

# Effectiveness of Treatment Approaches for Children and Adolescents with Reading Disabilities: A Meta-Analysis of Randomized Controlled Trials

eTale 2022



The present meta-analysis extracts the results of all the available randomised controlled trials. The results revealed that phonics instruction is not only the most frequently investigated treatment approach but also the only approach whose efficacy on reading and spelling performance in children and adolescents with reading disabilities is statistically confirmed.

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Source: Galuschka, K., Ise, E., Krick, K. & Schulte-Körne, G. (2014). Effectiveness of treatment approaches for children and adolescents with reading disabilities: A meta-analysis of randomized controlled trials. *PloS ONE*, 9(2), e89900, DOI: 10.1371/journal.pone.0089900

Children and adolescents with reading disabilities experience

a significant impairment in terms of the acquisition of reading and spelling skills. The present meta-analysis extracts the results of all available randomised controlled trials. The aim was to determine the effectiveness of different treatment approaches and the impact of various factors on the efficacy of interventions. Twenty-two randomised controlled trials with a total of forty-nine comparisons of experimental and control groups were included. The results revealed that phonics instruction is not only the most frequently investigated treatment approach but also the only approach whose efficacy on reading and spelling performance in children and adolescents with reading disabilities is statistically confirmed.

- Children, adolescents and adults with reading disabilities (dyslexia) experience a significant impairment with regard to the acquisition of reading accuracy, reading fluency, reading comprehension and spelling skills, which cannot be accounted for by low IQs, visual acuity problems, neurological damage or poor educational opportunities.
- Reading disability has a genetic basis, and the underlying neurobiological and cognitive causes are largely debated.
- A large number of interventions and therapies, derived from various treatment approaches, have been constructed and evaluated.
- The National Reading Panel's (NRP) review found that systematic instruction in learning letter sound relations and in blending sounds to form words is most effective for improving reading and spelling skills in disabled readers.

### **Different treatment approaches**

- Phonemic awareness instruction (n = 3)
- Phonics instruction (n = 29)
- Reading fluency training (n = 5)

- Reading comprehension training (n = 3)
- Auditory training (n = 3)
- Medical treatment (n = 2)
- Coloured overlays (n = 4)



## The present study

The present meta-analysis has two advantages over previously published work. First, due to the inclusion of exclusively randomised controlled trials (RCTs), the observed effect sizes can most likely be attributed to the intervention. Second, because all the available RCTs are integrated, it is possible to compare the effectiveness of different treatment approaches.

### Goals

- 1. The first aim is to determine the efficacy of different treatment approaches on the reading and spelling performance of reading-disabled children and adolescents.*
- 2. The second aim is to explore the impact of various factors on the efficacy of these treatment approaches.*

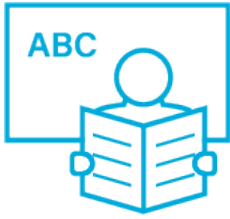
The **present meta-analysis** consisted of 22 RCTs. There were 1,138 participants in the experimental groups and 764 participants in the control groups. Treatment approaches were classified into distinct categories based on the description of the intervention in the report, such as phonemic awareness instruction, which included interventions that foster the ability to recognise and manipulate phonemes in words. Another example category was phonics instruction, which systematically

teaches letter-sound correspondences and decoding strategies that involve blending or segmenting individual letters or phonemes or dividing a spoken or written word into syllables or onsets and rimes.



## Findings

- All the included studies reported the results of reading measures.
- Phonics instruction was investigated most often, and this approach was the only one whose effectiveness on reading performance was statistically confirmed. The mean effect size for phonics instruction was  $g'=0.322$ , which suggests a small but statistically significant effect.
- Intervention studies with mild reading-disabled children and adolescents reported a slightly higher mean effect size compared with studies that included moderate or severe reading-disabled study subjects.
- Interventions that lasted more than 12 weeks tended to show higher effect sizes than shorter interventions.
- Ten trials (containing eighteen comparisons) conducted spelling tests before and after treatment.
- Only in the case of phonics instruction was it possible to compute a mean effect size, which was small but statistically significant ( $g'=0.336$ ).



## Summary

- The results revealed that phonics instruction is the most intensively investigated treatment approach, and it is the only approach whose effectiveness on reading and spelling performance in children and adolescents with reading disabilities is statistically confirmed.
- Thus, the systematic instruction of letter-sound correspondences and decoding strategies, and the application of these skills in reading and writing activities, is the most effective method for improving the literacy skills of children and adolescents with reading disabilities.
- Phonics instruction combines elements of reading fluency training and phonemic awareness training, but neither one alone is sufficient to achieve substantial improvements.