

Comparison of faster and slower responders to early intervention in reading: Are there specific neurocognitive predictors?

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The Goal

The study focused on the rehabilitation of children who were at risk for dyslexia. In the study the neurocognitive profiles of faster and slower responders to the early reading intervention were compared.

Study Design

The literacy skills of 370 Finnish children were followed from school entry until the end of the second school year. The screening procedure was carried out during the first two weeks of the first grade. The school entrants were tested using tasks on concepts, phonological awareness, letter knowledge, word recognition and spelling. The children whose performance was low (4/6 tasks ≤ -1 sd or 3/6 tasks ≤ -2 sd) in the school entrance screening were selected to the at-risk group (n = 72).

The Response-To-Intervention (RTI) framework was applied while providing interventions for the at-risk children. During the first fall term they received regular special education, and additionally half of them played the phonics-based GraphoGame (Figure 1).

The at-risk children whose performance in the literacy tasks was low in the follow-up at the beginning of the spring term, were chosen for individualized interventions (n = 20). The poorest readers (n = 10) were assigned into individualized rehabilitation during the spring term of the first school year, while the others (n = 10) participated in the individualized phase during the spring term of the second school year.

At the end of the second school year the children with lowest performance in reading and spelling tests (n = 4) were assigned as treatment resisters.

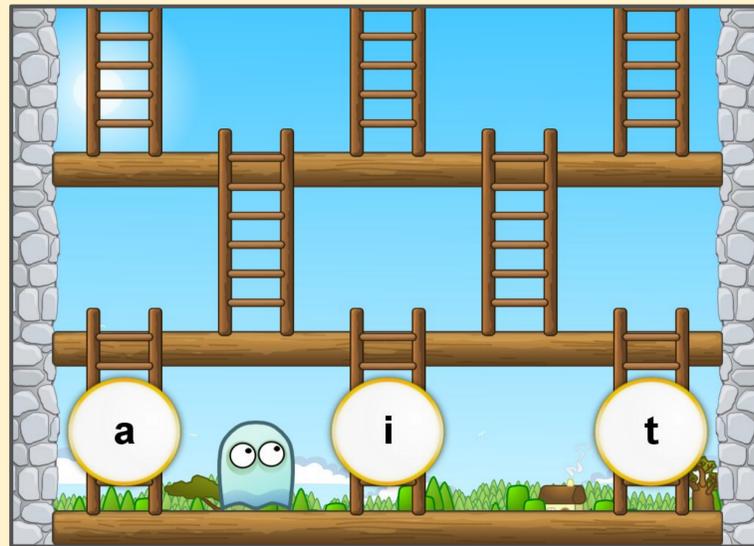


Figure 1. One of the tasks in the GraphoGame - the child hears a sound and chooses the corresponding letter

	R ²	Adj. R ²	R ² change	B	F change	df
Model 1						
Screening tasks (total score)	.31	.30		-.56***	23.25***	52
Model 2						
Screening tasks (total score)	.51	.49	.20	-.64***	20.41***	51
WISC-III Digit Span				.45***		
Model 3						
Screening tasks (total score)	.56	.54	.05	-.65***	6.20*	50
WISC-III Digit Span				.42***		
RAN: Letters (time)				-.24*		
Model 4						
Screening tasks (total score)	.61	.58	.05	-.63***	5.93*	49
WISC-III Digit Span				.33**		
RAN: Letters (time)				-.23*		
NEPSY-II Phonological Processing				.24*		

*** p<.001** p<.01, * p<.05

Table 1. Stepwise regression analysis of the tests predicting the rate of response to the early reading intervention

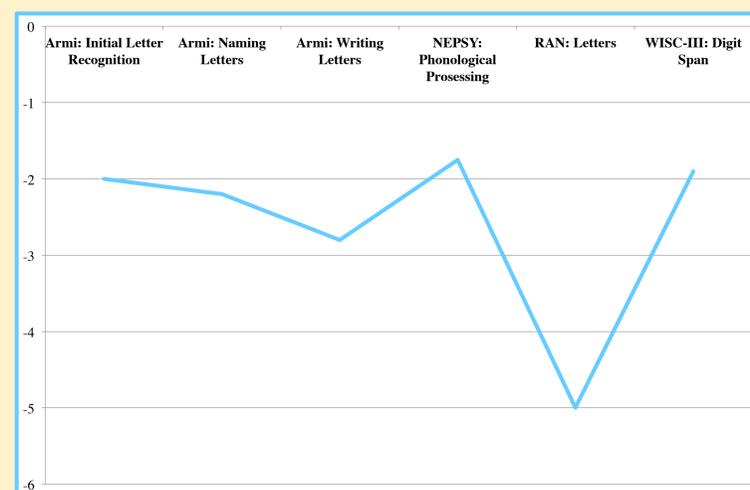


Figure 2. Performance of the treatment resisters (n = 4) in the most essential screening tasks in the beginning of the first grade

Results

In a series of stepwise regression analysis the model consisting of four variables – the total score of screening tests, phonological processing, rapid letter naming, and verbal working memory - explained the most of the variance on the amount of respond to the evidence-based interventions carried out during the fall term of the first grade being sufficient for most of the at-risk children (Table 1).

The treatment resisters (n = 4) differed from each other regarding the occurrence and severity of attentional, verbal and motor difficulties. On the other hand, there were important aspects in common - the connective factors between these four dyslexic children were remarkable difficulties in rapid naming, and in phonological processing (Figure 2), as well as in self-esteem and motivation.

Conclusions

The results indicate that strengths in phonological processing and verbal short term memory predicted the rate of benefiting from the reading interventions. Slow naming rate, on the other hand, was related to the slow progress despite of the given support.

The results of the study demonstrated, that at school entry we can identify the children in need for intensive literacy support, letter knowledge, phonological awareness and rapid automatized naming being the most important skills to assess.

The most vulnerable at-risk children need individualized, long-lasting training in order to achieve adequate literacy skills. Their intervention should reach attentional and motivational aspects and strengthening of self-esteem and metacognitive skills as well.

Literature cited

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Acknowledgments

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More information

on Rehabilitation Center Nekku can be obtained at www.neuronekku.net, and on the issues related to the GraphoGame info.graphogame.com.