Slide 1

Optimising Cognitive Load and Cognitive Processing for At-Risk and Struggling Readers

Dr Susan Galletly

SEPLA-CON 2023 National Conference
Change, Challenge and Choice
Sydney, Monday 17 July, 2023

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Slide 2

Dr Galletly's SEPLA-CON Presentations:
Handouts for Sessions & Poster: www.susangalletly.com.au

1. Optimising Cognitive Load & Cognitive Processing for At-Risk & Struggling Readers   Monday 11.05-11.45am
2. Poster: The High Cost of Orthographic Disadvantage
3. Exploring Australia's Potential Towards Optimising Language, Learning and Life Outcomes Tuesday 2.20-3pm

Chat with Susan: Tuesday lunch: Poster.
Other breaks: Pro-Ed Australia display

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Slide 3

Conference Poster
– We've Severe Orthographic Disadvantage

Check out the video of the poster at susangalletly.com.au

Download its handout.

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Slide 4

Q: Why is it so hard for so many Aussie children to master reading & writing?

It's all about cognitive load vs cognitive processing

A: We're hit with a massive 'cognitive load crash' of the high cognitive load of learning to read against the low cognitive processing skills of young Aussies, especially those with major risk factors!

- English's complex orthography (26 letters, 44 sounds, >>560 spelling patterns) means learning to read words (a) has VERY high cognitive load and (b) makes massive demands on our children's processing skills.

- We start teaching reading when our kids are very young: 4.5-5yrs.
- Processing capacity is v. small then, esp. if kids are anxious.
- Overwhelmed kids 'give up' (feel incapable), making learning harder.

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What are these major players: cognitive load and cognitive processing?

- o **Cognitive load** = the amount we have to think on and process at any one time, and over time.
- o **Cognitive-processing** = the skills we use in thinking about and processing information.
- o **Cognitive load and cognitive processing work in tandem:**
  - **Easy learning creates low demands for efficient cognitive processing.**
  - **Complex learning creates high demands.**
- **Because they work in tandem, we often use the terms cognitive load and cognitive processing interchangeably**
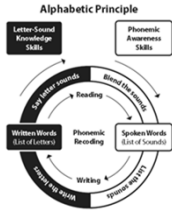
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Slide 6

Regular-orthography nations win for lowest cognitive load and demands on cognitive processing.

- Each letter says one sound, each sound has only that single letter. Learning letter-sounds & sounding out letter-sounds to read & write words is the total curriculum.
- With little confusion occurring, learning has extremely low cognitive load, with minimal demands on children's cognitive processing skills.
- This eases & speeds early literacy development, in all children, including at-risk & disabled readers.
- LOTS of nations (e.g., Finland, Greece, Italy, Spain) are regular-orthography nations with highly regular spelling.
- Taiwan, Japan & China are also regular-orthography nations, despite also having a highly complex orthography:
  - Children first learn to read & write a fully-regular beginners' orthography,
  - then transition very successfully to the complex orthography.

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Regular orthographies have 1:1 matching of letters and sounds, so there's very little to master to learn to read and write

Fleksispel - Stage 1

41 Grapheme-Phoneme Correspondences (GPCS)

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English reading-writing is far from gentle

- 26 letters representing 40+ sounds in 500+ spelling patterns:
  - Letter-sounds are confusing to learn:
    - 12 letter-names don't contain their commonest sound: (a e i o u c g h q r w y),
    - 5 letters start with other letters' sounds: c g u w y, so kids think *W says duh, Y says wuh, U says yuh.*
    - 6 letters have their sound at name end (f l m n s x), so kids think they say eh.
- While most words and syllables are regular, a very large number aren't,

  e.g., try sounding out the letters in 'The toy was here last night.'
- Children often meet confusing spelling patterns

  e.g., was/has, one/bone, two, eight, do/does/done, etc., etc. etc.
- Cognitive load is high during meaningful reading and writing as children have to pause so often to work out words.
- With learning often confusing, cognitive load is high not just when trying to read and write a word, but also when doing meaningful letter sounds.
- English word reading curriculum content is both massive and fraught with potential confusion

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Most nations have it easy compared to us.

- Which nations? Regular-orthography nations, e.g., Italy, Korea, Taiwan, Japan, China, Finland, African nations, Australian indigenous nations.
- Spelling is highly regular, thus – Kid's self-teach v. early.
  - Word reading & writing are mastered incredibly easily.
  - Early intervention is simple, minimal & highly effective.
- Kids start school older, so have high Literate Cultural Capital (LCC) & working memory, making it easier still.
- All children are proficient readers & writers by end Yr2.
- Kids have heightened language & literacy development.
- This makes reading comprehension, written expression & academic learning much easier.
- Parents have good literacy, so kids have high Literate Cultural Capital (LCC) at start of school.
- Risk factors such as low language, phonological awareness & LCC won't block mastery of word reading & writing, then kids can use their literacy proficiency to overcome disadvantages they started school with.

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It's much harder work for us

- It's a VERY big job for our kids to learn to read.
- Time pressure is constant: so much to teach, so little time, such diverse needs. We have to be strategic for success.
- It takes highly skilled resource management & teaching to ensure all kids master reading successfully.
- Young age has massive implications re processing capacity, resilience, stress, failure, and Learned Helplessness.
- Starting school young plus high parent illiteracy means low Literate Cultural Capital at school entry is now a fact of life.
- Word reading, not language skills is the biggest risk area: having highest cognitive load, it's easiest to fail on.
- We need to ensure gentle, effective progress using Successful Engaged Learning.

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For young kids doing complex learning, loss of confidence can be catastrophic

KIDS **MUST** FEEL CAPABLE AND CLEVER IF THEY ARE TO MAKE EFFECTIVE WORD READING PROGRESS

- Learned Helplessness re word reading & writing is VERY common in weak readers:
  - LH = depressed behaviour, passiveness, feeling incapable in that area, seeing success as luck, blocks progress ++.
  - Henry Ford was right: **Whether you think you can't or whether you think you can, you're right!**
  - **When the going gets tough, the depressed give up!**

WE NEED TO ENSURE SUCCESSFUL ENGAGED LEARNING:
- Lots and lots of success, and very little failure.
- Kids enjoying their learning, and feeling capable & clever.

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English readers need strong cognitive-processing skills

- o English readers with risk factors, e.g., language disorder, and children with reading-writing difficulties, have significantly lower skills in
  - Short-term and/or working memory skills.
  - Statistical learning and self-teaching skills.
  - Executive-function skills.
  - Other cognitive-processing skills, e.g., phonological and phonemic awareness.
- Our at-risk children lack these skills: by lowering cognitive load, we can reduce the need for high levels of these skills.

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At present, we're not able to achieve cognitive load as low as in regular-orthography nations!

	Italian Cohort (Regular Orthography)	English Cohort (Complex orthography)
Italian Vs English Readers with Down Syndrome	Cossu et al., (1993): Strong word-reading accuracy: 94% of real words, 88% of unfamiliar words read correctly. Difficulty finding subjects not already reading well.	Groen et al., (2006): One child reading at age-level. Most of control group reading at low level. 30% of control group omitted, as unable to score on tests. Lists other studies showing similarly.

(Cossu et al., 1993; Galletly, 2023 [Tour 4], Groen et al., 2006)

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- Aro (2004): *A transparent orthography treats even a phonologically immature reader in a lenient manner. It helps in explicating the Alphabetic Principle, the correspondence between spoken and written language … It does not burden the beginning reader with a plethora of correspondence rules; and together with systematic phonics teaching it provides the beginning reader with a simple tool for successful word recognition.*

- Cossu et al. (1993): *[The intellectual difficulties of Down syndrome] … have not precluded the children from acquiring the transcoding skills involved in reading …. Despite a mean IQ of 44, these children read regular words, irregular words and nonwords with the same proficiency as normal Italian 7-year-olds.*

- Papadopoulos et al. (2021): *Crosslinguistic studies have shown that students learning to read in a writing system with unreliable and complex GPC rules, such as English, acquire fundamental reading skills more slowly than typical development in more regular orthographies (e.g., Seymour et al., 2003). This finding has been very consistent … no cross-language comparison on early word-level reading [has] provided different findings.*

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Orthographic differences create major literacy differences

- High cognitive load impacts Australian children across the years it takes to become skilled, confident readers and writers.
- English readers weak at these skills tend to develop word-reading, spelling and literacy struggles.
- Regular-orthography readers weak at these skills develop accurate word-reading and spelling.

Finnish 23 GPCs	Italian 33 GPCs	English >> 500 GPCs

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Why? Cognitive Load and Cognitive Processing Skills

English orthography
- Creates high cognitive load, and thus.
- Needs for very healthy cognitive processing skills
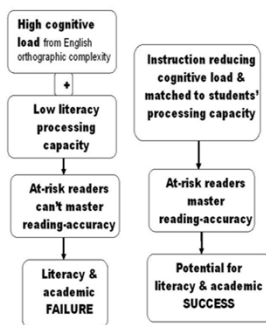- Across the many years it takes to master word-reading & writing.

Regular-orthographies
- Have very low cognitive load.
- Are easy and gentle to master.
- Are quickly mastered in weeks to months.
- Children have strong literacy skills from early primary school.

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Teach using Cognitive Load Theory:

When high load meets weak processing skills….

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Teach using Cognitive Load Theory

For learning to be effective,
Content Load + Task Load < Kids' Processing Capacity

- <u>Content Load</u>:
  - The complexity of the task to be learned: massive for English word reading and spelling.
  - Reduce it by chunking: sequenced learning steps.
- <u>Task Load</u>:
  - The complexity of the learning tasks used to teach the content, created by the types, sequences & clutter of activities we use, reduced greatly through microsteps.
- <u>Processing Capacity (Working Memory)</u>:
  - Smaller in weak readers, reduced by anxiety, expanded by confidence: Working Memory 'cups' that are filled with Content Area & Learning Task load.

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The Cognitive Load rule

Content Load + Task Load < Kids' Processing Capacity

- The total cognitive load of
the amount of content you are teaching
and the thinking required for the activity/game used must always be less than
the limits of the child's processing capacity & anxiety level in the teaching moment.

- In the teaching moment means 'right now', i.e.,
  - Plan your task to have sufficiently low cognitive load.
  - Monitor how the child is coping 'in the teaching moment'.
  - Make microstep changes (harder or easier) as needed.

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Avoid clutter using up processing capacity.

Ensuring your teaching focus is on the skill you want to improve greatly reduces Content Load.

When our focus is misplaced, the learning task we've chosen often adds 'clutter' which may confuse the child, increase Content Load & Task Load, & decrease learning.

Often we're tricked in this area, e.g., what's the teaching versus learning focus of these tasks for a naïve learner vs. an active self-learner:

- A spelling list: farm barn cart car sharp
- Homework task: writing sentences with spelling words.
- Getting weak readers to rewrite all spelling errors you've corrected in their first draft.

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Strategically use subskills to *Build that Wall Strong!*

1. Task Analysis, thinking on subskills (lower & higher bricks).
2. Strategically planning curriculum which has depth across year-levels, pruning less valuable breadth.
3. Helping older struggling readers kids see why it's so powerful to build early skills that are weak:
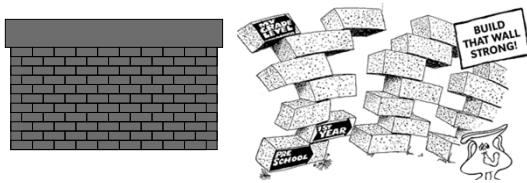
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The ongoing high cognitive load our children experience is not healthy

○ Our children experience heightened cognitive load when reading & writing, across the many years it takes to build fluent word-reading and writing.

○ Ongoing heightened cognitive load impedes children's literacy and language development.

○ It may also be damaging, e.g., Hayiou-Thomas et al.'s (2004) study showed that increasing cognitive load for Grade 1 & 2 UK children with healthy language skills induced patterns of language disorder, i.e., error patterns not seen in healthy-progress children but common in children with language disorder.

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We don't need spelling reform but we'd SHRINK cognitive load using a beginners' orthography before Standard English

- Very low content load & cognitive load for beginners and struggling readers.
- We'd use Taiwan, Japan & China as role-models for 2-Stage early literacy.
- Fleksispel: my fully-regular beginners' orthography, with 5 transitioning stages.
- Available free for non-commercial use to educators & researchers.

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And children would have stronger cognitive-processing & learning skills if we started word-reading later

Future research may explore
Galletly's (2022, 2023) **10 Changes**

- Change 8: *Investigate the potential of fully-regular beginners' orthographies: Research shows they're key*.
This would reduce cognitive load and needs for cognitive-processing
(Role-models: Taiwan, Japan & China use 2-Stage early literacy)

- Change 9: *First, play to learn:
Start Standard English word-reading instruction from mid-Year 2.*
This would mean children would have heightened cognitive-processing skills
(Role models: European nations, children 7-8 years old in Grade 1).

Galletly (2023) *The Research Tours: The Impacts of Orthographic Disadvantage*

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For now, we do our best to make literacy development as gentle & easy as possible

What's the gentlest start we could have?

- One that manages cognitive load magnificently:

  The Cognitive Load Rule: For learning to be effective,
  Content Load + Task Load < Kids' Processing Capacity

- Maximised processing capacity through fun, relaxing, enjoyed activities with minimal stress and pressure.

- We aim for very low cognitive load, scaffolded sequential learning, and successful, engaged learning.

  And, if you're considering Masters or Doctoral studies, there are simple research studies which would build powerful knowledge to help Australia optimise learning & literacy development

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Managing cognitive load makes a huge difference

When instruction and intervention is focused on keeping cognitive load at manageable level, educators will increasingly think of and develop useful high-gain strategies which keep cognitive load low, whilst building powerful skills used across multiple aspects of literacy.

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Be a cognitive load sleuth monitoring cognitive load in planning & each teaching moment.

- Match instruction to children's processing capacity.
- Work to avoid cognitive load crashes of too high cognitive load against too low processing capacity.
- Work to reduce cognitive load:
  - Use careful skill sequencing to keep load manageable.
  - Be skilled in making tasks easier to reduce cognitive load.
  - Teach useful strategies that lower cognitive load.
- Optimise working memory and cognitive processing:
  - Aim for Fat Happy Cups and Successful, Engaged Learning
  - Use scaffolding that 'provides' additional working memory.
 - Automise skills: As skills automise, they've lower cognitive load and lower demands on cognitive processing.

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Effective learning builds from efficient information processing.

Phonological Awareness: Oil to spin our literacy cogs efficiently.

**Working Memory**:
Our cup of thinking space

Long Term Memory:
Skills being automatic, well stored and easily retrieved.
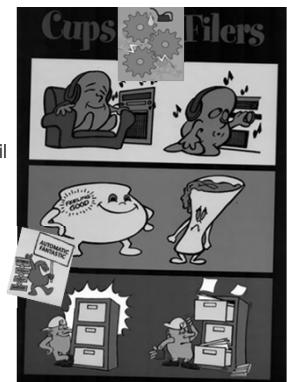
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Analogies for learning: Principles for effective teaching matched to learning needs

- Understand how kids learn and how learning can break down.
- Match instruction to kids' needs.
- Focused on ensuring Successful Engaged Learning, using fun effective activities, with no learning breakdowns.
- Automise skills so they're firmly in place in long term memory, and quickly retrieved when needed.
- Build bricks in the child's learning wall, filling gaps effectively so literacy & learning is strong & effective.
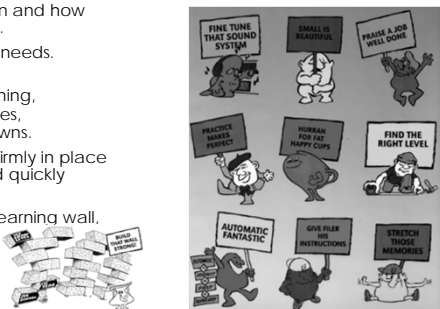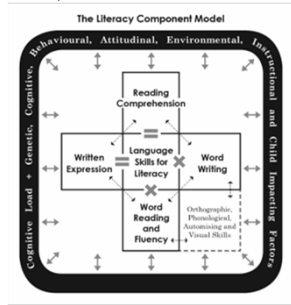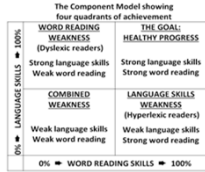

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Games keep processing capacity high, and *support powerful statistical learning*.

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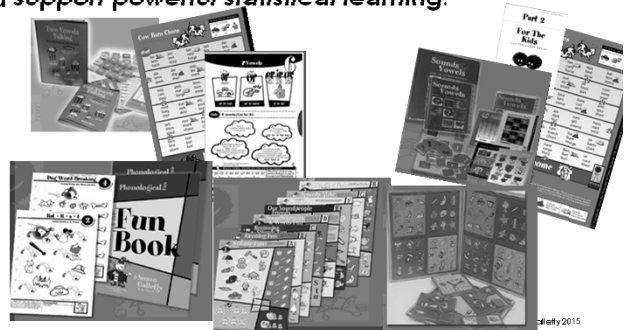
The Literacy Component Model (incorporating the *Simple View)*
(Knight, Galletly & Aprile, 2021, Gough & Tunmer, 1986)

Reading Comprehension
=
Language Comprehension
X
Reading Accuracy

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Think on children's instructional needs for

1. Word Reading

2. Language Comprehension

Using tests of word-reading & language skills, and scatterplots, each child will sit in one of four quadrants, each with a different set of instructional needs.

This can be very useful, e.g., form reading groups based on similar instructional needs.
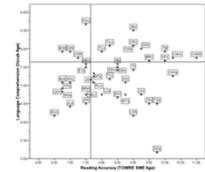
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Change, Challenge & Choice

1 **Challenge: Let's meet the challenge of lowering cognitive load and demands for cognitive processing.**

2 **Change: Let's reflect on our options & make strategic changes in our teaching**.

3 **Choice: Let's choose best methods of lowering cognitive load, and optimising literacy development.**

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Strategies for managing cognitive load

o A huge area, e.g. I present 1 & 2 day seminars on this area.

o Many useful strategies are detailed in Knight, Galletly & Gargett (2017b) *Principles of reading instruction towards optimising reading instruction for at-risk readers in Prep to Year 3.* CQUniversity. (Download free from ResearchGate)

o Today, let's consider some examples of strategies and think on how they can reduce cognitive load and demands for cognitive-processing skills.

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Features of Useful Strategies

o Low cognitive load so processing capacity (working memory) is not overloaded.

o Help children progress quickly in multiple areas.

o Not overly reliant on subskills not yet automatic.

o Simple to teach and easy to learn.

o Easily made enjoyable and fun.

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Strategies for boosting literacy
Easing first draft writing

o Use speech to text software.

o Teach children how to write spelling approximations.

o Build needed spoken language skills to a high level.

o Proofread in 4 cycles.

o Reduce demands for correct spelling:
Make the Goal to *Get Your Fine Mind Down on Paper*

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Use Speech to Text Software

o This greatly reduces cognitive load.
o The language children use improves (opposite
  of Hayiou-Thomas et al.'s (2004) raising cognitive load).
o Writing is now easy and fast.
o Time saved means editing and honing work can be fun.

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Proofread in 4 Stages
(to expand working memory x4)

o Reduce cognitive load to build skills & confidence
o First two language-skill cycles then two editing cycles:

1. M   My   Meaning
2. G   Grandma's   Great words and sentences
3. P   Pig   Punctuation
4. S   Stinks   Spelling

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Guestimating (Brave Spelling) empowers writing

Teach writing of long words as phonemic equivalents
• Build skilled phonological awareness of syllables
  (e.g., *Syllable Sleuthing*, Sounds & Vowels, p. 62-64)
• Teach the 3 rules of writing big words:
  1. Say the word by syllables on your fingers.
  2. Write syllable by syllable.
     1. Flick a finger as you say the syllable.
     2. Write it, & make sure it has a vowel.
  3. Check the word. Count the vowels then read
     syllable by syllable, listening for sounds.
Till skill & confidence builds, any vowel will do:
'*The duneso ate the reptu*' vs '*The dns ate the rpt*'.

Teach the aim of writing as to
'*Get my fine mind down on paper!*'

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Teach Guestimating (Brave Spelling) from Prep (Kinder), with words assigned to each yearlevel.

• Strong push for '*Get your fine minds down on paper*'.
• No push for correct spelling: '*We haven't learnt Y6 spellings yet but that won't stop us using those words in our writing*',
• Strong emphasis on putting a (any) vowel in each syllable.
• Schools win by allocating 'Brave Spelling' words to each year level & scaffolding use of those words in written expression.
• 8 words per yearlevel means that, by Year 4, 24 big words are used regularly in writing.
• Use of these words will encourage risk taking on other words.

Examples of Core Brave Spelling words:

Prep	fantastic	today	happy	very	terrible	gigantic	delicious	quickly
Year 1	wonderful	yesterday	excited	really	dreadful	excited	comfortable	accidentally
Year 2	spectacular	exhausted	satisfied	extremely	revolting	generous	special	fortunately
Year 3	exceptional	reasonable	worried	particularly	terrifying	especially	astonished	scrumptious

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Ease learning so children master reading CVC words
(hat, vet, cut, cute, fresh, crunch)

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Ensure a very gentle start, that readies children for learning to read.

• Alphabet sound songs as well as The Alphabet Song.
• Reading my name deeply (Olliver, Oliver, Olvier).
• Reading a few family names (Mum/Mnm, Dad/Ddd, Smith/Swith).
• Know a tiny group of letters really well, e.g., name, sound, hear them in words, blend them.
• Finding repeated key words in books: Spot, Peppa, Maisie.
• Know our 3 types of words: Regular, Pattern & Tricky Words.

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Introduce words in highly scaffolded ways

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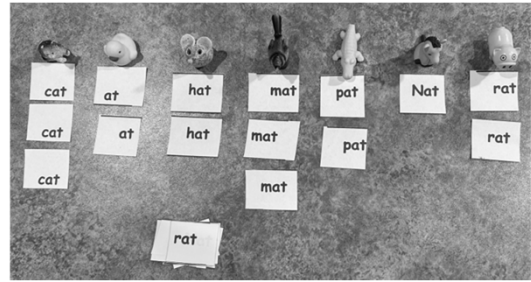
Which animals will win in the Animal Olympics?
Sorting has high instructional intensity (practices/minute).

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Child: *p-i-g?*
(=too hard on my own: Crash Alert!)
Adult: *Puh-ih-guh.*
(adds help)
Child: *Pig!*
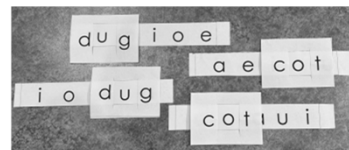(We did it! Keep doing this, and soon, the child will do it alone.)

Provide the scaffolding that's needed, so children are highly successful. Your help 'adds' working memory

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Use activities that are quick, easy and have high instructional intensity (no. of practices per minute)
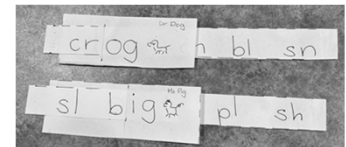
Rhyme blends on to words, to get ready for reading blend words.

Use CVC sliders for 'spelling' fun that's quick & easy.

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Move stepwise from easier to harder learning

Each Phonological Fun section is sequential:
• Build syllable, rhyming & sound skills playfully.
• Build sound, letter & word awareness.
• Identify beginning sounds
• Play with sounds, e.g.,
  generate words with given sounds.
• Blend sounds to make words.
• Identify final sounds.
• Identify middle consonants.
• Work out sound position: start, middle, end.
• Split words into onset & rime.
• List the sounds of 2 & 3 sound words.
• Have fun with vowel sounds.
• Have fun reading & writing 2 sound then 3 sound words.

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Phonological Fun characters & FunTiles help make abstract concepts concrete:

• <u>5 Consonant Characters</u>:
  Beebubee, Feffafeff, Memmumem, Sessussess, Teetutee

• <u>2 Vowel Characters</u>:
  Atty Apple, Ossy Octopus

• <u>Wonder Word Worker</u>

• <u>Syllable FunTiles</u>:
  1 syllable: Frog
  2 syllables: Turtle
  3 syllables: Butterfly

• <u>Rhyme FunTiles</u>:
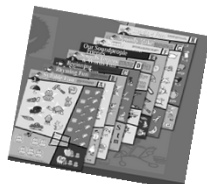 Cat, Jan, Sun, Zog

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Phonological Fun resources
(See online 8min video at www.literacyplus.com.au)

- Standard Masterbook
- Wooden FunTiles
- Blackline CD
- A2 FunCharts
- Rhyming Fun, Syllables Fun & Beginning Fun Tuzzles
- Tuzzles Teach Puzzle Games

Sold through
Pro-Ed Australia
& Tuzzles Teach
Phonological Fun
resources.

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Instructional Intensity (experiences / minute) scaffolds effective statistical learning

- Instructional intensity is the number of practices or exposures to a skill per minute of teaching/learning time.
- Match instructional intensity to the child's needs.
- Use massed practice (lots of practice) & spaced practice.
- Combine this with removing confusion & building confidence for powerful effective learning.
- Be strategic choosing activities,
  - Achieve high practice rates by aiming for high instructional intensity using massed practice.
  - When the curriculum is crowded, games with instructional intensity are a teacher's best friend.
  - 5 to 20 practices/min → faster progress, e.g., Memory (turning over 4 cards each turn), Snap, *Sounds & Vowels* and *Two Vowels Talking* games.

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Use spaced practice very effectively to optimise learning & prevent learning breakdowns

- Achieve high practice rates by choosing activities with high instructional intensity: brief practice sessions occurring multiple times result in lots of practice being achieved.
- Use spaced practice strategically, e.g.,
  - Massed practice till relatively fluent then spaced practice, then move to Memory Stretching (e.g. Snap as testing).
  - Reading games & Memory/Snap homework activities.
  - Small group activities using parent volunteers, trained teacher-aides, trained community members, peer tutoring in class or in school 'reading clubs.'
  - Reading Buddies: Older kids with reading difficulties are effective peer tutors for younger kids as long as the tutor is good at the focus skill. (And both the tutor and tutee progress.)

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Memory & Snap are powerful for massed practice & highest instructional intensity.

Strategic Memory (28 'cards': 7 words, each on 4 cards)
A card game, with all cards spread out face down on the table, taking turns to collect pairs: the winner is the one with the most pairs, after all cards have been turned over:

- Turn over 4 cards, not 2, every turn (This greatly increases instructional intensity).
- The rules for pairs in each turn: No pairs or two pairs: that's the end of your turn. One pair, you get just one extra turn to turn over four cards (and a chance to get a total of 3 pairs for that turn).
- 'Read up the line then count down the line': As you play, line pairs up strategically, face up, ready for 'reading the line'. At the end of the game, you 'read up the line' then count down the line, to see how many pairs you have.

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Play Memory till 'correct' then Snap till Automatic

- Strategic Snap (28 'cards': 7 words, each on 4 cards) A card game with the pack shared out, turning one card over each turn, 'snapping' pairs, with the winner having the whole pack or the most cards
- Share the pack out between players.
- After a Snap, the Snapper puts cards at bottom of pack.
- 'Last Chance!': Players who run out of cards get one chance to get back in, if they get the next Snap.
  - Often kids read lots of words till Snap happens.
  - The reason cards were put at the bottom of your pack is so you know there's some Snaps coming through.
- Advanced/Timed Snap (≥56 'cards': ≥14 words on 4 cards)
  - Combine ≥ 2 card packs. Use a timer, eg 5 mins. The winner is the one with the most cards.

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Enjoy Instructional Intensity ++ through school & home use of 'Strategic Memory/Snap'

- Strategic Memory/Snap (rules discussed earlier) work for word reading, letters, maths facts, vocabulary, etc.
- Teach parents the system in Prep & Year 1, using colours, shapes, letters, numbers, then as part of individual
- Strategic Memory/Snap & Rapid Reads provide highest instructional intensity (practices/minute).
- Download files have lots of these & it's very easy to make others.
- These activities are great for differentiated homework & school activities.

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Regular-Pattern-Tricky categories make word reading more logical for beginning readers

- Teach the Regular-Pattern-Tricky strategy so children are less confused by irregular words (Confusion adds cognitive load).
- English words & syllables use 3 grainsizes (Goswami,2002):
  - Phonemes (sounds) : Regular words, e.g. c-a-t
  - Rimes/orthographic units: Pattern words, e.g., b-all, c-ar
  - Whole words: Tricky words, e.g., one, was.

Regular Words	Pattern Words	Tricky Words
cat trap split "Sound out" v-e-t. Letters say usual sounds.	b**all** l**ight** c**ar** "Use the pattern" b-all c-ar b-oy Remember what the pattern looks like.	**one** d**oes** **eight** "Remember what it looks like" Tricky words have silly spelling. Don't sound them out.

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The word-reading / spelling curriculum

- Letter-sounds: first 1 then 5 then 18 then 26 then >30.
- Sight words: first my name, then 5 words then 10, 20, etc.
- Pattern words: 2 then 10 words, used in reading & writing.
- Phonics: first VC then CVC using aeiou, then steadily thru
  - 29 common vowel GPCs, then rare vowel GPCs
  - Multisyllabic words: 2- then 3-syll, regular then irregular.
- Reading books: brief use of highly predictable texts, then books with less predictable text, using Echo reading, then steadily onto longer-text books as word reading builds.
- Spelling/writing: first garbled letters, then closer attempts:
  - Steadily improving phonemic approximations.
  - Regular-word spellings: first VC & pattern words, then common sight words, then 29 common vowels, etc.
  - Integrated vocab/spelling instruction for rare words/GPCs

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Teaching Pattern Words reduces orthographic complexity & cognitive load

- Patterns help kids transfer from one word to another, e.g.,
  - If a child knows 'ball', transfer to reading 'call tall wall'
  - Write lists of rhyming words using a pattern word, e.g. *boy-zoy-moy-stoy-choy-voy- woy-doy.*
- It's hard to learn lots of vowel spelling rules (e.g., ar, all) but it's easy & fun finding known patterns in words.
- Instead of teaching vowel rules (higher cognitive load), teach a set of sight words to then use as pattern words: b**all** s**ee** b**oy** c**ar** pl**ay** n**ow** my me l**ook** h**er**
- When that pattern (rime) is seen in other words, point out similarities to the pattern word: 'That's like 'boy'….toy!'
- Rhyme is the phonological awareness skill underlying use of pattern words. Build rhyme skills to a fluent level to maximise reading/writing using pattern words.

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## Build rhyme awareness & skills, to maximise pattern (rime) awareness

- Build rhyme awareness eg *Random Rhyming*, Sounds & Vowels, pp.58-59.
- Most pattern words use rimes (Vowel-Consonant/s).
- English vowel GPCs are more consistent in rimes (VC vs V), e.g., oy ar ow ay all vs a e i o u.
- Rhyme is the phonological awareness skill underlying use of pattern words.
- Write lists of rhyming words using a pattern word, e.g. *boy-zoy-moy-stoy-choy-voy-doy.*

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### Give kids lots of fun writing pattern words
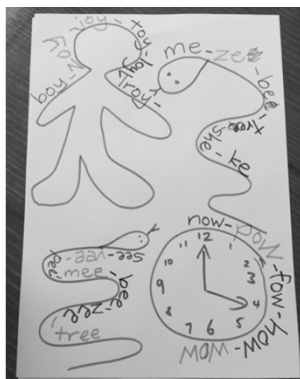
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A gentle start to sight words

- First words are child's name then family names.
- Next words are concrete nouns and action verbs.
- Hold off function words (e.g. *is of the here*) until quite a few concrete words are known.
- Build a cumulative bank of sight words as the child learns them, using them in games and texts.
- Teach words well alone or in a small group.
  - Then mix them with other words the child knows, + support the child reading them in sentences and books.
  - Have lots of practice reading the words in text reading.
- Beware forgetting: If taught in word groups, at-risk readers start forgetting recent words once moved to a new group.
- For 'clever forgetters,' use Memory Stretching (Newsletter 2) to ensure they aren't forgotten.

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First we match name to name, then we read (remember the word without needing to check)
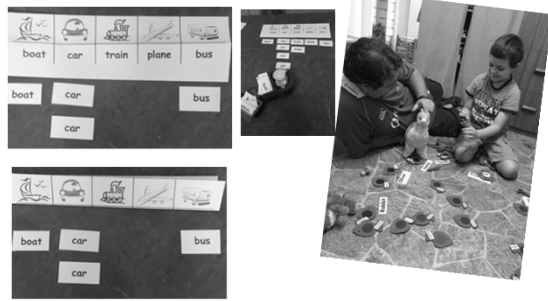
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Games & Fun for First Sight Words

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How well can Oliver read his name?

- Children's reading and writing builds from their strength of neurological representations.
- The tasks we choose result in strong vs. weak learning (representations).

- Oliver can find his name in a page of print.
- How strong is his reading of his name?
- What games/tasks (higher bricks) will create stronger reading and representations?

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The task we're using often deceives us: we think the child's reading is better than it is

- It turns out that Oliver thinks all words starting with O are his name.
- His level of learning is O at the start of words.
- He's only reading 'Oliver' well in the context of Oliver being the only word with O.
- This is a fine start.
- Now he needs fun activities to build stronger representations.

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Thinking on the sequence of subskills that skills build from, helps plan for stronger learning

- Oliver has powerful subskills of being able to read his name:
  - Starting to know the letter O (He thinks some circles are his letter).
  - Locating words starting with O.

- Probably the next skills leading on from those subskills are building increased awareness then skill with:
  - All the letters in his name.
  - The order of the letters in Oliver.

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Choose tasks carefully for balance of clutter vs. child's next steps of learning (skills & subskills).

The tasks we choose limit & encourage learning. Think on
- Skills they focus attention on.
- How much 'clutter' they have (distraction not related to learning).
- **Fun clutter can be good initially when the goal is to hook interest & engagement.**
- Once learning is happening, the learning itself is fun, and fun clutter is less necessary.
- If the task itself is hard, you might reduce clutter by changing tasks.
- Notice time on learning vs. clutter.

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Clutter clutters! Remember the Thumbprint Experiment

- The Thumbprint Experiment (Gough et al, 1992) is worth remembering! Kids taught words on flashcards, one with a thumbprint beside the word, learned that word by the thumbprint not the letters. In retesting, the thumbprint was on another word: most didn't correctly read the original thumbprint word or the new one, saying the original thumbprint word instead.
- Thumbprint = clutter clues, e.g, in a small set of words, kids may be reading pen colour, card colour, word's position in a grid, word length (*crocodile* is the only big word), and the word's first letter (*cup* is the only C word)
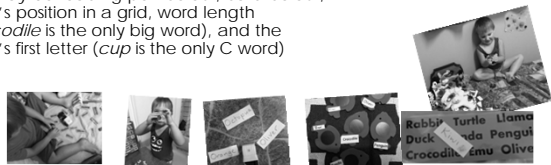
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Handy Hints for Learning Fun

- Often it's your 'bizarre' excitement in the word game that catches the child's interest, and makes him want to play the game again. Ham it up – go right over the top.
- There must be 10-15-20-100 different fun games to do with kids for building sight word skills:
  - Toy trucks, dinosaurs & spaceman pick them up & carry them in diverse vehicles. Lego Men search for them in space. Fish get caught. Octopuses get incredibly excited re words found. Words get jumped over as they're read.
  - Feelie bags have words, and animals whose names are pulled out make their sound in strange and wondrous ways. Word hunts happen, sometimes using magic eyes or glasses to find words hidden in the yard or room.
  - Kids have a special bag/place to put words they know well. Great excitement every time newly learned words go in.

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Handy Hints for Family Names

- 7 words x 4 cards each makes a good game of memory & snap. You may need to include grandparents, the dog or a favourite toy.
- Have the child draw the individual family members/pets and use these for sorting.
- If doing photos or laminating pictures, keep the name separate from the picture, as that way you don't need a new picture when the child moves from matching to early reading.
- Provide family name labels so kids can label paintings & construction pieces as to who they are for.

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Use NOUNS as first sight words

The sequence I use: (Use NEW activities)
  - 7 family names:
    Sam Jones Mum Dad Molly Rover Catty
  - 5 useful nouns: *boy girl dog cat ball.*
  - 5 transport nouns: *plane car boat bus train.*
- Integrate reading in personalised books.
- Then move to less concrete words: sets of 21 words, & pattern words:
  - Always carefully integrate new words with known words (wean off when ready: this will be a different point for different children, depending on how easily words are forgotten)

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Teach abstract words after concrete words

- Teach logographically till phonics skills build.
- Include confusable words: me/my can/car
- The first 21 words:
  - 7: *I am me my see look can*
  - 7: *is at and this here like car*
  - 7: *the you said it in to a*
- Pattern words: b<u>all</u> b<u>oy</u> <u>see</u> m<u>e</u> m<u>y</u> car pl<u>ay</u> n<u>ow</u>
- The next 21 words:
  - 7: little we go Mum with on up
  - 7: one Dad come big in play at
  - 7: do go at in up us

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Start afresh with struggling readers. Teach 17 words using predictable text & sight words

7 family names: *Sam Jones Mum Dad Molly Rover Catty*
5 useful nouns: *boy girl dog cat ball.*   (See Download Files)
5 transport nouns: *plane car boat bus train.*
Taught separately first then put together in games & a book.
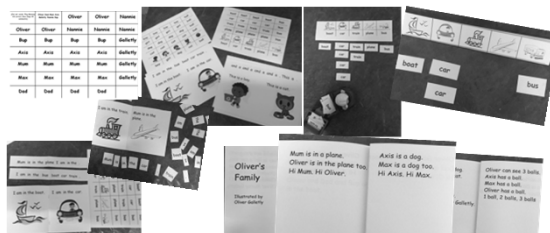
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Reduce confusion: Put similar items together so the child focuses on their distinctive features.

- If words are very different, kids sometimes don't notice them as deeply (e.g., thumbprint experiment).
- For similar words & letters, deeper 'reading' works well.
- Introduce confusing items singly to build initial awareness. Later, put them together so kids can learn from the fine distinctions which make them different
- Letters:
  - bdpq mw nhu
  - Sorting letters by sound at start/end/nowhere.
- Sight Words:
  - Own name: child finds his name from a collection of names with the letters in the wrong order (Oliver, Olver)
  - Strategically put similar words together:
    - of/for/from saw/was no/on.
    - My/my/am cat car can

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Reduce confusion: first separate, then, later, combine:
Keep similar words & letters apart initially, till one is known well. Later, when both are relatively well known, strategically put similar words & letters together.

- me/my/am
- cat/car/can
- of/for/from
- saw/was
- no/on
- b/d/p/q.
- m/n/h
- a/u, e/i.

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When ready, teach the 200 most frequent words.

- Teach regular/pattern/tricky words using phonics(Regular), analogy(Pattern) & whole-words (Tricky)
- Test kids' reading of 200 most frequent words (Download).
- Play Memory & Snap with sets of hard words (Download).
- Make sure you vary the words in the packs: if words are taught only in a small group, they'll start to be forgotten when you move to the next group.
- Include the target word and the error word in Rapid Reads and Memory/Snap, e.g, *me/my/am, saw/was, no/on, how/who, party/pretty/purple.*
- Monitor progress over time to ensure words aren't forgotten (See Newsletter 2).

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Pause a minute to reflect on maximising statistical learning

Effective learning depends on

1. How many **successful experiences** the child has +
2. How much **confusion** he experiences -
3. How high his **confidence** is about being able to learn +/-
4. How **actively engaged** he is in the learning +/-
5. His extent of Automisation Weakness - (Learning Breakdowns)

Effective teaching optimises these areas

**Effectiveness of Learning   =
Number of Successful Engaged Practices
- (Extent of Confusion +Confidence
      +Automisation Weakness)**

See Lit Plus Newsletter 2 article: *Maximise Statistical Learning*

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Appreciate the emotional burden of struggling readers: Acquired Helplessness & depression

- A few instances of low success reduces healthy readers' success expectations, effort & persistence (Hole & Crozier 2007
- In healthy learners, putting easy questions after hard ones results in low scores, frustration, & attributions of learned helplessness (Firmin et al., 2004).
- With short-term failure having strong effects, weak readers who experience ongoing low success often feel crushed.
- Acquired Helplessness is VERY common in weak readers - LH: not feeling capable of progress, seeing success as luck.
- Depression & low self-esteem are VERY common in weak readers: when the going gets tough, the depressed give up.
- Our kids live with anxiety & anxiety reduces processing capacity: ALAS for our kids needing high processing capacity

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Q: Why is it so hard for so many Aussie children to master reading & writing?

It's all about cognitive load vs cognitive processing

A: We're hit with a massive 'cognitive load crash' of the high cognitive load of learning to read against the low cognitive processing skills of young Aussies,especially those with major risk factors!

- English's complex orthography (26 letters, 44 sounds, >>560 spelling patterns) means learning to read words (a) has VERY high cognitive load and (b) makes massive demands on our children's processing skills.

- We start teaching reading when our kids are very young: 4.5-5yrs.
- Processing capacity is v. small then, esp. if kids are anxious.
- Overwhelmed kids 'give up' (feel incapable), making learning harder.

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Change, Challenge & Choice

1 **Challenge:** Let's meet the challenge of lowering cognitive load and demands for cognitive processing.

2 **Change:** Let's reflect on our options & make strategic changes in our teaching.

3 **Choice:** Let's choose best methods of lowering cognitive load, and optimising literacy development.

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Dr Galletly's SEPLA-CON Presentations:
Handouts for Sessions & Poster: www.susangalletly.com.au

1. Optimising Cognitive Load & Cognitive Processing for At-Risk & Struggling Readers   Monday 11.05-11.45am
2. Poster: The High Cost of Orthographic Disadvantage
3. Exploring Australia's Potential Towards Optimising Language, Learning and Life Outcomes Tuesday 2.20-3pm

Chat with Susan: Tuesday lunch: Poster.
  Other breaks: Pro-Ed Australia display

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