Early detection of children at risk of school failure caused by language impairment

The Bergen Logopedic Research Group
(B.LOG)

European CPLOL Congress
Florence
Italy
<table>
<thead>
<tr>
<th>N.</th>
<th>TITLE</th>
<th>AUTHORS</th>
<th>COUNTRY</th>
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<tr>
<td>W5.1</td>
<td>Early predictions of developmental dyslexia. From the Bergen Longitudinal Dyslexia Study</td>
<td>Turid Helland, Frøydis Morken</td>
<td>Norway</td>
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<tr>
<td>W5.2</td>
<td>Predicting dyslexia from a questionnaire given to caretakers of five-year old children</td>
<td>Turid Helland, Jones Lise øen, Frøydis Morken, Marte Rossland, Line Amundsen, Wenche A. Helland</td>
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<td>W5.3</td>
<td>Early registering of language skills in 5-year-olds</td>
<td>Lise Jones, Turid Helland, Lea Garsol, Steffen Nilsen, Wenche Helland</td>
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<td>W5.4</td>
<td>Investigating communication in 5-year-olds</td>
<td>Wenche A Helland, Lise ØJones, Kjersti B Vassaug, Synnøve T Fisketjø, Turid Helland</td>
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<td>W5.5</td>
<td>The linguistic competence of children born with cleft lip and palate malformation</td>
<td>Magnhild Selås, Åse Sivertsen, Nina Helen Pedersen, Turid Helland</td>
<td>Norway</td>
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Developmental and acquired language impairments across lifespan

Today: SLI, PLI, dyslexia

Instance, specific language impairment (SLI), pragmatic language impairment (PLI), dyslexia and aphasia represent serious challenges for many people as to their educational, vocational and social functions.

Our main aim is to provide a comprehensive understanding of the language pathology, and to promote our insight and understanding of language impairments.

Our team consists of researchers with a high expertise within logopedics and linguistics. We are in close cooperation with the Bergen fMRI Group (en/rg/fmri).
Background:
Early predictions of developmental dyslexia
From the The Bergen Longitudinal Dyslexia Study

Turid Helland (presenter)
Frøydis Morken
Speak up!
A longitudinal study of children 5 to 15 years old at risk of developmental dyslexia

Turid Helland, Department of Biological and Medical Psychology/Bergen Logopedic Research Group
Kenneth Hugdahl, Department of Biological and Medical Psychology/Bergen fMRI Group
Sonja Helgesen Ofte, Statped Vest, Bergen

University of Bergen, Statped Vest, Municipalities of Haugesund, Kvinnherad, Førde, Fræna

http://www.uib.no/project/speakup
....followed children at risk of dyslexia and matched controls from they were 5 to 15 years old.

• Main aims:
  1) identify early at-risk factors
  2) assess
      • brain function and
      • neurocognitive skills
  3) in different phases of literacy development
  4) assess the effect of literacy training.

• N = 120 children
Early identification

RI-5 (Risk Index questionnaire, age 5)

...10 years later
(Dyslexia identified at age 11)

- RI-5 score correlated significantly with
  - Literacy scores
  - 10th grade scores
    - L1 (Norwegian)
    - L2 (English)
    - Mathematics
The Bergen longitudinal dyslexia study
Turid Helland, Department of Medical and Biological Psychology, University of Bergen, Norway

Parents of a population based group of 105 five-year old children (52 boys and 53 girls) from a diversity of randomly selected places in Norway answered a questionnaire on risk factors for developmental dyslexia. 13 of the children (5 boys, 8 girls) were identified as dyslexic when they were eleven years old (Helland, Plante & Hugdahl 2011).

**Cognitive level**

<table>
<thead>
<tr>
<th>Task</th>
<th>Dys Mean</th>
<th>SD</th>
<th>Typ Mean</th>
<th>SD</th>
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<td>16.9</td>
<td>6.1</td>
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<tr>
<td>Age 11</td>
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<tr>
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<td>2.0</td>
<td>13.0</td>
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<tr>
<td>RAN</td>
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<td>10.3</td>
<td>34.0</td>
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<tr>
<td>RCFT</td>
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<td>6.4</td>
<td>27.4</td>
<td>4.3</td>
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**Biological level**

![fMRI, pre-literacy phase: at-risk ≠ controls]

**Symptomatic level**

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<th>Typ Mean</th>
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<td>7.1</td>
<td>4.3</td>
<td>9.2</td>
<td>3.6</td>
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<tr>
<td>Letters*</td>
<td>3.5</td>
<td>3.8</td>
<td>7.7</td>
<td>6.6</td>
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<tr>
<td>Age 7</td>
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<tr>
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<td>12.2</td>
<td>3.8</td>
<td>14.4</td>
<td>3.2</td>
</tr>
<tr>
<td>W read***</td>
<td>68.8</td>
<td>21.0</td>
<td>123.</td>
<td>46.6</td>
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<tr>
<td>W spell***</td>
<td>15.9</td>
<td>6.6</td>
<td>27.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Age 11</td>
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</tr>
<tr>
<td>W read**</td>
<td>151.1</td>
<td>23.7</td>
<td>298.1</td>
<td>40.3</td>
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<td>W spell***</td>
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<td>5.0</td>
<td>53.6</td>
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<td>Text r****</td>
<td>80.5</td>
<td>26.7</td>
<td>148.2</td>
<td>32.4</td>
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**Gender distribution and heredity**

- 8 girls: 3 heredity
- 5 boys: 5 heredity

**Differences**

- Decrease by age
- Increase by age
In sum

1. Early identification of children at-risk of developmental dyslexia

2. How the brain works in the transition from illiteracy to literacy

3. Gender and heredity in dyslexia

4. Effects of training:
   - bottom up
   - top down

5. Long term developmental aspect
Conclusions

Risk of dyslexia:
- preschool identification
- immediate assessment

Identified risk:
- evidence-based literacy training

References

STEP 1: USING QUESTIONNAIRES AND OBSERVATION TOOLS IN EARLY (PRESCHOOL) IDENTIFICATION

A BASIS FOR OUR NEW AND ONGOING RESEARCH
2. TRAS
- Pre-school, all
- General communication skills

1. RI-5
- Parents, teacher
- Risk of developmental dyslexia

3. CCC-2
- Parents, teachers
- Specific language impairment
- Pragmatic language impairment

4. Clinical
- Cleft palate
Method

• A total of **99 children** (60 boys; 39 girls) took part in the study
• Recruited from **16 kindergartens** in a major Norwegian city
• Instruments used for assessing language and communication:
  **RI-5, TRAS and CCC-2**
• Completed by **caretakers** and kindergarten **teachers**
• No exclusion criteria
2

RI-5: Identifying children at risk of dyslexia.

Turid Helland, Lise Øen Jones
Frøydis Morken (presenter)
Marte Røssland, Line Amundsen
Wenche Helland
RI-5: Identifying children at risk of dyslexia

**RI-5**

Questionnaire to caretakers of 5-year old children: children who are in their last year of preschool

<table>
<thead>
<tr>
<th>The child’s name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First name:</td>
<td></td>
</tr>
<tr>
<td>Surname:</td>
<td></td>
</tr>
<tr>
<td>Date of birth:</td>
<td></td>
</tr>
<tr>
<td>Age:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Caretaker’s name:</td>
<td></td>
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</tbody>
</table>

Questions concerning the child

Tick the appropriate box

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
</table>

A. Health

1. Is the child’s hearing normal?
2. Is the child’s vision normal?
3. Does the child have frequent earaches?
4. Does the child have any chronic illnesses?
5. Does the child have any physical handicap?
6. Does the child have asthma?
7. Does the child have allergies?

B. Motor skills

1. Is the child left-handed?
2. Does the child walk within expected time?
3. Does the child walk without assistance?
4. Does the child use the playground?
5. Does the child have poor handwriting?
6. Does the child have poor motor function?

C. Language development

1. Is the child’s language development as expected?
2. Is the child’s language comprehension good?
3. Is the child’s vocabulary good?
4. Is the child’s pronunciation good?

D. Special needs educational education

1. Is the child referred for special needs education to the PPT?
2. Does the child receive special needs education?

**RI-5**

Questionnaire to preschool teacher(s) of 5-year old children: children who are in their last year of preschool

<table>
<thead>
<tr>
<th>The child’s name:</th>
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<tr>
<td>Date of birth:</td>
<td></td>
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<tr>
<td>Age:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
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<tr>
<td>Preschool teacher’s name:</td>
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</tbody>
</table>

Questions concerning the child

Tick the appropriate box

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<th>Yes</th>
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RI-5: Categories

- Health
- Laterality
- Motor skills
- Language
- Special needs education
- Heritage
RI-5: Research questions – and answers

**Conclusion:**
RI-5 seems to reliably identify children at risk of dyslexia.
3

Early registration of language skills in 5-year-olds

Lise Ø. Jones (presenter)
Turid Helland
Lea Garshol, Steffen Nilsen
Wenche A. Helland
TRAS (1/2)
Early registration of language skills - observation of language in daily interplay

The overall aim of the instrument:

• Provide kindergarten teachers with more knowledge about children's language development

• Systematic observations of kindergarten children's language skills to identify children at risk of language disorders or delayed language development

(Frost, Færevåg, Horn and Espenakk 2003; 2011)
TRAS (2/2)
Early registration of language skills - observation of language in daily interplay

- A screening instrument for children in kindergarten (age 2-5 years)
- Eight areas based on the three key competences; form, content and language use
- A dynamic screening instrument
Intercorrelations TRAS

- $r = 0.66^{**}$
- $r = 0.56^{**}$
- $r = 0.63^{**}$
Results

• Mean score of the total sample (N=94); M=21.81 (SD=2.59)

• Significant differences between boys (M=21.38 SD=2.93) and girls (M=22.45 SD=1.84; t (92)=-2.10, p=.05) on the total TRAS score

• Significant differences between a TRAS risk group (N=13, 10 boys and 3 girls) (M=16.27 SD=2.11) and a matched control group (M=22.10 SD=1.42)

• TRAS risk group: 76.9 percent chance of being in the risk group of CCC-2 and 36.4 percent chance of being above the cut-off score on RI-5
Concluding remarks

• A low score on TRAS predicts that children are also within the risk group of CCC-2

• Moderate correlations with the other instruments: CCC-2 and RI-5 used in the study

• Screening with TRAS will be a useful approach for early identification of children with language impairment
4
Investigating communication in 5-year-olds

Wenche A. Helland (presenter)

Lise Ø.Jones

Kjersti B. Vasshaug, Synnøve T. Fisketjøn

Turid Helland
The CCC-2 aims to

- Screen for children who are likely to have language impairments
- Identify pragmatic impairments in children with communication problems
- Assist in identifying children who may merit further assessment for ASD

(Bishop, 2003; 2011)
Results

• Altogether 23 children (23.2 %; 18 boys and 5 girls) were identified as language impaired (LI-group)

• 19 children displayed difficulties related to structural aspects of language

• 4 children displayed a language profile indicating pragmatic language impairment

• The LI-group scored significantly lower than the rest of the sample on an overall measure of communication as well as on all subscales of the CCC-2
Results

• In the total sample, no significant differences were identified between boys and girls

• In the LI-group the majority was boys

• Significant correlations were found between the three instruments (CCC-2, TRAS, RI-5) used in the study
Conclusions

• A relatively large group of children was identified as language impaired based on the results from the CCC-2 screening

• A further individual assessment would presumably result in a lower percentage being identified as language impaired

• Combining the three instruments, CCC-2; TRAS and RI-5 may be effective in identifying children who are suspected of language impairments
The linguistic competence of children born with cleft lip and palate malformation

Magnhild Selås (presenter)
Åse Sivertsen
Nina Helen Pedersen
Turid Helland
• Swedish adolescents with cleft lip and/or palate have significantly poorer results than peers when finishing high school (16 years)

Children with non-syndromic cleft lip and/or palate have poorer understanding and poorer linguistic memory than their peers.

Informants

- Children aged 5-6 years
- Different clefts, syndromic and non-syndromic
- October 2014: 11 children
- April 2015: 9 children
CCC-2 scores (N=19)

GCC:  
A+B+C+D+E+F+G+H  
Mean: 67.26, SD: 22.49

SIDC: (E+H+I+J) - (A+B+C+D)  
Mean: 6.11, SD: 8.76

PC:  
D+E+F+G+H  
Mean: 44.00, SD: 13.68

RI-5 (N=8):  
6/8 at risk for dyslexia

Early detection of children at risk of school failure caused by language impairment

Concluding remarks

Turid Helland

The Bergen Logopedic Research Group

(B.LOG)

European CPLOL Congress


Florence

Italy
Concluding remarks

- False positives
- False negatives

<table>
<thead>
<tr>
<th></th>
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<th>CCC-2</th>
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<td>-0.4392</td>
<td>p=.000</td>
</tr>
<tr>
<td>TRAS</td>
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<tr>
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</table>
STEP 2:
- individual testing this fall

Indications of problems:
- evidence-based training
Thanks to:

All the children, kindergartens, parents and students who participated in the studies

- AND TO YOU FOR LISTENING TO US!