Which Kindergarten factors predict G2 & G3 word recognition and spelling?

**Factors Most Directly Involved in Word Identification / Spelling** (Hook & Haynes, 2015)

- Attention
- Executive Function
- Memory
- Oral Motor / Visual Motor
- Automaticity
- Fluency
- Comprehension / Expression
- Morphology
- Syntax
- Semantics
- Discourse
- Pragmatics

Extrinsic Factors: Culture, Home & Teaching Environments

**What level of phonological awareness is being tested?**

| Say sunshine | Now say it again, but don’t say shine | Answers: ? |
| Say picnic | Now say it again, but don’t say pic | nic |
| Say cucumber | Now say it again, but don’t say cu | ? |
| Say coat | Now say it again, but don’t say /k/ | oat |
| Say meat | Now say it again, but don’t say /m/ | eat |
| Say take | Now say it again, but don’t say /t/ | ache |
| Say game | Now say it again, but don’t say /g/ | gay |
| Say wrote | Now say it again, but don’t say /w/ | row |
| Say please | Now say it again, but don’t say /pl/ | plea |
| Say clap | Now say it again, but don’t say /kl/ | lap |
| Say play | Now say it again, but don’t say /pl/ | lay |
| Say stale | Now say it again, but don’t say /stl/ | sale |
| Say smack | Now say it again, but don’t say /smk/ | ? |

Examples from Rosner Test of Auditory Analysis Skills
See also CTOPP, Sound Blending & Elision Sub-Tests

**Phonological Awareness Continuum of Difficulty**

- **EASY**
  - RHYME (dog-fog)
  - COMPOUND WORDS (hot/dog; pop/corn)
  - SYLLABLES (hap, Loy)

- **DIFFICULT**
  - PHONEMES (s-k-i-)

“Phonological awareness” the ability to consciously reflect on the sound structure of language.

“Phonemic awareness”: phonological awareness at the phoneme-level.
1. **Phonological awareness** performance is the single strongest intra-child predictor of word recognition ability.

2. **Phonological awareness** performance is highly predictive of spelling performance.

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### Teaching Recommendations

1. Teach PA early, (and in conjunction with decoding and encoding of phonetically regular words.)

2. In addition, teach phonological awareness of new vocabulary words to aid recall and production in language formulation tasks.

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### What is “Orthography”? 

- Orthographic processing = the ability to visually perceive, remember, and produce letter symbol units of different sizes.

- Grade school word identification and spelling involve the abilities to identify and recall letters and specific letter patterns through the orthographic processing system (Share & Stanovich, 1995; Badian, 1994, 1997, 2005).

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### Letter Identification

<table>
<thead>
<tr>
<th>g</th>
<th>O</th>
<th>N</th>
<th>s</th>
<th>y</th>
<th>J</th>
<th>n</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
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</tbody>
</table>

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**Phonics** involves the application of rules for combining sounds with orthographic units when reading and/or spelling.
Kindergarten **orthographic** awareness -- **letter naming** and **letter formation** -- is a second, powerful predictor of early grade school word recognition and spelling skills.

### Diagnostic Implications

1. Letter identification is an early indicator of linkage of phonological information with orthographic information.
2. In Kindergarteners, letter identification is a powerful predictor of G2 and G3 Word **attack** and spelling skills.

### Teaching Recommendations

1. Teach letter identification early using multi-sensory teaching principles
2. Teach letter names to automaticity
3. Teach early letter sound correspondences systematically and in conjunction with phonological awareness

### Which Kindergarten factors predict grade school **automaticity and fluency** for reading/writing?

### Automaticity & Fluency’s Critical Mediating Role(s):

- Word Identification/Spelling
- Orthographic Processing
- Phonological Processing
- Orthographic/Phonological Association
- Oral Motor/Visual Motor
- Morphology Syntax Semantics Discourse Pragmatics
- Automaticity
- Comprehension/Expression

Extrinsic Factors: Culture, Home & Teaching Environments

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“**Automaticity**”: efficiency (accuracy + speed) of reading/spelling at the **letter** and **word** level.

“**Fluency**”: efficiency of reading/writing at the **text** level.
Automaticity Subtests (TOWRE-2; norms begin at age 6)

<table>
<thead>
<tr>
<th>Phonemic Decoding Efficiency</th>
<th>Sight Word Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ba</td>
<td>on</td>
</tr>
<tr>
<td>um</td>
<td>my</td>
</tr>
<tr>
<td>fos</td>
<td>bee</td>
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<tr>
<td>gan</td>
<td>old</td>
</tr>
<tr>
<td>rup</td>
<td>warm</td>
</tr>
<tr>
<td>nasp</td>
<td>bone</td>
</tr>
<tr>
<td>luddy</td>
<td>most</td>
</tr>
</tbody>
</table>

Example of DIBELS Accuracy/Fluency
(DIBELS norms begin at Kindergarten)

- yiz
- wan
- zoc
- ful
- mik
- zum
- nuf
- kun
- ruv
- fod
- vep
- ij
- op
- juj
- sug
- zuz
- ov
- vit
- wam
- buk
- ef
- luk
- tev
- lof
- kom
- juf
- tam
- nol
- rez
- kec
- pum
- poz
- mum
- ol
- kav

Rapid Automatic Naming (RAN) Fluency

Rapid Automatic Naming (RAN), Objects

Rapid Automatic Naming (RAN), Letters

Diagnostic Implications

RAN performance taps into rate of phonological retrieval.

It follows that RAN tasks:
1. Predict decoding automaticity and fluency (digits & letters), particularly in the early grades (Wolf, 1997); (objects = vocabulary)
2. Appear to predict delayed word retrieval in online spoken and written language formulation tasks (Jennings & Haynes, 2002).
### Double Deficit Hypothesis
(Wolf, 1997, 2002)

<table>
<thead>
<tr>
<th>Good, Rapid Automatic Naming (RAN) Speed</th>
<th>Poor, Rapid Automatic Naming (RAN) Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Phonological Awareness</td>
<td>Poor Phonological Awareness</td>
</tr>
<tr>
<td>Good, Rapid Automatic Naming (RAN) Speed</td>
<td>Poor decoding, Impaired fluency and comprehension</td>
</tr>
</tbody>
</table>

### Classic “Double Deficit” Pattern

<table>
<thead>
<tr>
<th>Poor, Rapid Automatic Naming (RAN) Speed</th>
<th>Poor decoding, Poor fluency, Severely impaired comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Phonological Awareness</td>
<td></td>
</tr>
</tbody>
</table>

### Automaticity & Fluency’s Critical Mediating Role(s):

- Word Identification/Spelling
- Orthographic Processing
- Phonological Processing
- Orthographic/Phonological Association
- Oral Motor/Visual Motor

**Extrinsic Factors:** Culture, Home & Teaching Environments
Diagnostic Implications

1. Children with deficits in both phonological awareness and rapid retrieval often need intensive teaching of decoding/encoding and automaticity/fluency skills.
2. Children with a double deficit pattern are particularly at risk for oral and written expression difficulties stemming from deficits in spelling and slow retrieval.

Teaching Recommendations

1. Instruct component skills (PA, letter ID, word attack, word identification) so that they are automatic and are later applied fluently at the text level.

   How:
   - Repetition, speed trials
   - Practice word recognition and spelling skills at word, phrase, sentence and discourse levels

   To promote text level fluency, teach:
   - Syntactic chunking & prosody,
   - Syntactic & discourse level anticipation.

   When the rain began to fall, she opened her ? .

Pulling it all Together:
A Few Central Relationships

Longitudinal Relationships

Kindergarten

Receptive & Expressive Vocabulary

Receptive & Expressive Syntax

Grades 2 & 3

Language Comprehension & Expression
Kindergarten identification of dyslexia is critical

1. Weak kindergarten phonological awareness, weak RAN, and weak letter ID in the presence of strong underlying language (vocabulary and sentence processing) is a predicts dyslexia in grade school.

2. For students with long-term un-remediated dyslexia, their decoding deficits often result in deficits in language comprehension.

Dyslexia Compared to Broad-based Language Learning Disability (LLD)

Vocabulary Learning in Non-Remediated Dyslexia

Standard Scores

- : Dyslexic
- : Control

Grade Level
Two Helpful References…
