

IF READING SCIENCE IS SO ADVANCED, WHY DO SO MANY PEOPLE READ SO POORLY?

Chloë Marshall

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Mind the gap...

Seidenberg (2013) If the science is so advanced how come so many people read so poorly?

Poor literacy in the UK

- 18% of 15-year-olds do not reach the PISA baseline Level 2 of reading proficiency,
 - level at which students begin to demonstrate the reading competencies that will enable them to participate effectively and productively in life.

Mind the gap...

- Seidenberg (2013)
 - If the science is so advanced how come so many people read so poorly?
 - Examines three possibilities:
 - (a) properties of English orthography
 - (b) how reading is taught
 - (c) impact of language background.

Plan of the talk

- Interventions for children with reading difficulties
- Identification of children with reading difficulties
- Concluding remarks

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Interventions

- Target reading itself:
 - Reading Recovery
- Target a range of cognitive processes that underlie reading:
 - Phonology *Phonogame*
 - Perception of speech sounds Fast ForWord
 - Motor activity Brain Gym, the Dore Programme
 - Working memory Cogmed
 - Visual attention

"Extra-large letter spacing improves reading in dyslexia" Zorzi et al (2012) PNAS

- Phonological training:
 - "Although rather successful, this approach is time consuming and difficult to implement in realistic school settings, and the improvements in these subskills do not automatically improve reading"
- A dyslexic child reads in 1 year the same number of words as a good reader in 2 days.
- How do we get children reading more?
- Manipulate print to make it more accessible

Why would this work?

strong reader crowding severe dyslexia impaired reader

А

ando la pera. La bambina asc illo è magro. La quercia si tro fiore è rosso. La bambina ave ola. Il ragazzo non ha né capp stanno saltando sopra il murc no seduti e guardano verso la terrazza potrebbero vedere tu tetto della casa si vede anche to, ma non il bicchiere. L'elef o sul ramo dell'albero. La bar i è verde. I ragazzi raccolgonc

В

I1 ragazzo :. che magro. La qu 10 è ella città. Non SO rosso. La baml è stella, dentro cu 1 ragazzo ha non

Results



• Results obtained *without* any prior training.

"Shorter lines facilitate reading in those who struggle" Schneps et al (2013) *PLOSone*

At nightfall they built fires with pieces of old shoes to keep the mosquitoes away, and watched the stars from beneath the big oak tree where they'd hung a rope to swing from. They played tag, ring-aroundthe-rosy, and hopscotch, and danced around the field singing until Grandpa Tommy yelled for everyone to go to bed. Each night, piles of cousins packed into the crawl space above them." The •house just a few feet from the home house other-telling stories about the headless to articles all ran the streets at night, or the man with no eye photos of then slept until their grandmother chloe f Henrietta's family: her and woke them to the smell of fresh biscui during harvest season, Grandpa Tommyh oldest son and readied them to ride into the town of sitting at his nation's second-largest tobacco market, w dining room Tobacco pageant, and a port where boats of people around the world to smoke. Before leaving home, Tommy would call for the young cousins, who'd nestle into the flat wagon on a bed

END

no gaze shift. crowded cause the text visual percept ci text read in a prior fixetion to suddealy become crewded and confused

Implications for education

- The availability of e-readers raises possibility that dyslexic readers can personalise:
 - the spacing of print, and
 - the number of words on each line
 - to best suit their own needs.



Different formatting likely to work for different readers.

"Action video games make dyslexic children read better" Franceschini et al (2013), *Current Biology*.

 "We demonstrate that only 12 hr of playing action video games—not involving any direct phonological or orthographic training—drastically improve the reading abilities of children with dyslexia."



What type of video game?

- 1) **Extraordinary speed** both in terms of very transient events and in terms of the velocity of moving objects;
- 2) A high degree of perceptual, cognitive, and motor load in the service of an accurate motor plan;
- 3) **Unpredictability** both temporal and spatial;
- 4) An emphasis on **peripheral processing**.





Criticisms

- Very small sample sizes (10 in each group)
- Reminiscent of early studies of Fast ForWord
- Needs replication:
 - Larger samples
 - In other orthographies

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Identification after reading failure

- Readers who are falling behind:
 - generally picked up in schools aged 6,
 - e.g. Reading Recovery
- But official diagnosis takes time and needs to be fought for.
 - 2 "spikes":
 - Primary school (after age 7)
 - 2nd term of university

Identification before reading failure

- "Maternal history of reading difficulty is associated with reduced language-related gray matter in beginning readers" Black et al, 2012, *Neuroimage*.
- "Maturation of auditory evoked potentials from 6 to 48 months: Prediction to 3 and 4 year language and cognitive abilities."

Choudhury & Benasich, 2011, *Clinical Neurophysiology*.

- But:
 - How reliable at individual level?
 - Specificity and sensitivity compared to existing behavioural assessments?
 - Costs
 - Practicality?

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How reading is taught...

 Teachers are expected to teach ALL readers with reading difficulties:



Individualising the curriculum













Seidenberg (2013) again:

- Contemporary reading science has had very little impact on educational practice because of a two-cultures problem separating science and education.
- This disconnection is harmful and connection is extremely difficult to achieve.

The phonics test

- A list of 40 words and non-words, which the child reads one-to-one with a teacher.
- Administered 3rd week of June to all Year 1 pupils in maintained schools, academies and Free Schools
- Introduced in 2012.

What teachers say:

- "The nonsense words were very confusing for children"
- "It undermines pupils' confidence as readers"
- "There is more to reading than just phonics."

The way forward

Seidenberg (2013):

- Contemporary reading science has had very little impact on educational practice because of a two-cultures problem separating science and education.
- This disconnection is harmful and connection is extremely difficult to achieve.
- 1. Reading science included in initial teacher training
- 2. Reading scientists need to spend time in classrooms
- 3. Education needs to be less politicised...