Phonics Implementation with People Who Need AAC: What Does the Evidence Base Say?

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Phonics

Currently, phonics instruction is dominating discussion of literacy instruction - governments, media, parents & professionals alike.

What does the research actually tell us?
What do we know about individuals who need AAC and phonics?

Let's Start by Talking about Neurotypical Students

SIMPLE VIEW OF READING

Decoding x Language Comprehension =
Reading Comprehension

Adapted from Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial & Special Education*, 7(1), 6-10. https://doi.org/10.1177/074193258600700104

The Simple View of Reading

- Most widely accepted model of reading at this stage
- Was developed with the idea of “ending the reading wars”
- Consists of two main areas - language comprehension and decoding
- The Simple View of Reading deliberately represents reading comprehension as an equation.
- Reading comprehension is a product of both language comprehension and decoding.

Phonics

Phonics is the area of instruction that teaches students to decode.

Decoding is one of the two components of reading (according to the Simple View of Reading).

Therefore, decoding is critical in early literacy instruction. (And so is language!)

What type of phonics instruction?

Some authors e.g. Wheldall et al., 2023, pp 133-137, state that systematic synthetic phonics is the most systematic and explicit form of phonics instruction.

Some authors e.g. Castles et al, 2018, state that analytic phonics instruction can be just as effective as long as it, too, is taught explicitly.

Overall, it is understood that synthetic phonics helps students to begin reading more quickly than analytic phonics and is preferred by many as a result.

Synthetic Phonics

Synthetic phonics takes the approach of educating children about letter sounds and combinations and how these sounds can be blended (synthesised) together to produce a complete word, hence the name ‘synthetic’.

Analytic Phonics

In analytic phonics, whole words are taught and then analysed to teach literacy learners about the parts of words. For example, the student might be asked to analyse a set of words to find out what they have in common e.g. big, bat, buy and bun, and then discuss which letter makes that common sound. Onset rime word families might also be used to teach a student that if they know how to spell one word in a word family e.g. man, then they can also spell other words e.g. fan, can, tan.

Australian Curriculum V9

Phonics

and phonemic awareness Included in the English curriculum for the first time

States

Are now moving towards explicit phonemic awareness and systematic synthetic phonics instruction; some are requiring it, with recommendations of 25 minutes per day and sometimes more.

Big 6

Recognised as a guideline for teaching literacy overall. Literacy instruction also needs to include explicit oral language, vocabulary, reading fluency and comprehension instruction.

The Literacy Hub

https://www.literacyhub.edu.au/.

National hub for literacy implementation

Currently mostly has resources for teaching synthetic phonics

Website includes a phonics progression for people developing their own programs

Also includes irregular words that need to be taught

Alphabetic Principle

The alphabetic principle is a critical skill that involves connecting letters with their sounds to read and write

The alphabetic principle has two parts:

1. Alphabetic understanding is knowing that words are made up of letters that represent the sounds of speech.
2. Phonological recoding is knowing how to translate the letters in printed words into the sounds they make to read and pronounce the words accurately.

Alphabetic Principle

The alphabetic principle is critical in reading and understanding the meaning of text.

In typical reading development, children learn to use the alphabetic principle fluently and automatically.

This allows them to focus their attention on understanding the meaning of the text, which is the primary purpose of reading.

Foundational Skills

Alphabet Knowledge

For neurotypical children, letter name knowledge has been determined as one of the foundational skills for developing the alphabetic principle. Without it, children learned a task in isolation but didn't transfer the skills being taught (see Byrne 2005 for a summary of this research)

Phonemic Awareness

Additionally, if children weren't able to segment phonemes, at least the initial phoneme, they also learned a task in isolation but didn't transfer.

When both phonemic awareness and letter name knowledge are in place, then acquisition of the alphabetic principle is triggered. These two skills, therefore, need to be in place before phonics instruction begins.

Learning from the UK Experience

- Synthetic phonics teaching first and foremost in literacy instruction for 12 years
- No evidence that this has made a significant difference to reading with comprehension for literacy learners
- "The most robust research evidence, from randomised control trials with longitudinal designs, shows that the approach to phonics and reading teaching in England is not sufficiently underpinned by research evidence." (Wyse and Bradbury, 2021).
- Wyse and Bradbury propose reading reconciliation and a recommendation for contextualised teaching of reading.
- "We call for an end to the reading wars and recommend an agenda for instruction and research in reading acquisition that is balanced, developmentally informed, and based on a deep understanding of how language and writing systems work."
  (Castles, Rastle & Nation, 2018).

Now let's talk about people who need AAC

People who need AAC & Phonemic Awareness

PA skills are highly variable – many children exhibit significant difficulties, however, some demonstrate skills commensurate with peers.

Potential influences:

- Task factors such as memory load, level of verbal cueing support (Larsson & Dahlgren Sandberg, 2008).
- Retrieval and quality of phonological representations (Sutherland & Gillon, 2008).
- Exposure to voice output (Larsson, Sandberg, & Smith, 2009).

Children who use AAC exhibit significant difficulty applying phonological knowledge to literacy tasks (Dahlgren Sandberg, Smith, & Larsson, 2010, p. 201).

Modified from Sally Clendon

People who need AAC & Phonemic Awareness Intervention

A number or studies including one systematic review (Barker, Saunders, & Brady, 2012).

Employed direct and explicit instruction and targeted a variety of phoneme awareness and early reading and spelling skills.

Concerns regarding skill generalisation.

- Future research needs to consider the interaction between PA skills and the quantity and quality of instruction (Dahlgren Sandberg et al., 2010; Smith et al 2009).
- PA needs to be part of a comprehensive literacy program. Skills should not be taught in isolation (Clendon & Gillon, 2008).
- Daily opportunities for writing are likely particularly critical for enabling application of this knowledge.

Modified from Sally Clendon

"Our Brains Don't Differ"

Actually - they do! (search for hyperconnected brain if needed)

And our life experiences with sounds do too.

How does an individual who uses AAC generate a word?
Do they generate words with incorrect sounds and get feedback?
What's the difference in generating a long word (e.g. elephant) and a short word (e.g. dog)

People who need AAC & Phonics Instruction

Single case studies and small group studies, no clear outcomes.

Suggestions that many phonics programs, particularly synthetic phonics programs, have too much cognitive load, including metalinguistics, for this group.

Some studies have a focus on adapting phonics programs for people who need AAC and who have intellectual disability. One systematic review (Yorke et al, 2021) found good outcomes from adapted programs.

Adapted programs generally don't require students to talk and also reduce the number of rules/amount of metalinguistics and handwriting

People with Intellectual Disability & Phonics Instruction

Small group and single case studies again

Dessemontet et al (2019) metanalysis showed no difference in outcomes between synthetic phonics and analytic phonics approaches as long as they were taught explicitly

We don't have information about which is "faster" as we do with neurotypical students

Autistic Literacy Learners & Phonics Instruction

Research into phonics instruction and autistic people is nearly all with verbal individuals

Slowly starting to see some small group studies or case studies with autistic people who need AAC

Statements from the autism research and/or community:

- Some autistic people figure out the alphabetic code with no instruction
- Synthetic phonics isn't appropriate for some hyperlexic autistic people as they can already read and write all the words included in phonics instruction e.g. SATPIN, can already read/wrote at, sat, pat, etc.
- Suggestion analytic phonics is more appropriate for some

Autistic Literacy Learners: Literacy Profile

Reading skill profiles vary widely across all literacy learners, including autistic individuals.

However, a common pattern in autistic literacy learners is a relative strength in decoding, combined with weak comprehension skills.

This profile frequently begins emerging in the preschool years (strong alphabet knowledge and poor language comprehension).

Although the reading development of autistic individuals is highly variable, most school-age learners with ASD will struggle to understand what they read (Brown et al., 2013; Grimm et al., 2018; McIntyre et al., 2018; McIntyre, Solari, Gonzales, et al., 2017; McIntyre, Solari, Grimm, et al., 2017; Nation et al., 2006; Ricketts et al., 2013)."

Phonics Instruction and the Brain

Working Memory:

- Is made up of a central executive system, which is responsible for control over actions as well as processing of linguistic and visuo-spatial information (Baddeley, 2000).
- Impacts on academic achievement, including literacy (Alloway & Alloway, 2010).
- Has an impact on language skill development, and is required in mastering new information and moving it to storage (Shvartzman & Shaul, 2023)
- Is the space where thinking happens and is a limiting factor to long-term memory (Lovell, 2020)
- Enables phoneme-grapheme association and storage in long term memory. Impact on working memory will affect transference to long term memory and recall (de Souza Cardoso et al 2013).
- Danielsson et al (2015) metanalysis also found types of disabilities can play a role in how the working memory and short term memory can be impacted.

Working Memory with AAC

While holding onto a message or thought, person must:

- Navigate through their system
- Remember the most efficient way to get there
- Locate the target symbol on that page and,
- Not get distracted

(Thistle and Wilkinson, 2013)

And constantly prove to others that they can while having their messages questioned and doubted!

Working Memory in Application

When learning new information, more working memory is used than when recalling familiar information (Lovell, 2020).

Learning a letter involves chunking the information and, through repetition, moving it into long-term memory, so it can be recalled later with automaticity.

Working memory is what we use to hold onto thoughts and ideas when composing a text. It will help to sequence sounds into words while spelling.

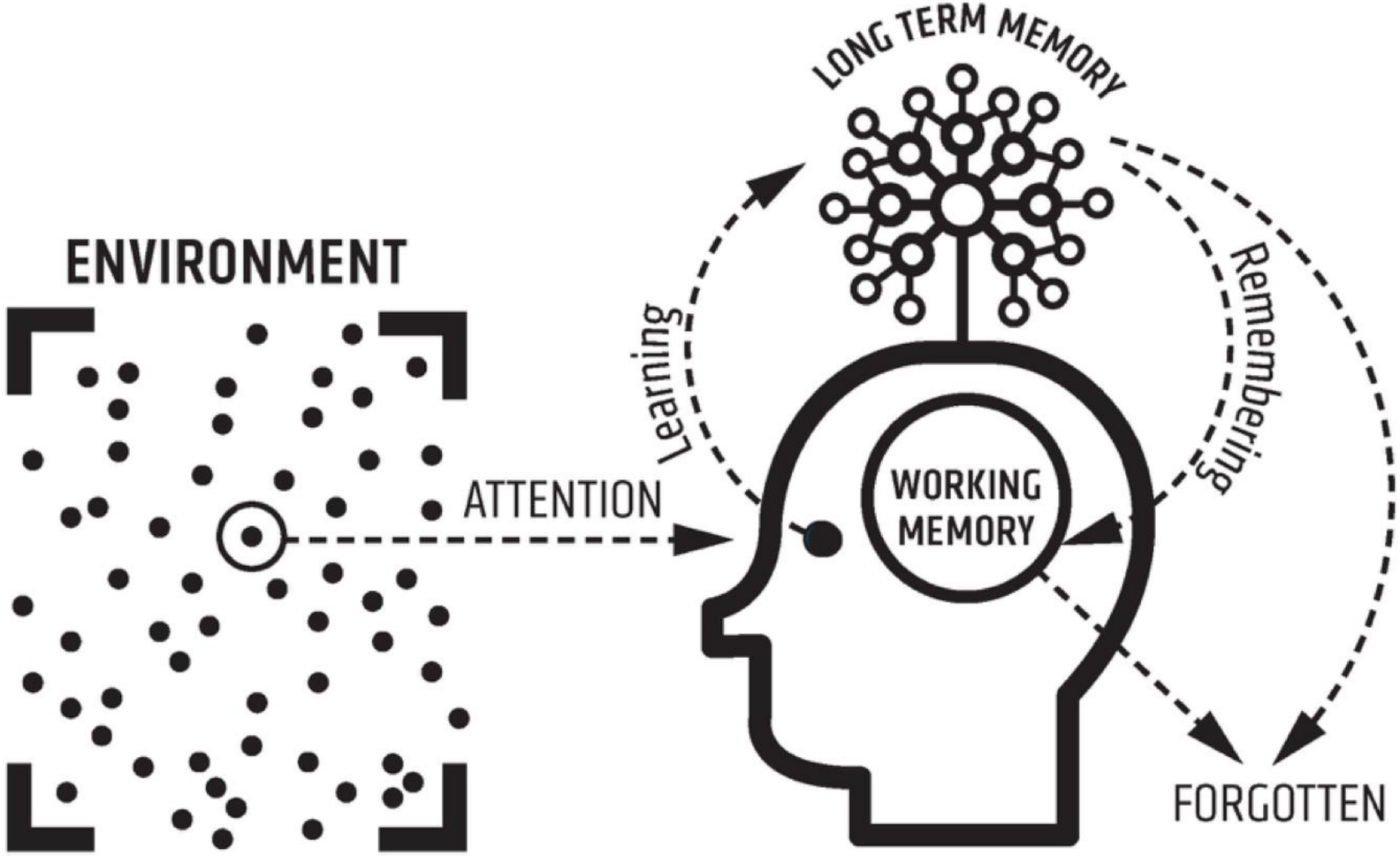
Phonological processing in working memory allows for the detection and manipulation of phonemes in oral language (Gupta & Sharma, 2017)

Cognitive Load Theory

Refers to the limiting factors that all people have to take in new information and store it in long term memory. When we are overwhelmed learning doesn't occur (Kennedy, 2021).

Cognitive Load Theory finds we are limited to learning four to seven pieces of new information. For people with moderate to severe intellectually disabilities, this is reduced to one piece of information.

Two components play significant roles on cognitive load and what is learnt: extrinsic and intrinsic information (Lovell, 2020).



https://teacherhead.com/2020/03/10/a-model-for-the-learning-process-and-why-it-helps-to-have-one/

Cognitive Load in Phonics Instruction

An approach that:

“is focused on letter-sound co-relation while reading with comprehension, as intrinsic cognitive load, while removing parts of instruction that serve only to add extraneous cognitive load, is critical for all literacy learners”
(Lovell, 2020).

Explicit Synthetic Phonics instruction looks like, what?

Explicit Synthetic Phonics Instruction

Explain	We had a look yesterday at a new digraph. The digraph was /ai/, /ai/ represents the phoneme /ā/ in the middle of a word and our key word is "rain". (Teacher writes the word rain on the board)
Model. Guide with maximal scaffolding.	Read this word with me, "rain". Good job. What are the sounds? You finger stretch and say the sounds while I move a counter into each box: /r / /ai/ /n/. (Teacher moves counters into 3 boxes as students say each sound)
Model	Teacher points to the word "rain" on the board. "Look at the word rain. How many letters are there? (4). How many sound boxes did we use? (3)
Explain	Since there are four letters and three sounds, we know that two of our letters make up a digraph. The digraph is /ai/ and it represents the sound /ā/ in the middle of a word. Remember, a digraph is two letters that work together to make a single sound.
Model and guide with maximal scaffolding	Another word with the digraph /ai/ is pain. Let's all write the letters for pain. What's the first sound? (/p/) What letters spells /p/? (p) What's the second sound? (/ai/) That's our digraph - remember that's two letters working together to make the one sound. Which two letters spell /ā/? (ai) What's the last sound? (/n/). What letter spells /n/? (n)
Teach first - then ask (review information just presented)	Let's have a look at the sounds again. For the word rain, we only had three sounds, but we have four letters. Let's talk about the word pain. I've got my sound boxes here. The first letter in pain is /p/. It goes in the first sound box. The second letter is /a/. It goes in the second sound box. The third letter is /i/. Does it go in its own sound box? (No). Why not? (Because it works with a to make the one sound) The fourth letter is /n/. It goes in the third sound box. So, pain, like rain, has four letters but only makes three sounds.

Some examples of teacher language from a synthetic phonics lesson

Example 1

“We're going to remember the definition of a phoneme, so a phoneme is a single sound in a word can you say that with me? A phoneme is a single sound in a word- good job.”

Example 2

“A grapheme is when we write so a grapheme is a letter or group of letters that represent a single sound. Can you say that one with me? A grapheme is a letter or group of letters that represent a single sound- good job. “

Example 3

So the types of phonemes that we're focusing on at the moment are vowels so let's see if we can remember. We have long vowels where we go nice and tall and we have short vowels that are little and short so our long vowels are /ā/ /ē/ /ī/ /ō/ /ū/ can we say them together /ā/ /ē/ /ī/ /ō/ /ū/ - good job.
Now let's remember our short vowel sounds /ă/ /ĕ/ /ĭ/ /ŏ/ /ŭ/ let's say them together /ă/ /ĕ/ /ĭ/ /ŏ/ /ŭ/ -good job.

What are the difficulties with this for the students we work with?

We need an approach that:

- Does not require students to pronounce individual letters, sounds, name or words
- Introduces needed vocabulary without adding too much cognitive load i.e. minimises metalinguistics
- Use their mouth to talk
- Reduces load in other ways e.g. no handwriting, reducing the number of letters they are juggling

An approach that meets these guidelines:

- Isn't currently commercially available (that we know of)
- We do have a phonics approach, Making Words, which follows these parameters and which has been shown repeatedly to work with people who need AAC and people who have intellectual disability
- However, Making Words doesn't meet some of the guidelines for synthetic phonics instruction e.g. two vowels per lesson.

What We Can Say...

Phonics

No clear evidence that synthetic phonics is (or isn't) the best option for people who need AAC

Synthetic Phonics

Most commercially available explicit synthetic phonics programs will need modifying for people who need AAC

Analytic Phonics

May be a better option for some of the students we work with as long as it is taught explicitly

The Big Six

Make sure you cover all areas of The Big Six as the language areas often require a lot of intervention for the students we work with

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