

# Perceptual learning effects on word recognition in Latvian children with reading difficulties

E.Kassaliete, E.Megne, I.Lacis, S.Fomins

Department of Optometry and Vision Science, University of Latvia

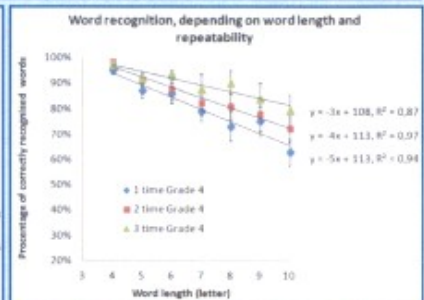
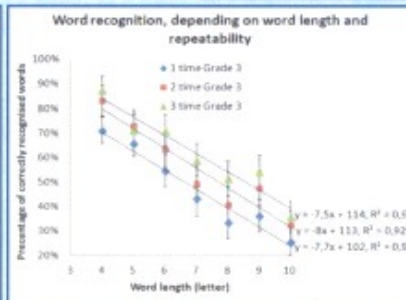
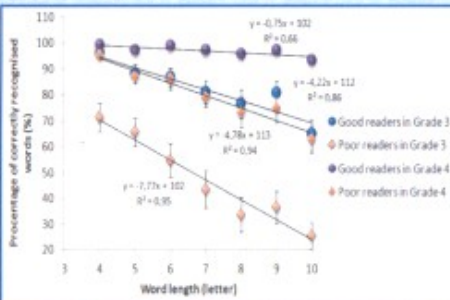
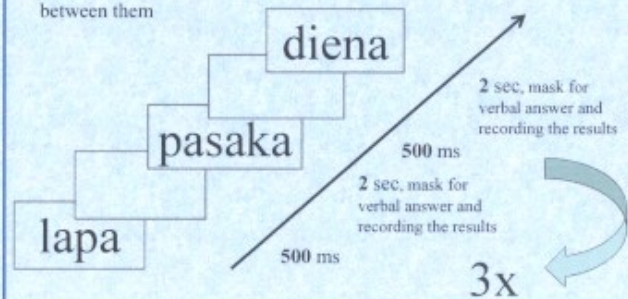
[evita.kassaliete@lu.lv](mailto:evita.kassaliete@lu.lv)

**Introduction:** In Latvia approx. 15-20% of school-aged children are with reading difficulties [1]. Latvian is a transparent language. There are many neural processes which participate in text decoding during reading [2]. The aim of the study was to determine perceptual learning effects on word recognition in poor readers.

**Method: Part I - Reading Test** Sixty-eight children from Grade 3 (n=35) and Grade 4 (n=33) took part in the study. Poor readers in Grade 3 (n=17) and in Grade 4 (n=14) were selected using *One minute reading test and Latvian criteria for reading speed*. They reads passage. The reading speed was calculated with deducting misread words. Reading accuracy was not less than 86% in both age groups. The mean value was 97%. Latvian criteria for reading speed in Grade 3 (8 years old) 60-80 wpm, in Grade 4 (9 years old) 80-90wpm.

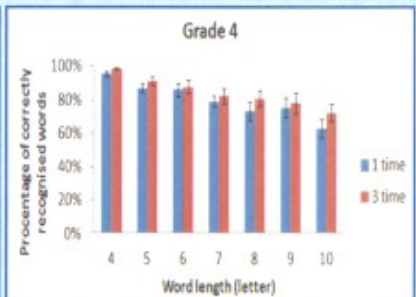
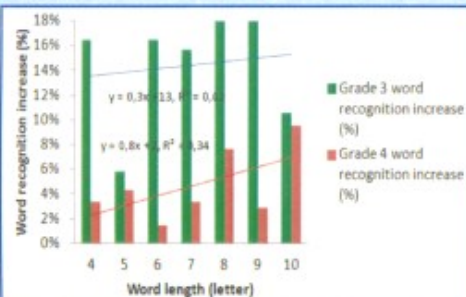
**Part II - Word recognition Test** The same stimulus set was shown three times with different time intervals, Fig.1. The stimulus set for word recognition contained 150 words. The length of the words varied from four to ten letters. Each word was shown on a computer screen for 500 ms. Answers were expected verbally (2s). Correct and incorrect answers were recorded. Each word length was shown 15 times. Letter size corresponded to 6 cycles/ degree.

Fig.1 Schematic slide show with variable word length and mask between them



**Results: Part I - Reading test.** Less than Latvian criteria for reading speed in Grade 3 were to 17 children, when mean value was 62±3wpm, but in Grade 4 to 14 children, when mean value was 91±6 wpm. Using a standard distribution of the fifth percentile analysis, 8.6% of Grade 3 and 3.3% of Grade 4 were observed reading difficulties.

**Part II Word recognition Test and perceptual learning.** Data of correctly named words for poor readers in Grade 3 and Grade 4 were significantly different (p<0,05) for all word lengths. Differences between slopes at first time and third time in both groups are not significant, in Grade 3 (p=0,86), in Grade 4 (p=0,064). Deviation significantly differ from zero (p<0,05). Word recognition increase by 14,44%±0,02 in Grade 3 and 4,63%±0,01 in Grade 4 after third time revision. Word recognition increase between groups are significant (p<0,05), but differences between slopes by increase at groups are not significant (p=0,66), and deviation from zero are not significant in Grade 3 (p=0,76), in grade 4 (p=0,17).



**Conclusions:** Data of correctly recognized words for poor readers in Grade 3 and Grade 4 were significantly different (p<0.05) for all word lengths. The study confirms that children in Grade 3 in perceptual learning process continues to use letter-by letter reading pattern, when older children in perceptual learning process starting to use parallel letters activation that did not prove statistically. They have bigger visual attention span. Word recognition and processing speed improves with age, perceptual learning and memory. Word recognition increase was better in Grade 3. This means that with this method, we training processing speed or memory more than the expanding of visual attention span.

References: [1] Štrnbe, Tõbele, Anna Kõpõle, "Izskaidrojam, kāpõr daudzi bērni ir ar lasõšanas grõtbõti", *Profilaktiskõs darbu grõmatõs grõmatõs*, pp.146-150, (2005). [2] Ventura J. G., Martinez, Peter E. De Jong, "The effect of word length on lexical decision in dyslexic and normal reading children", *Brain and Language*, 98, p.140-149, (2000).