima* (= *nisparima*), *magvunolė* (= *magvunolė*).
- Metathesis: *magvunolė*, *magvulonė*, *maglunovė* (= *magvunolė*).
- Sound migration to another syllable: *gvita* (= *gitva*), *glosakuni* (= *gosakluni*).

Conclusions

- It is difficult for children to repeat longer than two-syllable words with a consonant cluster.
- The position of the cluster in a word is important: the clusters in the *initial* position are repeated significantly more accurately than the clusters in the *medial* position.
- In order to pronounce the words with a more complicated structure, children look for ways of facilitating their pronunciation: they omit the consonants with more complicated pronunciation or substitute them by other consonants, which are easier to pronounce. Inaccurate pronunciation of sounds or their substitution by other sounds are a natural development of children's language (Santos et al. 2006).
- The research has shown that when children substituted one of the consonant cluster elements, the cluster was changed into the one which is more typical of Lithuanian words or easier to pronounce.

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