Deaf children’s reading compared with hearing dyslexic children

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Study aims

1. Try out tests used to identify dyslexia in hearing children
2. Collect normative data from a large representative sample of deaf children according to communication preference: spoken language (DSp) or BSL (DSi)
3. Compare deaf readers with hearing children with and without dyslexia
Participants

- 130 severely-profoundly prelingually deaf children, of whom 106 had normal NVIQ
  - 68 DSp
  - 38 DSi
- Age 8-12 years, primary education in English
- Information collected on amplification, other languages, additional disabilities, etc.
- 20 hearing dyslexic (HD) children
Comparing the two deaf groups

<table>
<thead>
<tr>
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<th>DSp group</th>
<th>DSi group</th>
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<tbody>
<tr>
<td><strong>Age</strong></td>
<td>MA 132mths (SD 4.4)</td>
<td>MA 130 mths (SD 6.9)</td>
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<tr>
<td><strong>Gender</strong></td>
<td>55% girls 45% boys</td>
<td>40% girls 60% boys</td>
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<tr>
<td><strong>Parent D/H</strong></td>
<td>1% deaf parents 99% hearing parents</td>
<td>26% both parents deaf 11% 1 deaf &amp; 1 hearing parent 63% both parents hearing</td>
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<tr>
<td><strong>Amplification</strong></td>
<td>61% cochlear implants 39% digital aids</td>
<td>19% cochlear implants 63% digital hearing aids 18% no amplification</td>
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</table>
Measures

Vocabulary

Speech reading
Speech intelligibility

Non-verbal

Phonological skills

Phonological tests for deaf children
Test administration

• Quiet, distraction free test environment
• Amplification fully functional
• Optimal seating and lighting
• Access to clear speech patterns to support speech reading
• Testers with experience of deaf children, fluent BSL user tested DSi children
Could the children do the tests?

• All DSp children could complete the full test battery

• DSi children – 73% had unintelligible speech, unable to do phonological tasks that involved speech (so used alternative phonological tests)
Are deaf children with cochlear implants better readers?

- No differences between children in either DSp or DSi according to type of amplification
Comparing deaf and hearing dyslexic children: single word reading

HD children

Darker shading = average readers
Lighter shading = poor readers

DSp children

More poor readers in the deaf groups than the dyslexic group

DSi children**
Single word reading scores in DSi group according to parental hearing status
Comparing deaf and hearing dyslexic children: language

• All poor readers in the deaf groups had very poor language

• Very few children in the hearing dyslexic group had poor language
Phonological skills in DSp and HD children: Below average phonological skills

Expected proportion below average

- Phoneme deletion
- Spoonerisms
- Naming speed for digits

Deaf
Hearing dyslexic
Conclusions

• Deaf children and hearing children with dyslexia have reading difficulties for different reasons
• Half our DSp and over three quarters of our DSi group were poor readers, all with low language scores and weak phonological skills
• Deaf children’s phonological deficits are the same as those found in hearing children with dyslexia
What next?

- These children are poorly equipped for secondary school
- All poor deaf readers need specialist literacy support, interventions that work with hearing dyslexic children should be available to poor deaf readers
- Like hearing children with severe reading difficulties, deaf children need **intensive, individualised, ongoing** interventions to address both their language and phonological deficits
- Ideally, intervention should be early to prevent these problems
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