Children’s Speech and Literacy Difficulties
A Psycholinguistic Framework for Research and Practice

(Summary - Selected Slides)
Joy Stackhouse
University of Sheffield, UK

Aims of talk:
• Introduce a psycholinguistic way of thinking about assessment and intervention.
• Summarise research findings from Case Studies and Group Studies
• Focus: speech, phonological awareness and spelling
• Demonstrate use of the Speech Processing Profile from the psycholinguistic framework

Lexical Representations
• Semantic
• Grammar
• Phonological
• Motor program
• Orthographic
• Orthographic program

Literacy: Reading
• Reading Comprehension
• Reading Aloud
  Context
  Single Words: familiar
  new

Literacy: Writing
Spontaneous writing
Spelling
Copying
Handwriting

Case Presentation: Zoe
Persisting Speech and Literacy Difficulties at CA 5 and CA9

Chapter 10 in:

 Psycholinguistic assessment detects if underlying speech processing difficulties persist even if ‘surface’ speech output has improved.

Longitudinal Study
• Used psycholinguistic assessments (speech, language and literacy)
• To compare children with and without speech difficulties
  Over age range 4–7 years.
• Which children at risk for literacy difficulties?
• Which test(s) most sensitive?
Matched Pairs Design
- Recruited 62 children with primary speech difficulties at 3:06
- Core Group of 47 at CA 4
- Assessed at mean age: 4:07, 5:08, 6:08.
- Each matched to a control child: age, nonverbal IQ, gender, educational background.

Subgroups
- Speech
- Language
- Speech input

Results of Longitudinal Study
- Children who have speech AND language problems more likely to have literacy problems than those who have speech OR language problems.
- Children with speech AND language problems had more severe speech difficulties plus difficulties with speech input, phoneme awareness, and letter knowledge.
- Children with persisting speech difficulties are likely to have associated spelling difficulties.
- Critical Age Hypothesis: Children who have not resolved their speech and/or language problems by ~CA 5:6 are likely to have associated literacy problems.

Psycholinguistic Assessment

INPUT
- Does the child have adequate auditory perception?
- Can the child discriminate speech sounds without reference to lexical representations?
- Can the child access accurate motor programmes?
- Can the child manipulate phonological units?
- Can the child articulate speech without reference to lexical representations?
- Can the child articulate real words accurately?
- Does the child have language specific representations of word structures?

OUTPUT
- Is the child aware of the internal structure of phonological reps.?
- Are the child’s phonological representations accurate?
- Can the child discriminate between real words?

Subgroups
- Speech
- Language
- Speech input

Children in the SATS Study: CA:7.0
- 39 children – diagnosis of speech difficulties at CA 4 years
  - Resolved: 11
  - Persisting: 28 (26/28 speech & language difficulties)
- 35 control children matched at preschool on age, nonverbal ability and gender.

Resolved?
Case Study: Luke

From Speech Difficulties to Dyslexia,

% Children at Level 2 on SATS

Resolved? Case Study: Luke

CA 3:6
Referred to Speech Therapy

CA 4:0
- Obvious speech difficulties
- Language development age-appropriate

CA 5:6
- 'Resolved' speech difficulties - Discharged

Psycholinguistic assessment uncovers 'hidden' early signs of literacy difficulties and identifies strengths and weaknesses.

Luke CA 6:05

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>Intelligible speech</td>
<td>Auditory Disc - Voicing</td>
</tr>
<tr>
<td>Language</td>
<td>Repeating Non-words</td>
</tr>
<tr>
<td>Naming Pictures</td>
<td>Phoneme Tasks (deletion/completion)</td>
</tr>
<tr>
<td>Repeting real words</td>
<td>Letter Sounds</td>
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<tr>
<td>Rhyme Production</td>
<td>Reading</td>
</tr>
<tr>
<td>Letter Names</td>
<td>Spelling</td>
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</table>

Luke (6:05) - Spelling from Pictures

<table>
<thead>
<tr>
<th>Picture</th>
<th>Spelling</th>
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<tbody>
<tr>
<td>Rabbit</td>
<td>RAt</td>
</tr>
<tr>
<td>Tiger</td>
<td>Tk</td>
</tr>
<tr>
<td>Pig</td>
<td>Bk</td>
</tr>
<tr>
<td>Dog</td>
<td>Dk</td>
</tr>
<tr>
<td>Gorilla</td>
<td>K</td>
</tr>
<tr>
<td>Giraffe</td>
<td>V</td>
</tr>
<tr>
<td>Butterfly</td>
<td>Bt</td>
</tr>
<tr>
<td>Elephant</td>
<td>Et</td>
</tr>
</tbody>
</table>

Three Children - CA 5-6

'Can’t say k'

- Speech Assessment - Describes:
  - Produce /k/ as /t/ in initial position
  - 'tar' - car & tar; 'tea' - tea & key
  - Fronting
- Psycholinguistic Assessment
  Why?

Table:

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<tr>
<th>N/A</th>
<th>Auditory Discrimination</th>
<th>Articulation</th>
<th>Phonological</th>
<th>Articulation</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>√</td>
<td>√</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>X</td>
<td>X</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>√</td>
<td>X</td>
<td>√</td>
<td></td>
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</tbody>
</table>

Feeling, stopping are descriptions not explanations.

- Children can make the same speech error for different reasons.
- Speech errors arise from different sources within the same child.
  e.g. Zoe: voicing (input), fronting (output).

Phonetic /phonological analysis

What to target?

Psycholinguistic Information

Why and How?
**Book 4: Compendium**

- 30 auditory and speech tasks
- A questionnaire format
- Use of the task
- Psycholinguistic analysis of the task
- Level on the speech processing profile
- Stimuli - Prompts supplied on CD-ROM
- Procedure
- Scoring
- Normative data
- Questions to ask
- Summary of Research Findings

**References**


**Compendium of Auditory and Speech Tasks**

1. A Psycholinguistic Approach
2. Development of the Assessment Tasks and Narrative Data
3. Auditory Lexical Discrimination
4. Auditory Lexical Discrimination
5. Speech Production: Single Words
6. Speech Production: Connected Speech
7. Speech Accuracy, Rate, and Coarticulation
8. Producing Persistent Speech Difficulties
9. Assessing Risk Factors through Questionnaires
10. Using Auditory and Speech Tasks in Practice
11. Appendices
12. CD-ROM – Practice and Score Sheets

**Speech Processing Model**

Speech Processing Model

1. Input
2. Auditory Processing
3. Auditory-Linguistic Representation
4. Articulatory Processes
5. Output
6. Motor Control