Predictors for literacy problems in Dutch preschool children with SLI

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Specific Language Impairment (SLI)

- **Definition** (McArthur & Bishop, 2001)
  a failure in the spoken language development despite
  - average nonverbal intelligence
  - adequate hearing and vision
  - absence of neurological, physical, emotional or social problems
  - adequate learning environment

- **Disorder in one or more oral language aspects**
  - phonology
  - semantics
  - morpho-syntax
  - pragmatics

- **Prevalence in kindergarten: 7%** (Tomblin et al., 1997)
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**Dyslexia**

- **Definition** (Stichting Dyslexie Nederland, 2008)
  persistent problems with reading and/or spelling at word level

- **Predictors for dyslexia**
  - letter knowledge at 5-6 years
  - phonology  
    * phonological awareness
    * verbal short-term memory
    * rapid automatized naming (RAN)

- **Prevalence: 5-10%** (Shaywitz, 1998)

**Comorbidity SLI - dyslexia**

- **Prevalence: inconsistent data**
  12.5% - 85% (McArthur et al., 2000)

- **Possible explanations**
  - problems with phonological processing
  - problems with auditory processing
Longitudinal study

• Research question:
  Which children with SLI develop dyslexia?
  → phonological skills

5-6 y.  6-7 y.  7-8 y.  8-9 y.
KG  G1  G2  G3

Participants

• SLI (n = 18)
  - oral language problems
  - monolingual Dutch speaking
  - no known comorbid problems

• Control (n = 18)
  - matched for:  - gender  - age
  - class  - nonverbal IQ
  - educational level parents
  - no oral language or articulation problems
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Measurements

- **Phonological skills**
  - 5-6 y.
  - 6-7 y.
  - 7-8 y.
  - 8-9 y.

<table>
<thead>
<tr>
<th>age</th>
<th>class</th>
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<tbody>
<tr>
<td>KG</td>
<td>G1</td>
</tr>
<tr>
<td></td>
<td>G2</td>
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<td>G3</td>
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  **phonological awareness**
  - phoneme deletion task
  - spoonerism task
  - nonword repetition test
  - digit span test

  **verbal short-term memory**
  - (Boets et al., 2007; de Jong et al., 2000)
  - (Boets et al., 2006, Gathercole et al., 1994)

  **rapid automatized naming**
  - (van den Bos et al., 2002)
  - colours
  - objects

Measurements

- **Reading and spelling**
  - 5-6 y.
  - 6-7 y.
  - 7-8 y.
  - 8-9 y.

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<thead>
<tr>
<th>age</th>
<th>class</th>
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<tr>
<td>KG3</td>
<td>G1</td>
</tr>
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<td></td>
<td>G2</td>
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<td></td>
<td>G3</td>
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  - word reading test
    - (Brus & Voeten, 1973)
  - nonword reading test
    - (van den Bos et al., 1994)
  - spelling test
    - (Dudal, 2006)
Analysis

- Literacy delay (LD)
  
  G1: word reading or spelling test ≤ -1 SD
  
  AND
  
  G3: word reading or spelling test ≤ -1 SD
  
  SLI-LD: n = 8
  SLI-NL: n = 10
  Control-LD: n = 4
  Control-NL: n = 14

Phonological awareness

- Phoneme deletion
- Spoonerism

Control-NL  n = 14
SLI-NL  n = 10
SLI-LD  n = 8

*p < .10, *p < .05, **p < .01, ***p < .001
by Mixed Model Analysis
(Verbeke & Lessafre, 1997)
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**Verbal short-term memory**

- **Nonword repetition**
  - Control-NL, n = 14
  - SLI-NL, n = 10
  - SLI-LD, n = 8

- **Digit span**
  - Control-NL, n = 14
  - SLI-NL, n = 10
  - SLI-LD, n = 8

- **P-values**
  - ° p < .10, * p < .05, ** p < .01, *** p < .001
  - by Mixed Model Analysis
  - (Verbeke & Lessafre, 1997)

**Rapid automatized naming (RAN)**

- **Colours**
  - Control-NL, n = 14
  - SLI-NL, n = 10
  - SLI-LD, n = 8

- **Objects**
  - Control-NL, n = 14
  - SLI-NL, n = 10
  - SLI-LD, n = 8

- **P-values**
  - ° p < .10, * p < .05, ** p < .01, *** p < .001
  - by Mixed Model Analysis
  - (Verbeke & Lessafre, 1997)
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Conclusions

1. phonological awareness & verbal short-term memory
   - kindergarten
   - kindergarten → Grade 3
2. rapid automatized naming

RAN in kindergarten best predictor for reading and spelling problems in children with SLI

(Vandewalle et al., 2010)

<table>
<thead>
<tr>
<th>SLI-LD</th>
<th>SLI-NL</th>
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<tbody>
<tr>
<td>low score</td>
<td>low score</td>
</tr>
<tr>
<td>remain low</td>
<td>improvement</td>
</tr>
<tr>
<td>low score</td>
<td>normal</td>
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Final conclusion & further research

Final conclusion
- all children with SLI have difficulties with phonological awareness and verbal short-term memory
- SLI-subgroup with in addition problems with RAN in kindergarten → highest risk to develop dyslexia

Suggestions for further research
- higher number of participants
- other languages
Thank you!

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References


References


