Auditory T2 T3
Intelligence School WPT
25.12 24.62 27.43
Reading, spelling studying pupils with Reading, spelling School
Working memory Post

• children and children who are suffering from learning difficulties and / or intellectual disabilities.

We are investigating the effects of a word-picture training (WPT) which is based on statistical and semantic learning on reading in healthy elementary school children and children who are suffering from learning difficulties and / or intellectual disabilities.

Introduction

There is convincing evidence that phonological, orthographic and semantic processes influence children’s ability to learn reading and spelling words. By frequent reading, children acquire implicit knowledge about the frequency of letter patterns in written words, and they use this knowledge during reading and spelling (Pollo et al., 2009). Additionally, semantic connections facilitate the storing of words in memory (Wang et al., 2011).

First study: 3 interventions with elementary school children

Participants & Methods
132 children from regular elementary schools in Switzerland
• 8-11 years old (2nd, 3rd or 4th graders)
• focused on whole school class interventions
• studying pupils with diagnosed learning disabilities or not diagnosed learning difficulties

Pre-Tests Intervention Post-Tests Delayed Post-Tests

• Auditory & visual processing
• Phonological awareness
• Reading, spelling
• Working memory
• School behavior
• Intelligence

Word-picture Training (WPT)
Working memory training (Brain Twister, BT)
Auditory-visual matching training (Audilex, AL)

• Auditory & visual processing
• Phonological awareness
• Reading, spelling
• Working memory
• School behavior
• Intelligence

Training: 3x / week, 15min / session, during 8 weeks = 24 training sessions with educator or psychologist

Results

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<th>BT</th>
<th>AL</th>
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<td>Interventions</td>
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<td>Percent rank</td>
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<td>Pretest Reading comprehension</td>
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<td>Pretest spelling</td>
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<td>Posttest reading comprehension</td>
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<td>Posttest spelling</td>
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The word-picture training (WPT) led to substantial gains in reading accuracy in comparison to the working memory training (BT). Within the word-picture intervention group, children with diagnosed learning disabilities profited more in spelling as children without learning difficulties. Children without learning difficulties benefited more in word comprehension as children with learning difficulties.

General conclusions

Implicit learning processes like statistical learning seem to be largely independent of IQ and age. Our findings highlight the need for frequent reading trainings with semantic connections in order to support the acquisition of literacy skills.


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Second study: word-picture training in curative education schools

Participants & Methods
50 children and adolescents from curative education schools in Switzerland with intellectual disabilities (IQ < 75).
• 9-18 years old
• 2 training groups (waiting control group design)
• Test battery (T1, T2, T3): phonological awareness, reading, spelling, attention, intelligence, verbal memory, school behavior

Assessment T1 (Group A & B) Training Group A Assessment T2 (Group A & B) Training Group B Assessment T3 (Group A & B)

Training: 5x / week, 15min / session, during 4 weeks = 20 training sessions with educator or psychologist

The word-picture training led to substantial gains in reading. The effects were preserved six weeks later. No effects were found in spelling.