Do children need explicit instruction in learning to read?

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Patterns in English Spelling

• English spelling has two forms of regularity

  Spelling-sound regularities
  cab, pat, act, sad

  Spelling-meaning regularities
  banker, teacher, builder, gardener

• Considerable debate about how best to facilitate discovery of these regularities (e.g. synthetic phonics, whole language, inquiry-based approaches).
Discovery Learning and Explicit Instruction

Discovery learning is the central pillar of constructivism – learner constructs knowledge for themselves

“... knowledge students construct on their own, for example, is more valuable than the knowledge modeled for them; told to them; or shown, demonstrated, or explained to them by a teacher.” (Loveless, 1998)

In reading acquisition, learners extract regular patterns themselves

“We sit with our children reading whole books, talking about them, sometimes pointing at whole words, sometimes at letters. We sit with them writing shopping lists, labelling things in their rooms, doing texting on phones, planning holidays looking at pictures .... Parents and carers have been doing this for centuries” (Michael Rosen, 2013)
Oral Language Training (Day 1)

- Each adult learns two sets of 24 spoken words
- 6 items in each of 4 categories – animals, tools, vegetables/fruit, vehicles
Each adult then maps these onto two different artificial orthographies.

Both orthographies have one-to-one letter-sound mappings.
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Both orthographies have one-to-one letter-sound mappings.
Orthography Training (Days 2 – 9, ~90-120 mins)

1. Reading aloud x 4 per day  [focus on print-to-sound]

2. Saying meaning x 4 per day

3. a) Select word (1/24) to match picture
   b) Select picture (1/24) to match word  [focus on print-to-meaning]

4. Semantic choice (1/4)
   e.g., Has black and white stripes and hoofs
Testing (Day 10)

1. Reading aloud
2. Spelling-sound generalisation
3. Saying meaning
4. Recognition memory
5. Spelling-meaning generalisation
6. Oral language knowledge

Individual differences measures – word and nonword reading, spelling, vocabulary, naming efficiency, phonological awareness
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Individual differences measures – word and nonword reading, spelling, vocabulary, naming efficiency, phonological awareness
Reading Aloud, Discovery

Proportion of correct responses (%)

Day1  Day2  Day3  Day4  Day5  Day6  Day7  Day8  Day9
• Learning success predicts spelling-sound knowledge
• Learning success predicted by vocabulary and phonological awareness measure
Semantic Generalisation, Discovery

- Only $\frac{1}{2}$ of adults above chance on semantic generalisation
- Those who captured semantic regularity usually failed to capture phonological regularity and vice versa
- Only $\frac{1}{4}$ of adults mastered both types of regularity
- Debrief comments like children learning to read
Summary - Discovery Learning

• Substantial variability in ability of skilled adult readers to discover spelling-sound and spelling-meaning patterns

• Discovering spelling-sound patterns predicted by underlying oral language ability

• Discovering spelling-sound patterns usually traded against discovering spelling-meaning patterns; only ¼ of sample discovered both.

• Implies that some children would extract the main regular patterns, but many wouldn’t without more explicit instruction
Explicit Instruction (Day 2, ~30 mins)

- Explain structure of each alphabet

- Spelling-sound task – each visual symbol presented with accompanying sound

- Spelling-meaning task – each final (silent) letter presented with accompanying meanings for systematic language
Discovery vs Explicit – Reading Aloud

The graph shows the proportion of correct responses over days for the Discovery and Direct methods. The red line represents the Discovery method, and the blue line represents the Direct method. The x-axis represents days from Day 1 to Day 9, and the y-axis represents the proportion of correct responses, ranging from 0.00 to 1.00.
Discovery vs Explicit – Generalisation

**Spelling-sound generalisation**

- **Discovery**: Proportion of correct responses = 0.79
- **Direct**: Proportion of correct responses

**Spelling-meaning generalisation**

- **Discovery**: Proportion of correct responses
- **Direct**: Proportion of correct responses = 0.51
Discovery vs Explicit – Oral Language

Oral Language

Proportion of correct responses

Note. Spoken language was trained only on Day 1.
Conclusions – Explicit Instruction

• Explicit instruction structures future learning

• Explicit instruction learners displayed near ceiling performance from the start; discovery learners never caught up.

• Explicit instruction wipes away diversity in underlying language skills; importance for SEND.

• Explicit instruction on writing system transfers to spoken language knowledge

• Results give strong support to use of explicit instruction when pupils are required to capture underlying regular patterns in a body of knowledge
Thank you!
Training Data – Saying the Meaning, Discovery

Arbitrary / Systematic Collapsed
Training Data – Saying the Meaning, Discovery

OS Name Training Accuracy

Proportion of correct responses (%)

Day1  Day2  Day3  Day4  Day5  Day6  Day7  Day8  Day9
Some participants discovered aspects of the writing system ...

“Symbol at the end of the word showed meaning category, other symbols showed sounds”
“The last symbol told you the category, which meant you didn't have to learn all of the symbols - just the first and last”
“Ignored 4th letter, matched letters onto sounds rather than English letters, learnt quickly so didn't need rules to help”

Some participants really didn’t!

“Sometimes showed meaning (e.g. canoe, tricycle, squirrel and tomato had same symbol”
“No rule or pattern”
“Silent letters at the end, groups had same symbol at the beginning, read words right to left”
“Categories (e.g. transport and animals) have quite similar sounds, used two symbols out of four to discriminate”