An investigation of preschool language delay and reading skill at age 9 years in an Irish childhood cohort

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“An investigation of preschool language delay and reading skill at age 9 years in an Irish childhood cohort”
Background

01 Literacy (reading skill) underpins functioning in society

02 Language is central to literacy and learning

03 NB early identification and management of children at risk

The more that you read, the more things you will know. The more that you learn, the more places you’ll go. –Dr. Seuss
Difficulties acquiring age appropriate language skills can occur during the preschool years:

6% (Law et al., 2000)

15% (McLeod and Harrison, 2009)

Reading is a language-based skill / language is core to reading proficiency
Background: Language and Literacy

Language delay = increased risk of literacy, academic, social-emotional difficulties and later unemployment
(Conti-Ramsden et al., 2009; Duff et al., 2015; Law et al., 2009; Yew and O’Kearney, 2013)

Majority of children will outgrow their difficulties
(Law et al., 2000)
However........many ‘resolved’ children perform lower in later childhood and adolescence RE language and literacy (Rescorla, 2009)

Clinical and Educational implications:
Which children are at high risk of poor longitudinal language and reading outcomes?
4 patterns of language development in preschool years

(Law et al., 2012; Heinrich’s et al., 2011; Jin et al., 2020; Zambrana et al., 2014)
Background: Language Development

What are the needs of these two groups?
Research Question

GUI study (O’Toole et al., 2019) identified these patterns in Irish context.

Few studies investigate longitudinal group outcomes on later reading skills (Jin et al., 2020).

How do children identified with language delay in the preschool years perform on assessment of their reading at age 9 years compared with children with typical language development?

Explore the relationship of reported risk factors (e.g. gender, primary caregiver education, English as a second language) with language and reading skills.
Methodology: 20 Variables

Outcome variables

• **Naming Vocabulary Subtest of the British Vocabulary Scales** *(Elliot 1996):*
  - Administered at age 3 years and age 5 years (Waves 2 and 3)
  - Robust measure used in other cohort studies (Law et al., 2012)
  - T-score used in this study, -1.5 SD threshold
  - Not standardised on an Irish population

• **Reading Vocabulary Subtest of the Drumcondra Reading Test** *(ERC, 2007):*
  - Administered at age 9 years (Wave 5)
  - Adapted version, standardised for the GUI sample
  - Logit score used in this study, -1.5 SD threshold
Methodology: Risk factors

Socio-demographic variables:
- Gender
- PCG Education
- Home language

Home learning environment:
- Number of books in the home
- Frequency of weekday reading
- Rating of child’s speaking and reading abilities

Child Factors:
- Emotional/Behaviour difficulties
- Longstanding illness/disability
- Child’s interest in reading
Methodology: Sample

• Growing Up in Ireland **infant cohort**

![Graph showing study sample sizes across waves](image)

- Wave 2: 9,793
- Wave 3: 9,001
- Wave 5: 8,032
- Wave 2,3,5: 7,507
- Complete outcome data: 6,933

• **Sample Bias:** 574 not included due to lack of available language and reading outcomes were statistically different from the final study sample (increased risk factors for language and reading difficulties)
Methodology: Analysis

Descriptive analysis of key covariates

Univariate and multivariable logistic regression adjusting for covariates
Results: Prevalence

6% language delay at 3 years

3% language delay at 5 years

3% reading delay at age 9 years
Results: Prevalence

Typical language development: 93%

Persisting delay: 2%

Resolving delay: 4%

Late onset delay: 1%
## Results: International comparison

<table>
<thead>
<tr>
<th></th>
<th>Current study</th>
<th>Law et al., 2012</th>
<th>Heinrichs et al., 2011</th>
<th>Jin et al., 2020</th>
<th>Zambrana et al., 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td>93.2%</td>
<td>92.7%</td>
<td>85.2%</td>
<td>90.0%</td>
<td>85.5%</td>
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<tr>
<td>Persisting</td>
<td>1.6%</td>
<td>1.5%</td>
<td>2.6%</td>
<td>1.9%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Late Onset</td>
<td>0.9%</td>
<td>1.4%</td>
<td>6.0%</td>
<td>4.5%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Resolving</td>
<td>4.3%</td>
<td>4.4%</td>
<td>6.2%</td>
<td>3.6%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Participant</td>
<td>Growing Up in Ireland n=6,933 Age: 3 &amp; 5 years</td>
<td>UK Millennium Cohort n=13,016 Age: 3 &amp; 5 years</td>
<td>Generation R Study, The Netherlands n=3,759 Age: 1½ &amp; 2½ years</td>
<td>Norwegian Mother, Father and Child Cohort Study N=8,731 Age: 3 &amp; 5 years</td>
<td>Norwegian Mother and Child Cohort Study n=10,587 Age: 3 &amp; 5 years</td>
</tr>
</tbody>
</table>
Results: Adjusted Regression Analysis
Reading delay

✔ **Adjusted for 6 covariates:**
  - Gender, PCG education, Home language, SDQ Score, Longstanding illness/disability, Number of children’s books in the home

✔ **Comparison group:**
  - Typical language development

- **Persisting Language delay:** 8.73 AOR (95% CI: 4.35-17.50)
- **Late Onset Language delay:** 7.09 AOR (95% CI: 3.14-16.03)
- **Resolving Language delay:** 2.45 AOR (95% CI: 1.46-4.13)
Results: Other associations

- **Gender:** Male
  - 1.14 AOR
  - (95% CI: 0.83-1.57)

- **PCG Education:** Junior Cert or lower
  - 3.70 AOR
  - (95% CI: 2.16-6.34)

- **Longstanding Illness/Disability:**
  - 1.62 AOR
  - (95% CI: 1.15-2.28)

- **Less than 10 books**
  - 2.14 AOR
  - (95% CI: 1.32-3.45)

- **Home Language:**
  - Irish 4.16 AOR
  - (95% CI: 1.21-14.34)

- **Other**
  - 0.46 AOR
  - (95% CI: 0.21-1.01)

- **SDQ Borderline/Abnormal**
  - 1.95 AOR
  - (95% CI: 1.32-2.84)
Results: Discussion

Preschool years are a **period of unstable** language development.

Preschool language delay **increases risk** of reading delay at age 9 years.

Delay at age **5 years** is more predictive of reading difficulties than at 3 years (AOR of 4.89 v AOR of 2.13).

Language delay is **one of strongest predictors** of reading delay.

Low level of **PCG education** and reduced **number of books** also identified as increasing risk of reading difficulties.
Children at risk of reading difficulties can be identified prior to commencing formal education.

Children with apparently ‘resolved’ early language delay remain twice as likely to present with reading delay as typically developing peers.

This group are less likely to access services.

How do we monitor and support these children with pre literacy and early literacy development?

Importance of timely identification of at-risk children and preventative interventions.
Thank-you

Questions?

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