Research, Resources and Reflections

Contents

EDITORIAL

After a successful conference last month this edition of the Bulletin offers more detailed information and articles from the presenters.

I am passionate about embracing robust evidence to support practice and the conference echoes this theme with presenters sharing their research approaches and findings to inform and explore teaching and interventions across the age ranges.

Tribute is also paid to Sir Jim Rose who worked tirelessly to link research to practice. Further information about his long career can be found on page 2

Dr Jessie Ricketts has generously shared valuable research evidence which questions traditional assumptions about the nature and timing of reading development and has shifted the focus from primary education into secondary education. The article contains links which expand on the direction and outcomes of her research and practice and provide a valuable resource for practitioners.

The crucial role of orthography and the impact of orthographic processing difficulties is explored by Dr Nancy Mather and Dr Sharon McMurray. The terminology associated with orthography may sometimes appear bewildering and can lead to misunderstandings and misperceptions. Both articles provide useful insights and clarification of the variables and intricacies of this subject, questioning traditional approaches and again provide links to practice.

Self regulated learning may be broken down into three key elements: cognition, the process involved in knowing and understanding, metacognition, the learning to learn and motivation, the engagement with learning. Learning how to learn is a crucial skill and Professor Reynolds' article highlights the importance of direct teaching of these skills. Some learners are fortunate enough to 'pick up' these skills but others will benefit from direct and explicit instruction. My recent experiences with learners in higher education support these findings with so many learners remarking 'I wish I had been taught how to learn earlier'.

Other articles in this edition cover aspects of assessment from the role of diagnostic labels to practical tools such as the use of the DASH 17+ for assessing writing skills and the Dynamic Assessment of Reading Test (DART) project.

In addition to the book reviews a new section which reviews Apps and software has been added. We hope readers will find this a useful addition.

I am grateful to all the authors who have given so willingly of their time in sharing their expertise and experiences and to the editorial team who have provided valuable insights and contributions to bring you this edition.

Contributions are always welcome. If you have found any apps particularly useful, please think about sharing your experiences. Guidelines for article submissions may be found on page 107.

I hope you have a restful holiday and return refreshed for the new year and the commitment to lifelong learning for all.

Julia Kender

Editor in Chief May 2023

A Tribute to Sir Jim Rose

We dedicated the 2023 annual conference to Sir Jim Rose who passed away in March of this year.

His work has led to significant improvements in the teaching of early reading and the continuing campaign to get the right support for those struggling with literacy. He was a strong proponent of research underpinning practice which speaks so clearly to this 2023 Annual Conference theme: 'Bringing Current Research into Practice'.

At the request of the Secretary of State for Education, Jim led several independent reviews including a Review of the Teaching of Early Reading (2006) [as noted in Jim's Guardian obituary https://www. theguardian.com/education/2023/mar/03/sir-jim-rose-obituary]. 'As chief inspector for primary education, he was commissioned along with Professor Robin Alexander, then of Leeds University, and Chris Woodhead, then head of the National Curriculum Council, to draw on evidence from research and inspection. They laid down themes that still resonate today, placing quality teaching at the centre of school improvement'.

Their 'Independent Review of the Teaching of Early Reading' led to the widespread introduction of phonics in the primary curriculum. His continuing work centred around the 'simple view of reading', stressing the two important dimensions of reading - 'word recognition' and 'language comprehension'. This method has underpinned developing approaches to tackling reading.

In 2008 there followed the Review of the Primary Curriculum and in 2009 a review of the Identifying and Teaching Students with Dyslexia and other Learning Difficulties. The latter led to the government's

committing £10 million to training specialist dyslexia teachers and the recommendation that every school have access to a specialist dyslexia teacher. At the Dyslexia-SpLD Trust we facilitated the training these funds supported. I was fortunate to work with Jim when he was Chair of the Dyslexia-SpLD Trust. He was also president of the National Foundation for Education Research.

Even in retirement Sir Jim was constantly examining and sharing articles and research he found of interest, keeping his passion for developing reading very much to the fore.

Anyone who worked with him will have gained so much from knowing him. It was a privilege to work with him. He was truly inspirational in his dedication.

Lynn Greenwold

Reading in adolescence: What do we know and what can we do?

Ricketts. J.

Abstract

There is a widespread assumption that children can read when they leave primary education and a tendency to consider the teaching of basic reading skills to be beyond the scope of secondary school. In working closely with schools however, I have discovered that secondary practitioners see reading as a huge challenge. They have expressed concerns about the level of need: that there were many students who did not have the reading skills that they needed to access the curriculum and that this group isn't limited to students with identified special educational needs. Indeed, international assessments indicate that nearly 20% of adolescents are not able to read simple texts accurately and with understanding (Jerrim & Shure, 2016). Secondary staff also say that they did not feel that they have the knowledge, capacity or resources to support these children. Though historically most research has focused on reading in children, evidence on reading in adolescence is emerging and is starting to filter into practical approaches and policy making, as exemplified by the Education Endowment Foundation Secondary Literacy Guidance (https://bit.ly/EEF_secondary_literacy) and recent Ofsted report (https://bit.ly/Tes_Ricketts_ofsted).

Key Words: adolescence, reading development, reading motivation, reading and vocabulary, curriculum access, transition, interventions

Introduction

I am thrilled to have been asked to give a keynote presentation for the 2023 PATOSS conference. I decided to cover three main points that illustrate what we know about reading in adolescence, and what we can do to address the challenges that this reveals. The first point covers what we know about reading development in adolescence. The second emphasises the importance of spoken language for reading in adolescence and how reading provides opportunities for language learning too. The third and final focus is on collaborative work that provides important messages about how to support reading in adolescence.

What do we know? Reading development in adolescence

Research has focused on reading in childhood and adulthood, neglecting the intervening adolescent period. Two of our longitudinal studies address this gap. The Vocabulary and Reading in Secondary School

(VaRiSS) study was led by myself and Dr Nicola Dawson at Royal Holloway, University of London and tracked reading development in Key Stage 3, from age 11 to 14 years. We worked with approximately 200 students, who completed reading assessments every year. This research is summarised in Ricketts et al. (2020).

The Reading and Vocabulary (RAV) study was led by Dr Laura Shapiro, Dr Sanne van der Kleij (Aston University) and myself exploring reading from Year 5 to Year 8 (age 9 to 13 years), as students transition from the primary to secondary school setting. Again, we measured reading, but this time we focused on leisure reading activity as well as reading proficiency. This work is summarised in van der Kleij et al. (2022; 2023).

Across the two longitudinal studies we sought to understand the following:

1. What does reading development look like in adolescence?
2. How is reading development linked to socio-economic status (SES)?
3. Does reading show a primary-secondary transition 'slump'?

We observed progress in reading in early adolescence (age 10 to 14 years), though this is less marked than earlier in development. Progress over the transition from primary school does not show a 'slump', instead mimicking progress over any other summer holiday. However, the challenges faced in secondary are different from primary, with increasingly complex language being used and greater expectation that students will read independently (Deignan et al., 2022). A substantial minority of students show low ability that will impede access to the curriculum. Furthermore, lower SES students show less successful reading comprehension than higher SES students, though this SES difference is not observed for word reading. Notably, reading abilities are also extremely varied and it will be challenging for teachers to ensure that all adolescents can access the curriculum.

Our findings have clear implications for secondary education. First, we cannot assume that students have the reading proficiency needed to access the school curriculum and complete school assessments and exams. Consequently, there is a need for evidence-based support and interventions that are effective in secondary school. Importantly, such approaches also need to be feasible in that context, and acceptable to the students and staff involved. Second, observations of wide variability mean that teachers in all classrooms face a real challenge in supporting learning for students with such wide-ranging reading abilities. This variability alongside small (but significant) progress also means that the range of reading proficiency in Years 5 – 9 is overlapping to a great extent. Thus, the knowledge and skills that these

students bring to the curriculum is similar across these phases of education. Clearly, however, the challenge of the curriculum increases dramatically over those years suggesting an increasing gap between proficiency and challenge.

What do we know? Linking reading and vocabulary in adolescence

Research clearly shows the link between written and spoken language processing. In our research we have focused on one aspect of spoken language: vocabulary. Of course, other aspects of spoken language are also important for reading, like phonology (knowledge of sounds), morphology (e.g. prefixes and suffixes) and syntax (word order). Our two longitudinal studies tracked the development of vocabulary as well as reading, and explored the links between reading and vocabulary (Ricketts et al., 2020; van der Kleij et al., 2022).

We focused on vocabulary because it provides a core knowledge base for word reading and reading comprehension. We conceptualise vocabulary knowledge as stored information about phonology, orthography (visual word forms) and semantics (meaning) that is closely bonded together such that hearing a word (phonology) brings to mind the written form and meaning, and reading a word brings to mind its spoken form and meaning (Perfetti & Hart, 2002). So vocabulary knowledge underpins word reading. Vocabulary knowledge is also important for reading comprehension (Hogan et al., 2011). Knowing the meanings of the individual words in a text is the starting point for building the mental representation of a text that is needed for successful comprehension.

Our longitudinal research addressed the hypothesis that vocabulary knowledge is *causally* implicated in the development of reading, with good vocabulary knowledge promoting reading development and lower vocabulary placing constraints of reading development. When there is an association between two variables, longitudinal research allows us to specify the direction of the relationship. Our findings provided clear evidence of close links between reading and vocabulary knowledge in adolescence, with vocabulary knowledge underpinning successful reading (Ricketts et al., 2020; van der Kleij et al., 2022). Therefore, if a student is identified with reading needs, it is worth checking for any vocabulary (as well as other language) needs as well as this might be a good target for intervention. In addition, when setting texts to read it is important to be mindful of any words contained within those texts that students might not know. Sometimes it is easy to predict which words are likely to be unknown (e.g. technical terms like photosynthesis) but students may also lack knowledge of words that are well known by teachers and other adults (e.g. analyse).

Importantly, reading also provides important opportunities for students to grow their vocabulary knowledge. Indeed, some words do not really occur in everyday spoken language and are mainly encountered whilst reading (Nation et al., 2022). We were interested to find out how reading proficiency, vocabulary knowledge and reading behaviour were linked (van der Kleij et al., 2022). Our findings indicate that reading ability is linked to vocabulary directly and indirectly via reading amount. In other words, this suggests that being a better reader drives vocabulary directly, but also, better readers read more, and reading more increases vocabulary. We also concluded that if we want to support students to enter a virtuous circle where reading proficiency feeds into more leisure reading and vice versa, we need to pay attention to reading proficiency first. Without a minimum level of proficiency, students will not be able to enjoy texts and learn from them in the first place. Once some proficiency is in place, then a joint focus on promoting proficiency and reading behaviour is important and this should foster vocabulary, as well as reading.

Adolescent reading development: What are the messages for education?

- We cannot assume that students have the reading proficiency needed at secondary school so there is a need for evidence-based support and interventions that are effective, feasible and acceptable in this context;

- Reading proficiency is extremely variable in secondary students, which presents a significant challenge for teachers;

- The range of reading proficiency in Years 5 – 9 is largely overlapping and yet students are faced with increasing challenge from the curriculum;

- Word reading and reading comprehension needs may stem from vocabulary challenges so intervention may need to target vocabulary needs, as well as reading need;

- Teaching and learning activities often require some independent learning. In these situations it is important to be mindful of any words contained within those texts that students might not know;

- Promoting reading proficiency and volitional reading are both important goals, yet for low proficiency readers proficiency should be addressed first, to allow students to access, enjoy and learn from texts;

- Promoting reading proficiency and volitional reading can benefit vocabulary knowledge, as well as reading.

What can we do?

My final point concerns what to do. Evidence-based practices and programmes for adolescents are lacking and we cannot assume that what works with younger children will work with this age group. Nonetheless, collaborative work with educational practitioners has enabled us to make some progress here and is essential if we are to understand what is going to be effective, feasible and acceptable in the secondary school context. My keynote focused on three projects: the Blackpool Key Stage 3 Literacy Project, the Reading and Vocabulary experiment and the Love to Read Project.

The Blackpool Key Stage 3 Literacy Project was led by the Right to Succeed charity and was a collaboration between the nine settings that provide secondary education in the town, comprising six mainstream secondary schools, two mainstream all-through (primary and secondary) schools, and the pupil referral unit (alternative provision for students not in mainstream school). I acted as a critical friend in the team, bringing expertise in conducting research on language and literacy in children and adolescents. Our research-practice partnership led to the development of a 'decision tree' tool for identifying reading needs with precision and aligning those needs to targeted support and interventions. We then worked together to consider how schools can evaluate the impact of their practices using a tiered approach and considering impact for the students, the school and teachers. This work is summarised in an article that I co-authored with a teacher and a representative from the Right to Succeed charity (Ricketts et al., 2022). We are now working with other schools to explore how the decision tree could be applied to other regions and in primary as well as secondary school.

The Reading and Vocabulary Project involved collecting longitudinal data as described above. However, we also conducted an experimental study (van der Kleij et al., in prep). The combination of longitudinal and experimental methods provides a gold standard test of a causal hypothesis. In our case, we tested whether leisure reading *drives* vocabulary learning. For this experiment, we had two aims, to encourage secondary students to read more in their free time, and to see whether this reading led to more vocabulary knowledge. We adapted an approach from the healthy eating literature (Pedersen et al., 2016) and asked students to fill in a daily diary for 10 weeks recording what they had read. They also set reading goals and received feedback on these goals. We worked closely with Oxford University Press, identifying four of their books for the project and sending copies of these books to participating schools so that students could borrow them. Whilst we did see a link between amount of reading and vocabulary learning, this study was not entirely successful in increasing reading amount and we anticipate that our next steps here will emphasise involving young people more actively in the research process.

The Love to Read project was led by Sarah McGeown and Emily Oxley at Edinburgh University, with Dr Laura Shapiro (Aston University) and I. The goal of this project was to work with children and teachers to co-produce a reading motivation programme for use in primary schools (McGeown et al., 2023). We identified six principles that are linked to reading motivation, along with activities to promote these principles in the classroom. The six principles are: access, choice, time, connection, social, success. We suspect that the programme will not translate directly to the secondary setting but hope that this programme will provide insights for future work in the secondary context.

Conclusion

In summary, we are building a clearer picture of adolescent reading development through robust longitudinal and experimental research that involves working with educational practitioners and young people. We hope to uncover effective, feasible and acceptable approaches that enable our young people to be successful readers who read regularly and with enjoyment.

References to our research with links

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Links

Language and Reading Acquisition (LARA) Research Group:

https://lara.psychologyresearch.co.uk

Blackpool Key Stage 3 Literacy Project:

https://righttosucceed.org.uk/working-collectively/key-stage-3-literacy-project/

Reading and Vocabulary Project:

https://bit.ly/AstonLiteracyProjectTeam

The Love to Read Project:

https://blogs.ed.ac.uk/lovetoread/

Education Endowment Foundation Secondary Literacy Guidance: https://bit.ly/EEF_secondary_literacy

Ofsted secondary reading report and my response:

https://bit.ly/Ofsted_secondary_reading

https://bit.ly/Tes_Ricketts_ofsted

Professor Jessie Ricketts is based in the Department of Psychology, Royal Holloway, University of London and directs the Language and Reading Acquisition (LARA) research group. Jessie researches language and literacy in children, young people and adults. She is particularly interested in how reading benefits children's learning and language. For example, how does learning to read change the way that we process language? Should we emphasise written forms when teaching children new words? How can we support adolescents to read more so that they can expand their vocabulary knowledge? Jessie works closely with teachers, educational charities and policy makers to conduct research and consider its implications for education.

Orthographic Knowledge Is Essential for Reading and Spelling

by Nancy Mather and Lynne Jaffe

Abstract

The purpose of this article is to explain orthography and discuss how difficulties mastering English orthography can impact both reading and spelling development. Confusion exists regarding the differences in meaning of terms associated with orthography. We begin this article by explaining terminology related to orthography and then describing how the process of sight word reading develops. Next, we explain how orthographic knowledge is related to dyslexia and how weaknesses in orthography differ from weaknesses in phonology, and why it is so difficult for some children to acquire this knowledge. Student writing samples are integrated to illustrate problems in the mastery of orthography. Although some uncertainty still exists regarding the best ways to intervene with students who have weaknesses in orthographic processing and knowledge, initial instruction in reading and spelling should focus on helping students develop phoneme-grapheme correspondences along with instruction in both phonemic blending and segmentation skills needed for orthographic mapping. Difficulty developing reading and spelling skills involves more than just phonological awareness. Reading and spelling do involve the eyes.

Keywords: orthography, orthographic knowledge, orthographic processing, orthographic mapping orthographic image, sight word

Glossary:

orthography: the writing system of a language, including spelling, punctuation, and capitalization rules

orthographic knowledge: information stored in memory regarding how to represent spoken language as written language

orthographic processing: how the brain acquires orthographic knowledge

orthographic mapping: the process of associating speech sounds with written letters (phoneme-grapheme mapping)

orthographic image: a stored mental image of a letter, spelling pattern, or word

sight word: a word that is instantly recognized

One important aspect of structured literacy is helping students to develop an understanding of the orthography of a language. Unfortunately, little attention has been paid to the importance of orthographic processing. In addition to phonological awareness, another important linguistic risk factor for dyslexia is orthographic processing. The purpose of this article is to explain how orthographic processing impacts children's development of word reading and spelling. Often even skilled evaluators are puzzled when they encounter such a case.

For example, a colleague recently assessed Samantha, a young girl (age 9 years, 11 months), and was puzzled by her test results. She described them in the following way: "On the GORT-4 (Gray Oral Reading Test-4, scaled scores, mean = 10, standard deviation = 3), she scored 10 on Reading Rate, 13 on Accuracy, and 14 on Reading Comprehension. Her performance on an untimed phonological awareness task was good, and her Full Scale IQ score of 130 places her in the gifted range. She had no difficulty reading nonsense words on an untimed task (85th percentile) and was in the average range (46th percentile) when reading a list of irregular words, although she had no difficulty with those same words in context. In fact, she seems to be a beautiful reader. Her only problem is spelling. She makes numerous spelling mistakes, even on simple words, such as spelling *very* as *vry*, *only* as *onle*, and *they* as *thay*. Within a paragraph, she often spells the same word three different ways." Our colleague's question to us was, "Why is this happening? Could this be dyslexia? Her written stories are absolutely amazing, but her spelling is truly awful."

Although dysgraphia may be a more accurate descriptor than dyslexia because her difficulties are with writing, not reading, our first thought was that this is a bright girl who demonstrates a disparity between the level of orthographic knowledge needed for reading and the level of orthographic knowledge needed for spelling. Reading, particularly for irregular words that cannot be easily sounded out, requires that a student have enough familiarity with the orthographic sequence (i.e., letter sequence) to recognize a word as familiar. Spelling, however, requires a much more rigorously established memory of the sequence of letters in a word, because it requires the student to recall the sequence in its entirety. Reading requires orthographic *recognition,* while spelling requires orthographic *recall* and application. This distinction is the likely reason why most adults can easily read words like *licorice, license, colonel, hors d'oeuvres,* and *rendezvous,* yet have difficulty spelling them accurately (see Kilpatrick, 2015, p. 83).

What Do the Terms Orthography, Orthographic Processing, and Orthographic Knowledge Mean?

Confusion exists regarding the meaning of various terms associated with orthographic knowledge (Apel, 2011). In the broadest sense, orthography refers to the conventions of the writing system of a language. It is defined as "the system of marks that make up a printed language. For the English language, orthography includes upper and lowercase letters, numerals, and punctuation marks" (Wagner & Barker, 1994, p. 245). Orthographic processing is the function through which the brain acquires orthographic knowledge. It includes forming, storing, and accurately and rapidly retrieving (a) individual letters, (b) letter sequences that make up common spelling patterns (e.g., –et, –im, –ight, –ould), and (c) letter sequences that make up whole words (Cunningham et al., 2011; Ehri, 2005). Orthographic knowledge is the information stored in memory regarding how to represent spoken language as written language, including the visual representations of specific words, commonly occurring combinations of letters, and the rules of a language regarding how speech is represented in writing (Apel, 2011; Georgiou et al., 2021).

> *Spelling, however, requires a much more rigorously established memory of the sequence of letters in a word, because it requires the student to recall the sequence in its entirety. Reading requires orthographic recognition, while spelling requires orthographic recall and application.*

Orthographic Mapping and the Development of Sight Word Reading

Orthographic mapping is the cognitive process by which readers associate speech sounds with written letters (phoneme-grapheme associations) in a written word to store it for immediate retrieval "on sight." New readers learn sound-symbol associations and begin to sound out words by retrieving the sound of each letter, left to right, and then blending the sounds into a word. Typically, after a beginning reader has sounded out the same word several times, its letter patterns are mapped to its sounds, and the word becomes stored in long-term memory with its sound and meaning. This now familiar word becomes a "sight word." Unfortunately, the term sight word is often used in three different ways in schools:

• high frequency words (e.g., it, the, said, she)

• phonetically irregular words (e.g., was, bouquet)

• orthographically mapped, or instantly recognized words (i.e., a student's sight word vocabulary)

These uses represent three different concepts—frequency in print, phonetic irregularity, and familiarity. Using the same term for three different concepts promotes confusion.

Researchers in the area of orthographic learning, however, use it in only one way: a *sight word* is a word that has been previously encountered, typically multiple times, and learned to the point that it becomes instantly recognized. This is true regardless of whether the word is frequent or infrequent, or phonetically regular or irregular. A pool of sight words is referred to as an individual's *sight word vocabulary* or *orthographic lexicon*. The point here is that a word's letter sequence must get "mapped" onto its sounds and meaning in long-term memory (Ehri, 2007, 2014). Subsequently, when the word is encountered in text, the reader recognizes it, triggering both its pronunciation and meaning (Share, 1995).

Ehri's Orthographic Mapping Theory

One prominent theory that explains how skilled readers acquire the tens of thousands of words that are instantly recognized is Ehri's *orthographic mapping theory* (Ehri, 2007). In this developmental sequence, phonemic awareness is the necessary foundation on which orthographic memory is built (Miles & Ehri, 2019). As young readers use phonemic awareness and phonic decoding skills to sound out words, they pass through overlapping phases of sight word development. Before mastering alphabetic knowledge, beginning readers form associations between visual cues and spoken words but are unaware of letter-sound associations (e.g., they recognize the *M* for McDonald's). They first note an association between the most prominent sounds in a word and the representative letters, then progress to sounding out a word letter by letter, and finally they say the word. After sounding out a given word several times, its letter sequence becomes bonded with the sounds in the spoken word as well as its meaning in memory. Also, with more reading experience, readers recognize common letter patterns in words, such as digraphs, diphthongs, and morphemes (e.g., *th, ou, tion*), which are then stored in memory along with their sounds. As readers master more and more orthographic patterns in printed words, their sight vocabularies grow exponentially (Ehri, 2005, 2007, 2014; Kilpatrick, 2015, 2020). Quick access to these orthographic representations in memory then facilitates fluent reading and comprehension (Cunningham et al., 2011)

Dyslexia in Relation to Phonological and Orthographic Weaknesses

Readers with dyslexia typically have difficulty with some or all of the following abilities: developing phonemic awareness, establishing stable phoneme-grapheme associations, and developing accurate and fast recognition of words. Consequently, these readers do not develop a strong phonics foundation on which to map letter sequences and word parts, slowing the development of a sight vocabulary. The reader often guesses at words when reading and overrelies on context clues to identify words. Recent research suggests that children with dyslexia are as likely to have difficulties in orthographic knowledge as in phonological awareness and rapid automatized naming (Georgiou et al., 2021).

Typical readers with accurate and efficient phonemic awareness and phonic decoding ability automatically create orthographic images of decoded words in memory. Readers with a weakness in the ability to process orthographic information are less likely to perceive the orthographic pattern initially; thus, no stable memory for the letter sequence is established. Subsequently, when they see a word, even if they have seen it multiple times before, that word does not register as familiar or activate its pronunciation. Consequently, they depend on sounding out words for identification, acquire sight words more slowly, read less fluently, and spell words phonetically.

> *Once a word has been retrieved and spelled, a writer may examine it to see if it "looks right." While this may seem like a visual memory task, it more likely involves determining if the sequence gets a "direct hit" in the orthographic lexicon.*

Some students, however, especially those with strong oral language, are good readers but poor spellers, because they form only partial orthographic representations in memory. This is likely because, as stated above, a more firmly established orthographic image is required for spelling than for reading. In addition, readers with strong oral language abilities are supported by passage context and vocabulary knowledge when reading, which helps them to identify words that are not well established in orthographic memory. This support is not available while spelling. Accurate spelling requires retrieval of each letter or letter combination in the correct sequence. Once a word has been retrieved and spelled, a writer may examine it to see if it "looks right." While this may seem like a visual memory task, it more likely involves determining if the sequence gets a "direct hit" in the orthographic lexicon. For example, both *train* and *trane* are accurate spellings phonetically, but only *train* is spelled correctly. *Train* may be sufficiently established in orthographic memory to read it correctly, but not to spell it reliably. Thus, when checking if it looks right, *train* may get a direct hit, while *trane* finds no entry in the orthographic memory system, which is why it doesn't look right. When a reader who has a limited sight word vocabulary is asked which word looks right, the response is likely to be, "Words never look right to me" (Willows & Terepocki, 1993, p. 35).

Types of Orthographic Errors in Reading and Spelling

In the past, certain types of errors have been described as associated with a weakness in orthographic knowledge.

In **reading**, these include:

- difficulty learning and remembering words with an irregular element
- continuing to sound out words after many exposures
- over-relying on context for word recognition
- confusion of little words that share some letters (e.g., *of/for*) and similar looking letters and words (e.g., *b*/*d*, *on*/*no*)
- slow word perception and reading rate

In **spelling**, the types of errors include:

- representing all or most of the phonemes in the correct sequence, but with incorrect graphemes
- reversing certain letters (e.g., b and d) and transposing little words (e.g., saw and was)
- spelling common high frequency words as they sound (e.g., spelling they as thay)
- regularizing the irregular element of exception words (e.g., spelling said as sed)
- spelling the same word inconsistently
- violating rules of English spelling by creating illegal letter strings (e.g., spelling watch as wacth)

Adapted from Willows, 1991, p. 170

As children develop in reading, they acquire an implicit knowledge of permissible letter sequences (Hultquist, 1997). This knowledge, however, does not evolve as quickly in readers with weaknesses in orthographic processing.

Case Examples

It is often easier to understand students' difficulties by looking at examples of their writing and spelling rather than analyzing their reading errors. The following three cases illustrate the writing of students with weaknesses in orthographic processing.

Spence: Below is a writing sample with a translation from Spence, a fifth-grade student who reads several years above his grade level. Although there is some evidence of phonemic processing errors (e.g., omitting sounds, vowel confusions), there are also many orthographic errors.

Within the last two lines, he has spelled the word *again* four different ways with each being a fairly accurate phonetic spelling. In his title, he spells the word *beams* as *beems*, but then near the end, he spells it as *dens.* He reverses the letter *b* in the words *beams* and *behind* and breaks the word *because* into two words. On the first line, he has slowly and carefully sounded out *night*, capturing the long *e* sound before the *t*. One interesting fact was that after Spence finally learned how to spell the word *police*, the police appeared in every story he wrote.

High Beams

One dark night
a lady left the
university. She got into
her van and started home.
When the lady got home
she called the police
because the man behind
turned on his high beams
again and again
again and again…

In the next excerpted writing sample describing the planets, Spence wrote several words with a reversed letter *j.* In the second line, he spelled the word *made* as *mabe* and then the word *maybe* as *mabe* as well.

Jupiter is
made of gas

and maybe Venus.

To be exact, they're called
Mercury, Venus, Earth,
Mars, Jupiter, Saturn,
Uranus, Pluto, Neptune.

They have just
recently discovered

Again, he spelled words the way they sound, such as *egzakt* for *exact,* rather than the way their sounds are represented in English orthography. Also, note how he does not realize that English words rarely end in the letter *v* (e.g., *hav*). This illustrates how a word can be read accurately hundreds of times if one has sufficient orthographic recognition for reading, and still not be mapped sufficiently to enable full recall of the word's spelling.

Additional examples of his attempted spellings from an essay are presented below. Just from viewing this small set of words, it is clear that Spence is listening to the sounds in words and that he also has a strong vocabulary.
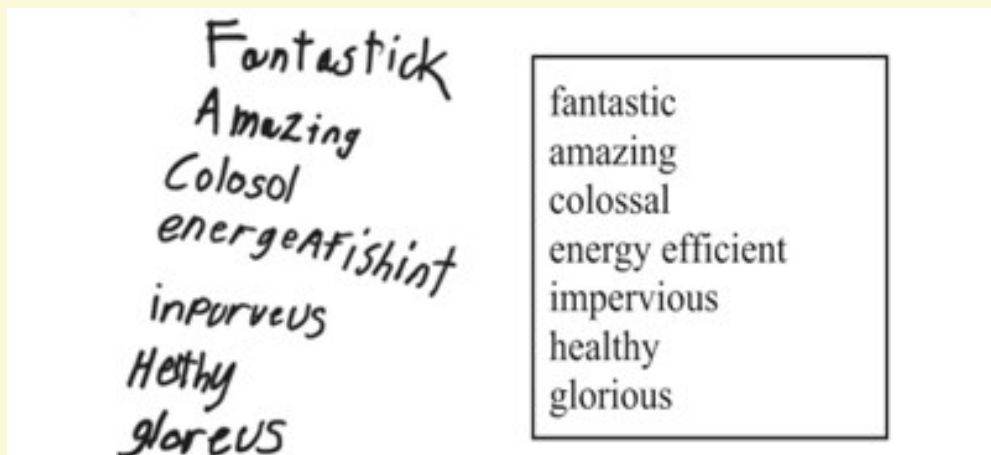
Aaron. Aaron is in the eighth grade. He has received three years of special education services. Unlike Spence who had no diffifculty with reading, Aaron struggles with both reading and spelling. His teacher reports that he is still about two years behind in reading but is progressing quite well. A writing sample from Aaron with a translation is presented below. His teacher provided him with the spelling of the title: Mystical Creatures.

A severe discrepancy exists between Aaron's ideation and his spelling. He spells several common irregular words incorrectly but attempts to preserve the sound structure of the words (e.g., *wee, sum, wher, wen, lokt*). The spelling of the word visited as *vizzated* does not look like a possible English spelling, but it captures all of the sounds in the correct sequence.

Mystical Creatures

Handwritten version:

Mystical Creatures

Hi my name is fred.
I'm the most unique mystical creature
I'n the planit.
Becos I can travle throw time demnchins.
And I have the body of a goirla and the
weings and tell of a draggon,
The demchin I lev in is cald the land
of mystical creaturEs.
One day me and my wife talk about
doing sum time traveling.
Wee did not now wher we wanted to travle
to so we lokt at the map's we hade.
Her is one I hard Julie call out wht is
it I ask.
she bret it over and it red planit erth.
I thot about it and I rolized we have
never vizzolted this planit.
And that is oven the trable began.

Typed version:

Mystical Creatures

Hi, my name is Fred.
I'm the most unique mystical creature
In the planet.
Because I can travel through time dimensions.
I have the body of a gargoyle and the
wings and tail of a dragon.
The dimension I live in is called the land
of mystical creatures.
One day me and my wife talked about
doing some time traveling.
We did not know where we wanted to travel
to so we looked at the maps we had.
Here is when I heard Julie call out. What is
it I ask?
She brought it over and it read planet Earth.
I thought about it and I realized we have
never visited this planet.
And that is when the trouble began.

Transcription preserving spelling errors: What is the problem with the folosiphy that a chield will lurne at there own pace, when ther ready. This can be a problem if the parence dont push the chield because the chield might not exselirate in the lurning progress if he decides that he doesent want to try. the problem will never get fixed or worked on if the child decides not to push himself. This is why the parents need to take some enishstave and have some exstra time set aside for the chield to work on one or more activetys that hes struling with. for exampel if the chield is haveing problems with math and reading he should probly get some exstra time in and outside of the classroom. The chield could be stuck in one grade for…the chield does not excelirate in school as time…

Melinda. Melinda was a senior in college when she wrote the response seen above to a test question. Even though Melinda read all of her class assignments, she complained that it took her forever to complete them. Her other difficulty, a continuing source of frustration to her, was her spelling and poor punctuation. Her misspelled words are mostly phonetically accurate (e.g., *exselirate*), but she still makes spelling errors on common words that she has read thousands of times, such as *child*, *parents*, and *learning*. She spelled *they're* differently twice in the same sentence, and *parents* once incorrectly, and then correctly. Despite the amount of reading she has done, she has not mastered common spelling rules (e.g., drop the *e* before adding *ing*) or syllable patterns (e.g., *exampel*). Her pattern of errors is typical of a person with a severe weakness in orthographic memory.

Assessment of Orthographic Learning

While orthographic knowledge is obviously central to skilled word recognition, a general consensus does not exist on the best way to measure this ability (Olson et al., 1994). Over the past few decades, several types of measures have been used in research as well as on standardized tests. Some of the first measures that were developed included orthographic and homophone choice tasks (Stanovich & West, 1989).

In orthographic choice tasks, the reader chooses the word that is spelled correctly from two options that sound alike—a correctly spelled word and a pseudo-homophone (e.g., *sleep-sleap;* Manis et al., 1990). Olson et al. (1994) explained that in this type of task, although phonological processing may occur, it is not sufficient to make a decision about the accuracy of the spelling because both letter strings sound exactly the same. Precise memory for the correct letter sequence is required.

In homophone choice tasks, the reader is asked a question and then must choose the correct answer from two homophones (e.g., Which is a flower? *rows* or *rose;* Stanovich & West, 1989). In a similar task, the individual listens to a sentence such as, "The flower is a rose," and is then presented with a word that is either the correct one (e.g., *rose*) or an incorrect homonym (e.g., *rows*; Manis et al., 1990). Here, both alternatives could potentially be in the student's orthographic lexicon as a familiar sequence, but only one is correct in terms of the meaning needed to answer the question.

Another format involves a letter string choice task where the person is presented with two pseudowords, one of which contains an impermissible letter pattern. The person must choose the word that looks more like a real English word (e.g., *delk* or *dekl;* Siegel et al., 1990; Treiman, 1993).

Orthographic processing has also been measured by asking students to identify letter orientation errors (Badian, 2005) and to read and spell exception (irregular) words. Reading exception words measures a reader's skill in recognizing words instantly (Coltheart, 1978). Since the irregular part of the word has to be stored in memory and cannot be determined by sound alone, these tasks require orthographic processing. Although the use of these types of tasks has been criticized because they measure skill in both word recognition and spelling (Burt, 2006), determination of the correct response requires more than just phonological decoding, so they genuinely measure a student's orthographic memory for those words. Furthermore, a measure such as the letter string choice task (discriminating between legal and illegal spelling patterns) is not based on prior word-specific knowledge (Siegel et al., 1990), but rather on memory for common spelling patterns in written English. In 1994, Berninger noted that the lack of consensus on how to best measure orthographic processes has impeded progress. This observation is still true.

Beginning Readers

It is difficult to determine orthographic processing weaknesses in beginning readers as they have not had sufficient print exposure to develop robust memories of orthographic sequences (Stanovich & West, 1989). The development of phoneme awareness/proficiency and orthographic mapping is essential for the development of skilled orthographic processing. Thus, readers who have had limited exposure to print or who have weaknesses in phonemic processing may appear to have issues with orthographic processing. In reality, however, their difficulties may stem from weaknesses in phonemic processing, limited instruction, or inadequate opportunities with print. To help build students' orthographic knowledge in preschool and kindergarten, teachers should introduce words orally, and also write the words for the children to see (O'Leary & Ehri, 2020).

Instruction and Intervention

Although some uncertainty still exists regarding the best ways to intervene with students who have weaknesses in orthographic knowledge, initial instruction in reading should begin with a focus on developing phoneme-grapheme correspondences along with instruction in both phonemic blending and phonemic segmentation (skills needed for orthographic mapping), coupled with reading practice. Reading and spelling instruction should be integrated so that every reading rule is taught along with the corresponding spelling rule.

> *Reading and spelling instruction should be integrated so that every reading rule is taught along with the corresponding spelling rule.*

A good initial sequence of instruction for spelling would be (a) providing instruction in phoneme blending and phoneme segmenation; (b) using tasks and materials that reinforce the connections between the phonemes and graphemes and that involve the accurate sequencing of sounds; (c) teaching common letter sequences, letter patterns, and morphemes; and (d) reviewing and practicing spelling rules. Instruction in irregular words should be integrated slowly into the lessons, drawing attention to the irregular part of the word by highlighting, circling, or color coding it. While researchers have not directed much attention to the practice, decades of practical experience in teaching have suggested that multimodal presentations of letters, word parts, and words may be useful, such as having a student say the letter or word, trace the letter or word several times while saying the letter sounds, and then write the word from memory.

Past first grade, the development of phonemic proficiency, which appears to be facilitated by training of skills using phonemic substitution and deletion activities, will help readers develop more detailed and automatic analyses of the internal structure of words and acquire increasingly explicit and more solidly established orthographic representations (Kilpatrick, 2015). Overall, the most effective interventions for students with weaknesses in orthographic processing include phonemic manipulation activities, systematic phonics and spelling instruction, and fluency building activities.

Remaining Questions

Although controversy still exists regarding the exact role of orthographic processing in reading and spelling, clearly, some individuals with dyslexia have trouble storing and retrieving specific letter sequences in words, which affects both their reading and spelling development. Kilpatrick (2015) differentiates between visual memory, which has little to do with reading, and orthographic memory (the ability to establish and retrieve specific letter sequences), which is necessary for both reading and spelling. Learning sight words is not based on picture-like retrieval of whole words, but rather on mapping written words to their pronunciations (Miles & Ehri, 2019). Because some readers with dyslexia have deficient orthographic learning processes and only develop partial representations of spelling patterns and words, the formation of these connections is much slower to develop (Ehri & Saltmarsh, 1995). The goals should be to help them develop phonemic awareness skills and, subsequently, the accuracy and automaticity of word reading skills displayed by their typically developing peers.

Why is this mapping such an easy process for most readers, but so slow to develop for others? Although the development of orthographic knowledge clearly depends upon both phonemic awareness and print experience, how do we explain students like Samantha whose data was described at the opening of this paper and Spence, who have advanced oral language proficiency, good phonemic awareness (at least on untimed tasks), and are avid readers, but poor spellers? Most likely they have acquired partial representations of words that are sufficient for reading but not for spelling. Why is Melinda an accurate but slow reader, and why does Aaron struggle with both reading and spelling? Are their representations of words even more impaired, thus compromising both areas of literacy development?

Final Thought

For typically developing readers for whom sight word acquisition happens with such ease, orthographic knowledge seems to develop as a matter of course. For struggling readers and spellers, including some students with dyslexia and/or dysgraphia, a weakness in orthographic processing is a major contributing factor to their reading and spelling difficulties. These students require skillful intervention.

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Should we assess and train learning and study strategies?

Cecil R. Reynolds, PhD

Abstract

Research for more than 50 years in educational and related areas of psychology has demonstrated repeatedly that students who engage in strategic learning and test-taking perform at higher levels academically than those who do not. Academic achievement levels can be improved significantly by improving the study skills, learning, reading comprehension, test-taking, and related strategies of learners at all ages and is effective with both general and special education students. Many students will not develop them, and yet these are all skills that can be taught. These skills are critical to success in learning. These skills are even more critical as learning becomes more self-driven and independent with less structured supervision as is common in virtual environments and advanced studies. Knowing how to study and learn also enhances student motivation. Teaching students how to study and learn produces empowered learners who enjoy higher academic achievement levels and a wider array of lifetime opportunities. Lifetime learning is more important today than ever and always will be—not only does strategy instruction improve outcomes in the classroom now, but it provides the foundation for a lifetime of learning.

Key words: study skills, strategic learning, strategy instruction, lifetime learning

Research for more than 50 years in educational and related areas of psychology has demonstrated repeatedly that students who engage in strategic learning and test-taking perform at higher levels academically than those who do not. Academic achievement levels can be improved significantly by improving the study skills, learning, reading comprehension, test-taking, and related strategies of learners at all ages and is effective with both general and special education students. Many students will not develop them, and yet these are all skills that can be taught. Minority and lower socioeconomic status (SES) students are less likely to have these skills without instruction. These skills are critical to success in learning. These skills are even more critical as learning becomes more self-driven and independent with less structured supervision as is common in virtual environments and advanced studies. Despite research on the effectiveness of teaching learning and study strategies, schools do not teach these skills directly, but seem to assume that students will develop adequate, workable skills in these domains on their own.

Learning strategies are NOT what has become known as Learning Styles nor even remotely related to this popular, yet disproven concept. Learning Styles, commonly wherein students are characterized for example as visual learners, auditory learners, or even tactile learners is questionable as a theoretical or practical model for learning but also emphasizes passive modalities wherein students are seen as simple receptors of knowledge or skills being taught. In adopting the concept of learning styles, teachers are told to adapt their teaching and presentation styles to these receptive characteristics of students—students are not asked to alter their level of engagement with the material—they simply receive the information in a different format. Learning strategies are quite different and require active involvement on the part of the student and engagement with the material or skills to be learned.

Learning Strategies are defined as: "The purposeful behaviors of a learner that are intended to facilitate the acquisition and processing of information." This means that students who use effective learning strategies (and not all strategies students generate on their own are effective, hence another need to teach effective strategies) must engage with the material to be learned and actively manipulate the material—an activity itself that is known to promote learning.

Despite the many benefits of teaching and using such strategies, they simply are not being taught either at all or effectively where some efforts are made. In their biennial survey of the curriculum of the public schools in the USA, the American College Testing program, noted for example that: "In reading, instruction in the 11th and 12th grades may not prepare students for college level reading assignments (especially considering the number of college freshmen who enroll in a remedial reading course). A greater emphasis in teaching reading strategies is present in remedial reading courses at the postsecondary level—the same strategies that seem no longer taught at the high school level …." (p.39) (ACT, 2007).

Subsequent looks at teaching curricula and at the increasing numbers of college students enrolling in remedial reading even at major universities, indicates nothing about this conclusion has changed!!

For example, as reading comprehension skills are such a salient outcome of any education and a precursor to a life time of learning opportunities, the following quote from the eminent reading researcher Michael Pressley, in his last major paper before his untimely death, highlights some of these issues.

> "It should come as no surprise…we are frustrated with the over-attention to sound, letter, and word-level processing that characterizes instruction for struggling readers, given the evidence that progress often boils down to a little progress in learning how to sound out words and only small improvement in comprehension… When skilled readers read, they are very active before, during, and after reading in the service of getting meaning from text." (Pressley et al, 2009, p. 529).

While acknowledging that word-calling fluency is a necessary foundation or precursor to reading, passive listening to word-calling in our heads does not promote comprehension—we must manipulate information to understand it. This requires the use of multiple strategies—and in reading comprehension, as well as other areas of learning and study strategies, evidence-based solutions exist as specific strategies and are known to enhance learning and comprehension, strategies that can easily be taught.

Theoretical Models

A variety of theoretical models for learning strategies exist and are remarkably similar as reviewed. For example Weinstein and Mayer (1986) developed a model denoting the importance generally of:

- Rehearsal

- Elaboration

- Organisation

- Comprehension Monitoring

- Affective Strategies

Weinstein (1994) later simplified this to her well known model of strategic learning including Skills, Will, Self-Regulation. Zimmerman (1998) devised a model of 3 cycling phases of learning: Forethought, performance or volitional control, and self-reflection. Contemporaneously, Winne and Hadwin (1998) published a model of 4 phases of learning, telling learners to: Define the task; set goals and devise a strategy; use tactics and strategies; monitor, evaluate, and make changes.

All of these models, which remain current and have more in common than ways in which they differ (e.g., see Ambrose et al, 2010) lead to a variety of avenues to action-based approaches to studying and learning that have been researched at length for effectiveness. What we find remarkable is that the major theories of learning and study strategies show a near total convergence when the details of the theories are examined—it seems that all of the major approaches discuss similar issues, skills, and the need for self-regulation, especially self-monitoring, but using different vocabularies for many of these terms. This convergence of theories points to a mature field and one with remarkably consistent research outcomes as a whole. All of these models call for the learner to employ active strategies.

Teaching learning and study strategies has many benefits. Knowing how to study and learn enhances student motivation and leads to more time spent learning—we all tend to spend more time doing a thing we are successful in accomplishing, and if we make students more successful, they will naturally engage

more with learning and skill acquisition. Teaching students how to study and learn produces empowered learners, and such students enjoy higher academic achievement levels and a wider array of lifetime opportunities. Students who engage in strategic learning and test-taking perform at higher academic levels than those who do not. If you improve the study skills, learning strategies, reading comprehension, and test-taking behavior of students, their academic achievement will also improve. This is true at all grade levels, with both general and special education students. In the age of pandemics, we also know now that at-home learning makes more demands on the individual student's skills in organizing, studying, comprehending, strategic listening, and self-motivating—teaching these skills improves at-home and other distances learning performances.

Assessment of Learning and Study Strategies

Such key skills and strategies as study skills, learning strategies, strategies for achieving high levels of reading comprehension, and test-taking strategies among others to be covered can be well measured via the School Motivation and Learning Strategies Inventory (SMALSI; Stroud & Reynolds, 2006), a scale developed for use with students from 8 years of age through college. Clear assessment allows us to maximize instructional time by targeting areas of deficiency in individual pupils with evidence-based techniques for remediating measured deficiencies. The SMALSI consists of items assessing 7 strengths scales associated with development and use of learning strategies as well as 3 areas of what are characterized as liabilities, i. e., attributes that detract from learning and the correct expression of what has been learned.

Seven Strength Areas:

1. Test-Taking Strategies,

2. Study Strategies,

3. Writing-Research Skills,

4. Reading Comprehension Strategies,

5. Note Taking and Listening Skills,

6. Time Management, and

7. Organizational Techniques

Three Liability Areas:

1. Test Anxiety

2. Attention and Concentration

3. Academic Motivation

Data from the SMALSI Manual as well as follow up research in various peer-review journals has indicated scores on these scales to be associated with performance on a variety of academic achievement tests (e. g., see Babcock, Wilson, & Lau, 2018; Janzen, Cormier, Hetherington, Mrazik, & Mousavi, 2015). These constructs can be assessed with scores having strong levels of reliability from age 8 years on into the college years. Specific strategies known to be most effective along with detailed guides to teaching such strategies in each domain listed above can be found in Vannest, Stroud, and Reynolds (2011).

Teaching Strategies for Effective Learning

It has been recommended for decades that such skills and strategies be taught to not only general students, but students with a variety of learning problems including students with Attention Deficit Hyperactivity Disorder, common learning disabilities, and even students with psychiatric or related behavioral disorders (e. g., see Brackney & Karabenick, 1995; DuPaul & Stoner, 1994; Mastropieri, Leinart, & Scruggs, 1999; Scruggs & Mastropieri, 2013; Stroud & Reynolds, 2006).

Strategies do not exist in isolation. Rather, they are intertwined with other factors, including motivation and metacognition, hence the breadth of assessment and inclusion of factors such as motivation in the SMALSI assessment. Strategy instruction appears to be the most effective when coupled with other academic content. The inclusion of strategy instruction as a component of remedial instruction with students who have a variety of learning disorders has been shown to enhance the effects of typical remedial instruction in significant ways. For example, in a comprehensive meta-analysis, Scammacca et al. (2007) examined outcomes from intervention studies conducted with adolescent students with reading difficulties. Instruction in reading comprehension strategies was associated with the largest effects.

While the teaching of reading comprehension strategies has been emphasized thus far, the literature is replete with support for strategy instruction in other areas assessed by the SMALSI. Study skills is a prime example. Gettinger and Seibert (2002) pointed out four aspects of studying that make it a unique academic task and one where strategic approaches are maximally fruitful. First, it is skillful. It requires instruction for acquiring and retaining important information. Studying is also a purposeful or intentional task that requires

effort. Next, unlike the classroom where much learning takes place as a group or with some sort of social interaction, studying is typically, though not exclusively, an individual process that is highly dependent on the characteristics of the student. Fourth, studying relies heavily on self-regulation or monitoring.

When studying, students need to be able to develop a strategy and apply it as well as to identify important information, to make associations when learning, to use a variety of resources when a concept is not understood, and to use strategies for memory and encoding. Students receive an enormous amount of academic information. Being able to select and arrange information according to a valid hierarchy is crucial to developing effective study strategies. Having a systematic, strategic approach to studying is important to learning as well. Students perform better academically when strategies for learning and study are taught and applied (e.g., Alexander & Murphy, 1998; Paris & Winegrad, 1990; Schraw & Reynolds, 2009). Teaching methods for organizing information from different sources such as class notes, textbooks, and worksheets or homework, as well as memory aids should be included in general learning strategies approaches. Such rehearsal, elaboration, and organizational strategies are essential for acquiring and using information in a meaningful way and can be taught in a group or individual setting (e.g., Weinstein & Hume, 1998).

Study strategies would primarily include those used to aid in storing and retrieving information. Mnemonics are helpful tools for remembering information or necessary steps for other types of learning, particularly for special populations such as students with behavioral and emotional difficulties (Mastropieri & Scruggs, 1999, 1998). They are essential for transferring information from working memory to long term memory, the main goal of studying. Three types include letter (i.e., acronyms and acrostics), keyword (relating new material to a familiar word that can be visualized to help remember the new information), and pegword (ordered information is connected using rhyme and pictures) (Kleinheksel & Summy, 2003). Key strategies for studying have been identified that improve student academic outcomes, strategies that are evidence-based and distinctly teachable (e. g., see Vannest, Stroud, & Reynolds, 2011).

The routine teaching of learning strategies in general education classrooms provides some inoculation from academic deficiencies (i.e., prevention). This intervention and prevention characteristic of "strategy ability" occurs for some significant number of children and is not a newly discovered phenomenon but has been known for some time, e. g., see efforts by Deshler & Schumaker, 1993, and Faggella-Luby, Schumaker, & Deshler, 2007.

The teaching of strategies is viewed by many as a basic building block of learning and the acquisition of strategies for learning is nothing short of essential to becoming an effective, self-regulated learner (e. g., Barth, 2020; Ertmer & Newby, 1996; Zimmerman, 2002, 1986).

We have also determined the most effective teaching approaches for successful instruction in teaching learning strategies (Vannest, Stroud, and Reynolds, 2011). Direct instruction models, that target the skills to be learned are the most effective and direct the teacher to engage in clear, direct instruction that includes **4** components:

- Direct explanation

- Modeling by the teacher

- Guided practice

- Application

We are most efficacious in this process when we assess the knowledge of individual students regarding the use of effective learning strategies and teach the specific skills lacking for the individual student, or in some cases instructing entire classrooms where group weaknesses have been determined to exist. Vannest, Stroud, and Reynolds (2011) have devised detailed direct instruction scripts for the most effective learning and study strategies and made them available for teachers and educational consultants and psychologists who work with teachers and children with deficient skill sets.

Summary and Conclusion

Simply put, research over the past 50 or more years in educational, school, cognitive, and related areas of psychology has demonstrated repeatedly that students who engage in strategic learning and test-taking perform at higher levels academically than those who do not. We have reliable and valid means of assessing students' knowledge and skills in the key domains related to knowing how to learn, which is really what learning and study strategies are about. Academic achievement levels can be improved significantly by improving the study skills, learning, reading comprehension, test-taking, and related strategies of learners at all ages and is effective with both general and special education students. Knowing how to study and learn enhances student motivation. Teaching students how to study and learn produces empowered learners who enjoy higher academic achievement levels and a wider array of lifetime opportunities. The old adage is true, "If you give a hungry man a fish, he eats for a day. If you teach the man to fish, he eats for a lifetime." Lifetime learning is more important today than ever and always will be—

not only does strategy instruction improve outcomes in the classroom now, but provides the foundation for a lifetime of learning.

To then address the titular question: 'Should we assess and train learning and study strategies?' Yes.

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The importance of simultaneous, interconnected processing when learning to read; evidence from a case study school

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Abstract

The research reported in this paper considers the implementation of the Harberton Reading Programme (HRP) in a mainstream school with a group of children in Year 2 (Year 1 England). This case study school identified that each year there was a group of children who were unable to learn to read using systematic synthetic phonics (SSP) and their difficulties persisted throughout the primary school. In September 2014, nineteen children aged 5 to 6 years (in a year group of 99) were identified as experiencing significant difficulties. They had made no progress using the SSP approach. These children were selected for intervention using the HRP and this first cohort is the subject of this paper. A key finding from the original HRP research and development project (2000-2002) was that children with moderate learning difficulties (MLD) and severe literacy difficulties (for whom this programme was originally developed) could not learn any phoneme-to-grapheme correspondences until they had sight words in memory to which they could anchor this learning. Furthermore, the development of orthographic, semantic and syntactic knowledge was found to have an important role in supporting the learning and recall of a reading vocabulary. The research in this mainstream primary case study school confirmed that these findings apply to children within the normal range of ability who are unable to learn to read using systematic synthetic phonics, and not just to children with moderate learning difficulties.The HRP is designed to establish the foundational literacy skills necessary for learning to take place and is normally completed within six months to two years depending on the individual needs of each child.

Key words: literacy difficulties, memory, phonics, reading, orthographic knowledge

Introduction

How children learn to read has been a matter of considerable debate. The teaching of reading has seen '*swings from phonics to 'real' reading (without phonics) to an integration of the two, and back again to a domination of phonics'* Crombie (2012: page 143). As Crombie points out, these changes come without the necessary consideration of the comprehensive range of factors that impact children's learning. The issue of overdependence on one strategy is not new. It is interesting to note that over a century ago the dominance

of phonics when learning to read was a concern. Huey (1908), whilst being an advocate of phonics teaching, expressed concern about mechanical, stumbling, expressionless readers who, he observed, were over reliant on phonics when reading. The importance of phonics within the beginning reading programme is well established, but the predominance of phonics teaching at phoneme level only is not supported by research evidence, as pointed out by Castles and Coltheart (2004). They contend that progress in learning to read may be the result of an unassessed variable because the causal relationship between phonemic awareness and reading is not supported by conclusive evidence. The research supporting systematic phonics teaching, within the beginning reading programme, does not limit phonics teaching to phoneme-to-grapheme correspondence only, but includes phonics teaching at orthographic levels of onset and rime and syllable (National Reading Panel, 2000). Certainly, the case of LF (pseudonym) reported by Stothard, Snowling and Hulme (1996), is an example of a child with a severe phonological deficit, who learned to read and spell at a normal rate despite being unable to perceive phonemes and link them to their associated graphemes. LF recognised groups of letters that represented groups of sounds (phonics at orthographic levels) without being able to identify the individual phonemes within these groups.

The Harberton Reading Programme (HRP)

The Harberton Reading Programme (HRP) was developed for children with moderate learning difficulties (IQs 51-69) and severe literacy difficulties (McMurray, 2000-2002). The programme is designed to ensure the integration of all reading skills at compatible levels, within the memory capacity of the child. Semantic and syntactic knowledge, automatic sight word recognition (orthographic knowledge) and rudimentary phonic skills are explicitly taught in advance of the HRP reading books to ensure reading fluency from the beginning.

Background to the development of the Harberton Reading Programme (HRP)

The approach used by McMurray when developing the HRP incorporated methods that were used when she taught Year 1 children (reception in England) in the normal range of ability (IQs 70-130) from 1980-87. The difference from the original method being the pace of learning and the extent of the repetition needed for children in the moderate learning difficulty range (IQs 51-69). The mainstream reading schemes available in the 1970s and 1980s enabled the teaching of sight words in advance of the first reading books, ensuring children could read with fluency without the necessity to guess at words or decode phoneme-by-phoneme. These methods to teach sight words included a range of activities to develop semantic, syntactic, and orthographic awareness to build associations in memory for effective word recognition. Learning was not via a 'look and say' approach, but 'look and say' was used to test memory recall. However, by the 1990s

the whole language movement in the UK had gained momentum and reading schemes were changing; they no longer had the gradual vocabulary build up from short phrases to full sentences. Proponents of the whole language approach considered the language in the reading schemes of the 70s and 80s to be stilted, overly repetitious and not like 'real' spoken language, consequently 'real' books and book banding became the reading diet. The new structured reading schemes that were developed adhered to the whole language approach in the content of the beginning stages. These beginning stages did not have the same step-by-step build up in vocabulary as reading schemes had prior to this whole language movement.

It became clear from the early 2000s that there was a movement to see a return to phonics teaching, but the lessons from the implementation of the whole language approach, which was implemented without robust research evidence, had not been learned. Systematic Synthetic Phonics (SSP) was recommended (Rose, 2006) despite there being no robust research evidence to support the implementation of a systematic synthetic phonics only strategy. Rose (2006) acknowledged the lack of research evidence and chose to consider evidence from practice observed in school inspections.

> '...and notwithstanding the uncertainties of research, there is much convincing evidence to show from the practice observed that, as generally understood, 'synthetic' phonics is the form of systematic phonic work that offers the vast majority of beginners the best route to becoming skilled readers' (Rose, 2006 page 19, paragraph 47)

By stating that this approach offers '*the vast majority of beginners the best route to becoming skilled readers'* Rose acknowledged that SSP was not going to meet the needs of all children. As a consequence of the focus on an alphabetic phonics only strategy, the acquisition of orthographic knowledge has been left to chance. One of the biggest failures in the interpretation of the phonological deficit was that later potential difficulties in orthographic processing were not identified, despite there being sufficient evidence to warrant caution (Treiman, 1985 & 1986; Goswami, 1986; Lennox and Siegal, 1994; Brown and Ellis 1994; Badian, 1997; McMurray, 2006; Turner and Bodien, 2007: McMurray, 2008). Difficulties that multiple mappings from spelling to sound and sound to spelling cause children with orthographic processing difficulties (McMurray, 2020) and the working memory difficulties that arise when blending complex syllables (Gathercole and Alloway, 2008; Alloway, 2011; Alloway and Alloway 2015) were not considered. Account should have been taken of the complexity of the structure of syllables in English, which had been highlighted by Treiman (1985, 1986) and Goswami (1986). Proponents of the whole language movement failed to recognise the importance of systematic phonics teaching, and now proponents of SSP have failed to recognise the importance of developing orthographic knowledge (in particular the ability to recognize spelling patterns

and sequences that represent clusters of letters representing phonemes blended together without having to decode phoneme by phoneme), and they have failed to recognise that this aspect of orthographic knowledge cannot be developed through an alphabetic phonics strategy alone.

What evidence do DfE statistics provide?

Teaching methods in the UK continue to follow a SSP first and only approach, which has not seen an improvement in results on the phonics and reading tests since 2016 (DfE 2019 statistics). Indeed in 2019, prior to the pandemic, 9% of Year 2 children did not meet the standard set for phonics by the end of Year 2, this was up slightly from 2018. This means that in 2018 just under 9% of children failed the phonics test and just over 91 % passed. However, when these Year 2 children moved to Year 3 in 2019, 25% of them failed to meet the standards set for reading at the end of Year 3 (i.e., the end of KS1). This means that slightly over 16% of those who passed the phonics test a year earlier, still failed to meet the standards set for reading at the end of KS1, even though this 16% had demonstrated sufficient phoneme to grapheme knowledge to pass the test at the end of Year 2. These statistics provide evidence that SSP alone is insufficient for reading success for this group. Furthermore, in 2019, 27% did not meet the standards set for reading by the end of KS2 (DfE 2019 statistics). Despite the considerable investment in SSP programmes from 2006 to present day, over the last 30 years outcomes for the struggling readers have not improved. This is of serious concern because when Liberman and Liberman (1990) were making the case for a move away from the whole language approach to a code emphasis approach, they reported that 20-25 % of the school population failed at reading. It is important, however, to understand that this failure to obtain evidence to support SSP should not mean a return to whole language. As Bowers (2020) suggests, alternative approaches are needed.

Simultaneous interconnected processing and memory capacity model: an alternative approach Research Design and Methodology

McMurray's simultaneous interconnected processing and memory capacity model of reading development, reported in McMurray and Thompson (2016) aims to prevent children becoming non-readers. The 2000-2002 HRP action research was conducted with 18 children who had a statement of special educational needs because of their moderate learning difficulties (MLD) and severe literacy difficulties. Sharon McMurray was released from class teaching duties for 2 years (2000-2002) to develop a reading programme to meet the needs of these children. This model of reading development also aims to prevent children becoming entrenched in the use of one predominant strategy such as decoding phoneme-by-phoneme. This can prevent the brain from engaging in the decision making at a subconscious level that is

necessary to meet the varied task demands when reading words in a complex orthography such as English (McMurray, 2004; 2020; McMurray and Thompson, 2016).

Why was the HRP programme needed?

The language used in the new reading schemes available in the 1990s was not suitable for the pre-teaching of words in advance of the reading books in the first stages of these reading schemes, because of the number and variety of words used. This resulted in a heavier word load and reduced opportunities for repetition. These commercially produced beginning reading books were not suitable for some of the children in mainstream primary because they struggled with the language used, and the predication (guessing) necessary to cope with the vocabulary load. One reason for this difficulty was that some children were not yet speaking in complex sentences on school entry. For other children, pre-reading assessments indicated that they might struggle with the development of a phonics strategy because they displayed difficulties with auditory discrimination of sounds within words and the speech stream. Some children had difficulty with visual discrimination of letter patterns and left to right sequencing, a forewarning of possible orthographic processing difficulties. Potential working memory difficulties were also evident for children who could not repeat or manipulate a short visual or auditory sequence. For the MLD children she was now teaching, who were cognitively delayed in all areas, including delayed language, the simultaneous interconnected processing method was necessary, but memory capacity was a greater issue. Between 1997 and 1999 McMurray developed reading activities and reading books using clip art sold by one of the commercially produced reading schemes. The success of this approach using her "home-made" reading materials and books with children in her Year 5 MLD class (NI, children aged 8/9 years old), led to funding from the Department of Education's (Northern Ireland) Dissemination of Good Practice Initiative (DGPI).

The development of the HRP was necessary because many of the reading activities McMurray had developed with the commercial clip art were around imaginative themes and these MLD children needed more reading activities grounded in real life experiences (see figures 7 & 8). The 18 children identified for this 2000-2002 action research project were 8-11 years of age and had no basic literacy skills in place. They appeared as blank slates with no sight words or sound symbol correspondences in memory.

The 2000-2002 research and development group

The 18 participants attended group sessions with the author for eight weeks on a daily basis for one hour each day in groups of six. They engaged in reading activities to establish automatic sight word recognition in advance of receiving each reading book up to the end of level 1 (for examples see figures 1-9). They then continued using the reading materials from level two onwards in their own class until they completed

the programme. On completion of the programme all of these children had acquired sufficient literacy skills to allow them to benefit from the mainstream reading books that had been out of their reach. It should be noted that each child moved through the programme at the pace appropriate for their learning needs. Some of the children completed the programme within a six-month period while others took up to two school years.

When developing the HRP from 2000-2002 evidence of a logographic stage in reading development was not found. This group of children could not identify a word by its overall shape or a few salient features. Orthographic awareness of the sequence of letters in a word at a visual level was required for automatic sight word recognition through games such as Match, Select, Say (see figures 1 and 6) and matching activities (see figures 2 & 3). This learning could only be embedded if this was in conjunction with activities to establish the meaning of the word being learned (morphemic knowledge; morphemes are the smallest units of meaning in spoken language). It was also important for children to complete activities to develop syntactic knowledge, for example, making sentences by putting words in the correct order to make sense (see figures 5 and 7)); and semantic knowledge by completing simple cloze procedure activities (see Figure 8). The first letter in every word is coloured using a traffic light system in the first three levels of the programme (see figure 9). This is to draw children's eye to the start of each word, addressing the difficulties some children have knowing where each word starts and ends. Figures 1-5 provide examples of some of the activities which are completed in advance of the level 1 reading books to establish automatic sight word recognition for five sight words in level 1: *Mum*, *Pam*, *Sid, is, here*.

Figure 1

Match Select Say Game 1 (played in advance of level 1 reading books)
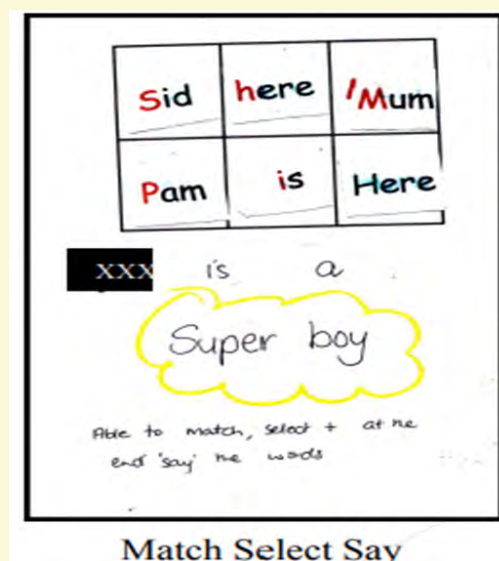

Match Select Say

Figure 2

Activity to develop orthographic knowledge in advance of level 1 reading books. Children write the words in the correct boxes attending to sequence, size and orientation of the letters in each word
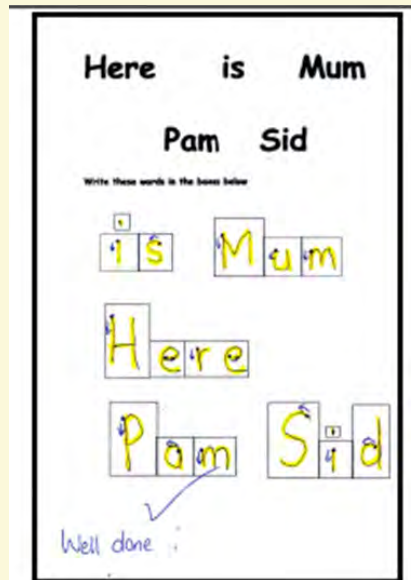

Figure 3

Activity to develop orthographic knowledge. Matching the letters in a word from left to right (cut and stick activity)
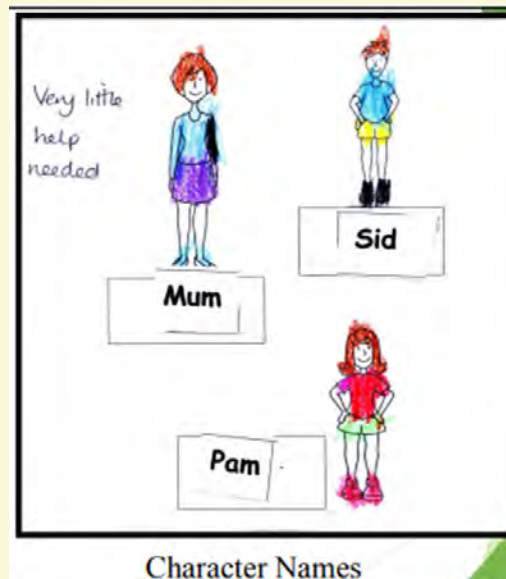
Figure 4

Matching activity

Character Names

Figure 5

Developing syntactic knowledge. Sequencing words in the correct order to make sense
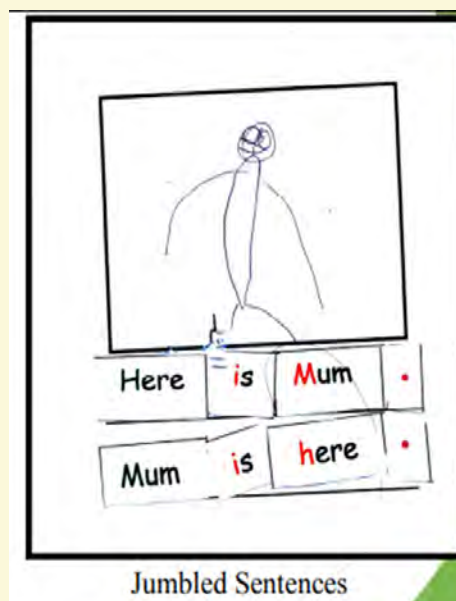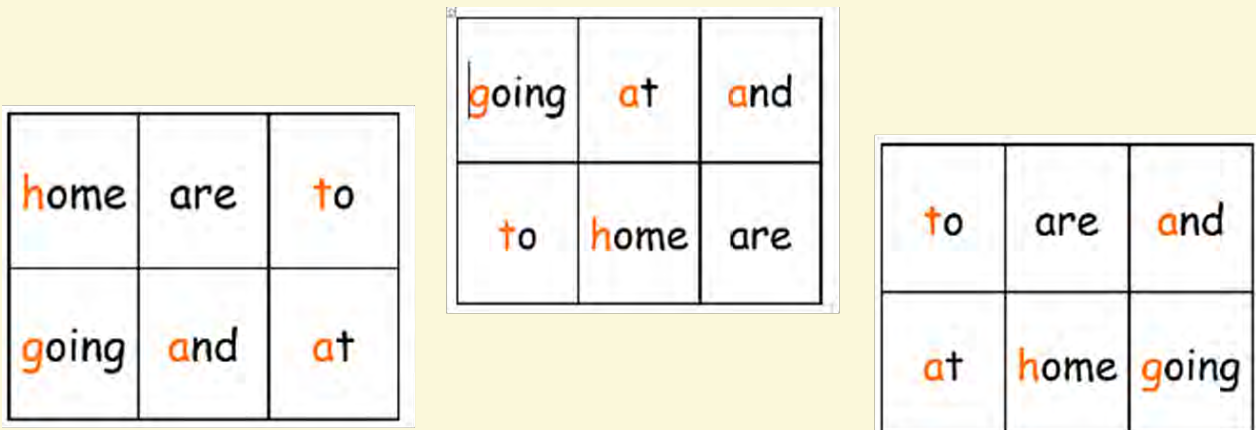

Jumbled Sentences

Figure 6

Level 2 Match, Select, Say Game 2 (orthographic knowledge)

Words to be taught in advance of getting the level 3 reading books.

Examples of 5 of the 9 activities from Level 2

Figure 7

Answering questions by writing a full sentence for the answer and ordering words in a jumbled sentences to make sense (syntactic knowledge)

Figure 8

Reading for meaning (semantic knowledge) and orthographic tracking
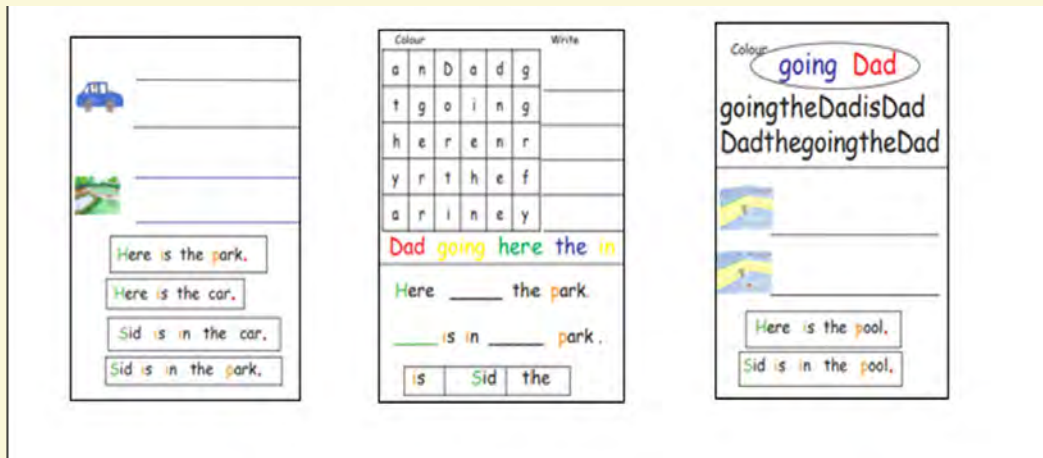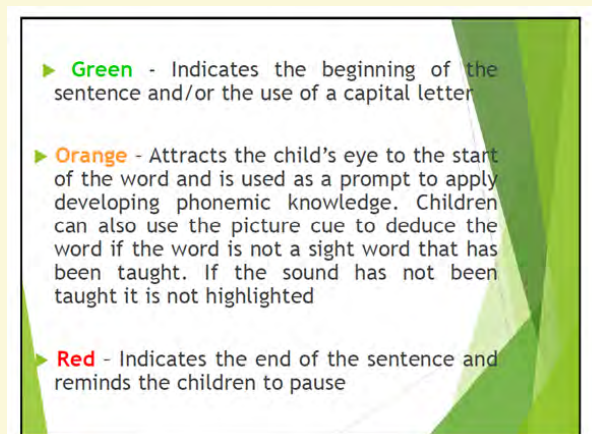

Figure 9

Colour coding in the reading books (up to level 3)

When a small sight vocabulary was developed, only then could knowledge of initial consonant sounds be secured, as these words became anchors for remembering initial consonant phonemes. As Adams (1990) pointed out, when learned in isolation, phoneme-to-grapheme correspondences are 'meaningless' 'perceptually sparse', 'confusable' and consequently easily forgotten (p. 239), asserting that the teaching of letter sound correspondences, for some children, must be spread over time and not rushed. McMurray (2000- 2002) found this to be the case. The ability to establish phoneme-to-grapheme correspondences lagged-behind the development of an orthographic strategy for sight word recognition which was linked with the development of semantic and syntactic processing and vocabulary development. It was clear that learning all phoneme-to-grapheme correspondences absolutely, was beyond the capacity of children with these difficulties and that this was particularly the case for vowel sounds.

There are 39-43 sight words in the HRP in total. These are built up gradually throughout the programme and are taught and recognised on sight in advance of getting the reading book. In the first stage there are only 5 sight words, and the pace of learning must be taken slowly as these children have nothing to anchor learning to. The first anchors for new learning are being established through workbook activities. Throughout the programme the reading book is the celebration of success, not the teaching tool, and children receive each reading book once the vocabulary has been taught through the associated workbook activities. This is to ensure that children experience success and can read fluently from the beginning.

The reading books

https://vimeo.com/798027698/44985fcc1a

Data collection

This case study was undertaken by Gemma O'Neill, the SENCo in a large, mainstream primary school in Northern Ireland. The school had an enrolment of just over 700 pupils. This case study school is in one of the most deprived areas in Northern Ireland, experiencing high levels of social, economic and educational need. The careful monitoring of children in this school to identify needs, had been part of their normal way of working in the years prior to the introduction of the HRP. This good practice resulted in the school being found to be 'outstanding' with a dedicated and skilled staff, when inspected by the Education and Training Inspectorate (ETI, the Northern Ireland equivalent of OFSTED). The SSP programme used in the school was followed with fidelity, keeping strictly to the methodology and content. The literacy coordinator has Associate Member of the British Dyslexia Association (AMBDA) and had worked for the Education Authority training teachers in schools in the use of SSP. Prior to the introduction of the HRP, it was apparent, through teacher-based assessment and observation, that year-on-year there were children who were unable to

access the most basic of literacy skills and were entering Key Stage 2 as non-readers despite fidelity to the SSP programme and expert teaching.

Formally Diagnosed Conditions: Dys = Dyslexia / ASD = Autistic Spectrum Disorder (Autism) / CA = Chronic Anxiety / ADHD = Attention Deficit Hyperactivity Disorder

In September 2014 nineteen children in a year group of 99, were selected for the HRP at the beginning of Year 2 (equivalent Year 1 in England). Four of these children are not included in Table 1 because two were subsequently statemented as having Moderate Learning Difficulties (MLD) and moved to a special school in Year 3. Two more children left the school before the final assessment in February 2020. Four children, who were not selected in Year 2, were selected for the HRP in Year 3 because their progress was now a concern even though they had some sight words (see Table 1). They were struggling with the SSP programme, and it was clear they needed an alternative approach.

The HRP is designed to secure the foundational skills necessary for progress in reading to be made. It is best to think of it as being like the foundations of a house, not visible, but essential for a successful build. The HRP, therefore, is not a programme for improving reading and will not take reading to the point where it measures on standardised scores. It is a programme for teaching the skills that enable reading to develop. In Year 3 standardised scores in reading were gathered, and collected for the final time in February 2020 when the children were in Year 7 as the pandemic had gained momentum and it was clear that schools might close.

As discussed by the SENCo (O'Neill, 2018 https://vimeo.com/455962790/7f9ecc7363) prior to the introduction of the HRP there was always a group of children who, in Year 7, would not have scored beyond 69 in a standardised reading test. All of the children who had been using the HRP, met or exceeded their expected targets. O'Neill considers the ability to intervene early, before standardised assessments are possible, to be one of the most important benefits of the programme.

The five children with a diagnosis of autism (see Table 1) loved the structure of the HRP activities and performed well on standardised reading scores. This supports the findings of Morrow and Kee (2023) who investigated the progress of children with autism who attended a primary specialist school for children on the autistic spectrum. These children had failed to make progress using SSP but made progress with the HRP.Over the period of the HRP intervention with this first cohort of children O'Neill and colleagues worked with groups of a maximum of 12 children who attended for a one hour session twice a week. Children exited the HRP when they were ready and not at any preset time, but it was expected that all children would be finished by June of Year 4 (equivalent Year 3 in England). This is why the data has a range of exit dates.

Findings

Table 1 shows the progress made by the children who participated in the study.

Case Study Participants	Entry and exit from HRP	Total number of High Frequency Words (HFW) known on entry	Total number of HFWs known on exit	NGRT 6-7 (Yr 3)	NGRT 10-11 (YR 7)
A1	JAN Year 3 to FEB Year 4	30	192	76	85
A2	JAN Year 3 to FEB Year 4	27	147	69	81
A3	SEP Year 2 to FEB Year 4	0	127	69	82
A4	SEP Year 2 to FEB Year 4	0	148	69	88
A5	SEP Year 2 to APR Year 4	0	169	69	77
A6	JAN Year 3 to FEB Year 4	29	178	85	100
A7	SEP Year 2 to JUNE Year 4	0	187	69	84
A8	SEP Year 2 to JUNE Year 4	0	178	69	99
A9 ASD	SEP Year 2 to APR Year 4	0	194	72	92
A10 Dys	SEP Year 2 to JUNE Year 4	0	183	69	88
A11	JAN Year 2 to FEB Year 4	30	197	69	85
A12	SEP Year 2 to FEB Year 4	0	192	70	101
A13 ASD	SEP Year 2 to APR Year 4	0	200	74	118
A14	JAN Year 3 to APR Year 4	24	199	74	109
A15 ASD	SEP Year 2 to APR Year 4	0	196	69	122
A16 Dys CA ASD	SEP Year 2 to JUNE Year 4	0	144	69	77
A17 Dys CA	SEP Year 2 to APR Year 4	0	178	72	77
A18 Dys ASD ADHD	SEP Year 2 to JUNE Year 4	0	163	69	85
A19 Dys ADHD	SEP Year 2 to APR Year 4	0	188	69	76

Table 1

The HRP: first cohort to use the programme. Progress from entry in Year 2 (2014/15) or Year 3 (2015/2016) until Year 7 (February 2020)
 Year 2 (NI) = Year 1 (England)

According to O'Neill the structure and approach used to deliver the HRP not only resulted in literacy attainment, but also impacted positively on the children's confidence and self-esteem as reported by

parents and staff in response to a questionnaire used as part of the continuous monitoring and evaluation process established within the school. This was particularly important given the school's catchment area and the level of social, economic, and educational need. The HRP enabled children to acquire the foundations or building blocks necessary to access the literacy curriculum. This transferred to other areas of the curriculum, not only because they could now read, but because they developed the confidence needed to try something or give it a go. This was captured by one-to-one pupil interviews held routinely as part of the schools monitoring and evaluation process for all children with special educational needs.

O'Neill reports that these children no longer viewed themselves as always needing support with work tasks. This was evident in their ability to work independently, and their greater confidence, in KS2, to take on roles within the school community such as Eco Council, Junior leadership Team and Rights Respecting Council. This mainstream case study school used the HRP for reading but continued to teach spelling using SSP. Children with dyslexia, who are insensitive to orthographic patterns, need a systematic spelling programme with a focus on onset and rime patterns to improve not only their spelling accuracy, but also automatic sight word recognition. For example, results for the CSP Spelling and Language Programme (McMurray & Fleming, 2014) are presented in Lavan, & Talcott (2021). If an approach to teaching spelling which integrates phonic, orthographic and morphemic knowledge at compatible levels had been used from the beginning, it is reasonable to suggest that progress for the children diagnosed as dyslexic and the others in the study would have been greater.

Discussion and Conclusion

The HRP is designed to ensure that all of the skills in learning to read (automatic sight word recognition, phonics, semantic and syntactic knowledge) develop at compatible levels within the memory capacity of each child. For children in the normal range of ability who experience significant difficulties with SSP these skills must be explicitly taught and not left to implicit learning. It is important that children can draw on all of these skills simultaneously to meet the varied task demands of word recognition in a complex orthography such as English. Wyse and Bradbury in their review paper published in 2022, identify three approaches to teaching reading, synthetic phonics, whole language and a balanced approach. It is a concern that Wyse and Bradbury refer only to synthetic phonics and not phonics teaching at alphabetic and orthographic levels (McMurray, 2022 provides a fuller discussion of alphabetic and orthographic phonics).
What is meant by the concept of a 'balanced approach' is open to interpretation and care must be taken to ensure that it does not result in a pick and mix of methods and materials that are ineffective for the needs of the group of children discussed here. There is a need for the further development of beginning reading

materials developed specifically for children in the normal range of ability that ensure children can read for meaning, with fluency, and apply a range of reading strategies from the very beginning. Decodable books are a concern because they do not provide children with the opportunity to use a range of strategies and may reinforce dependence on the use of phoneme-to-grapheme correspondence entrenching further the orthographic processing difficulties experienced by some children (McMurray, 2020). Nor can we have a return to the whole language approach to teaching reading, a view supported by Bowers (2020) who contends that alternative approaches to SSP and the whole language approach are needed.

The HRP is an alternative approach which has been successful for the children in this case study school, but it was written for children with moderate learning difficulties. There is a need for additional reading material to be developed that uses the methods discussed here, but offers a wider range of themes and vocabulary for children whose memory capacity and expressive language is greater. The simultaneous, interconnected processing model developed by McMurray, takes account of memory capacity to enable anchors to be established in memory connecting sight word recognition with semantic, syntactic and phonic knowledge. For this group of children these connections cannot be established by a focus on SSP alone.

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The relationship between executive functioning and diagnostic labels

Dr Rebecca Ashton

Abstract

This article reviews the links between executive functioning and diagnostic labels. A case will be made for viewing the three key factors within executive functioning as key aspects of specific conditions: inhibition overlaps with ADHD; flexibility with autism and updating with specific learning difficulties. Practitioners working within education and psychology may find it useful to consider these executive skills in their assessments of individual learning needs, as a contribution to diagnostic processes, as part of the formulation supporting shared understanding of the individual's situation, and as potential avenues for intervention.

Key words: executive; diagnosis; working memory; inhibition; flexibility; updating

Introduction

Executive functioning (EF) is a relatively new term, which only came to prominence in the 1980s, and did not appear in most psychology text books until the 1990s.

The concept of executive functioning came largely from studying adults who had acquired brain injuries specifically to the frontal lobes of their brains (Garcia-Barrera, 2019). Since then, executive functioning difficulties have been recognised as something that can occur developmentally, as well as through injury to the brain (Shanmugan and Satterthwaite, 2016).

One of the earliest definitions of EF comes from Lezak (1982, p. 281): "The capacities for formulating goals, planning, and carrying out plans effectively." Anderson (2001, p. 119) included the biological underpinnings of EF when she wrote: "Executive functions may be defined as those skills necessary for purposeful, goal-directed activity, and are generally considered to be largely mediated by the frontal and prefrontal cortices of the brain." More recently, a review of the literature by Baggetta and Alexander (2016, p. 24) yielded the following convergence in how EF is described: "Executive function is a set of cognitive functions that: (1) guides action and behaviors essential to aspects of learning and everyday human performance tasks; (2)

contributes to the monitoring or regulation of such tasks; and (3) pertains not only to the cognitive domain, but also socioemotional and behavioral domains of human performance."

All these definitions lack specificity and could cover a multitude of skills. There is no firm agreement about what is and is not counted as an executive function. However, the overarching concept is that executive functions are the skills which allow and enable goal-directed behaviour. Executive functions, subserved by the frontal lobes of the brain, co-ordinate more domain-specific and well-rehearsed skills (e.g., language, movement and reasoning), enabling us to adapt our behaviour to new or changing situations.

Key areas of executive functioning

One way to think about executive functioning is to consider it as a unitary concept, similar to Spearman's G, or general intelligence factor. There is a high correlation between different facets of executive function, so if a person is good at one aspect of EF, they are likely to be good at the others too. As with Spearman's G, executive functioning as a unitary construct is related to real-life outcomes such as school attainments, so it has predictive validity (e.g., Wray et al, 2020).

Within the umbrella of executive functioning, research has repeatedly found that people's performance splits into three core factors: shifting, inhibition and updating (Baggetta and Alexander, 2016; Miyake et al, 2000).

Shifting refers to cognitive flexibility; the ability to move from one type of task to another, and to shift your attention from one focus to another in pursuit of your goal rather than simply responding to stimuli. Shifting might be considered the opposite of perseveration, and this skill gives us the ability to change our behaviour in response to different task demands, changing goals, or alterations in the environment.

Inhibition is the ability to resist a prepotent response. At the opposite end of the scale would be impulsivity. Inhibition enables us to stop, think and respond rather than react. Classic tests of inhibition would include the Stroop test and the Marshmallow test, and in the real-world inhibition is required for all sorts of situations such as staying quiet in class rather than shouting out the answer, waiting until it is safe to cross the road, or choosing healthier eating options over more instantly attractive foods.

Updating means keeping in mind the information relevant to the situation and changing this information as needed for the changing situation. It is most aligned to the concept of working memory, in which we hold information and manipulate it as long as it is useful, and then forget it rather than store it in long-term memory. Long-term memory is not usually considered to be included within the umbrella of executive functioning. Updating requires continuous monitoring of the situation, so there are elements of attention as

well as working memory itself, for example to remember instructions long enough to follow them, or to hold a sentence in mind long enough to write it down.

Diagnostic labels

There are many diagnoses in which EF in general is often part of the presentation, for example acquired brain injuries (Beauchamp and Anderson, 2013), developmental trauma (Op den Kelder et al., 2018) and attachment difficulties (Reguiro et al., 2020). These conditions involve interruptions to the development of the prefrontal cortex and its connections to the rest of the brain, so a range of executive functions are likely to be affected.

Thinking specifically about the three core areas within executive functioning, they map on closely to three diagnostic labels: autism, ADHD and specific learning difficulties (American Psychiatric Association, 2022). Inhibition is a core problem for people diagnosed with ADHD, shifting relates to the inflexible thinking, which is a key feature of autism, and updating, or working memory, is so often part of the profile for children with specific learning difficulties like dyslexia and dyscalculia.

Of course, executive functioning levels tend to co-vary, so often if a person struggles with one area, they might also find the others difficult. This is a key reason why there is often a high comorbidity of these conditions, for example a higher likelihood of being diagnosed with ADHD if there is already a diagnosis of autism.

Whatever your views on labelling and diagnosis, terms like ADHD, autism and dyslexia are widely used in society and anyone working in education will come across them. There is debate over the validity and utility of such labels, however in this article we will focus upon the links between diagnostic criteria as they are already set out, and executive functioning.

Inhibition and ADHD

ADHD is a medical diagnosis, being listed in the Diagnostic and Statistical Manual (DSM) used by psychiatrists worldwide (American Psychiatric Association, 2022). The criteria in the latest 5th edition of the DSM for children 16 and under are at least 5 symptoms of inattention or at least 5 symptoms of hyperactivity or impulsivity. Clearly, inhibition links directly to one of the DSM 5 criteria for ADHD; symptoms of hyperactivity or impulsivity.

The inattention side of ADHD is less clearly linked to executive functioning. While some authors, such as Dawson and Guare (2018), see sustained attention as one of many EF skills, others place attention

separately from executive functioning. In Russell Barkley's (1997) influential model of ADHD, he suggests that the attentional problems seen in children with ADHD are secondary symptoms; they are a consequence of poor inhibition. This might explain why many children with a diagnosis of ADHD are able to sustain attention well on tasks which they find engaging and stimulating; it is the self-regulation they find hard, not the sustaining of attention in itself.

Developmentally, inhibition comes first, before sustained attention and the ability to resist distractions (Best and Miller, 2010), so it is perhaps not surprising that inhibition might be considered as a core executive function and the primary problem in ADHD.

What about the other two key aspects of executive function with respect to ADHD? Updating, or working memory, is often found to be weak in children with an ADHD diagnosis but the research would suggest that their performance on working memory tasks is affected by the problems with inhibition and attention, rather than working memory being a deficit in itself. Barkley's (1997) model has working memory as one of several systems which are not able to operate as effectively when inhibition is not developing in a typical way. Wodka and colleagues (2007) showed that increasing the working memory load in a response inhibition task did lower scores for children with ADHD, but it did for children without ADHD too. So, while a child may get weak scores on a test of working memory, the suggestion is that if the inhibition could be improved, you would see better performance on working memory as it is not itself impaired. This is why context is so important – in a busy, high stimulus environment, the child may appear forgetful, but if the environment is structured to reduce distractions and increase motivation, the child may be able to hold information in mind better.

With regard to flexibility, the evidence is mixed. Irwin et al. (2019) found that the apparent deficit in flexibility for children with ADHD was accounted for by a problem with inhibition. The children learned one rule and then struggled to shift to another rule, not because they could not think flexibly but because the first rule became the prepotent response, which was hard for them to inhibit.

It therefore seems that ADHD is specifically related to the inhibition aspect of executive functioning.

Flexibility and autism

Both the International Classification of Diseases (World Health Organisation, 2019), and the Diagnostic and Statistical Manual (5th Edition, American Psychiatric Association, 2022), include two key parts to the symptoms of autism. These are difficulties with social interactions, and repetitive, restricted patterns of interests and activities. In the DSM, these two key areas are considered separate enough that there is

a different diagnostic label, "social communication disorder," (p.47) for people who struggle with social communication but do not show the repetitiveness in their behaviours. Indeed, Happe (2006) proposed that there is no single underlying explanation or cause for autism, and instead the core areas are best considered as separate issues which often co-occur.

Hill (2004) argues that the key contribution of executive functioning to autism spectrum is in this area of mental flexibility. Repetitive behaviours, the need for sameness and difficulties with generalising knowledge across different examples or contexts are all ways in which inflexibility may manifest. The social communication issues may be better explained by other underlying concepts such as theory of mind as set out by Frith and Frith (2005), or the systematising/ empathising dimensions suggested by Simon Baron-Cohen (2009). The other two main areas of EF, inhibition and working memory may or may not be impacted in a child who has autism.

Updating and specific learning difficulties

While inhibition and flexibility can quite clearly be linked to the symptoms of ADHD and autism respectively, the updating (also referred to as working memory) element of executive functions is less obviously related to a specific diagnosis. There is no specific name to describe a condition primarily characterized by weak working memory. Of course, we do find people with specific difficulties in working memory functioning, either alone or in combination with other cognitive problems. Susan Gathercole's work (e.g., Gathercole, Lamont and Alloway, 2006) is a great source of information in this area, bringing theory and research to bear on practical strategies for helping children who have weak working memory.

Probably the most obvious diagnostic label where working memory is often a contributing factor is specific learning difficulties – or specific learning disorder as it is termed in the DSM-5 (American Psychiatric Association, 2022). Of course, the primary feature in this label is that the person has not acquired a particular academic skill such as reading, spelling or calculation, to the fluency expected of their age group, despite appropriate instruction. This descriptor has nothing to do with working memory, or any other executive function. However, meta-analytic studies (Peng and Fuchs, 2016; Swanson, Zheng and Jerman, 2009) show that as a group, children with specific learning difficulties do show significantly lower scores on working memory tasks than children whose literacy and numeracy skills are age-appropriate. There will, of course, be individual children who meet the criteria for dyslexia or dyscalculia and who have perfectly good working memory.

Dyslexia has become rather an umbrella term for any situation where the learner has not developed fluent and accurate reading, writing or spelling skills, despite appropriate teaching (Reason et al., 1999). There might be lots of different reasons why someone finds it hard to develop fluent literacy.

If the problem is with visual aspects, then working memory is less likely to be a key part of the formulation as the text is there all the time and how the words look does not need to be recalled. Instead, when the text is there in front of the student, a visual issue is more likely to be with other skills such as spatial orientation, visual discrimination or long-term visual memory. Indeed, Jeffries and Everatt (2004) found that children with dyslexia performed just as well as children with no identified learning needs on a test of visual working memory.

However, if the difficulties include auditory aspects of literacy, then working memory is likely to have an impact. It may be that the person struggles with auditory discrimination or vocabulary, in which case working memory may be less relevant. But poor auditory working memory can be an important underlying reason for the person's difficulties with literacy. If, for example, the person has learned to associate the written letters with their sounds, but struggles to blend them together, it may well be because they cannot hold the sounds in working memory long enough to manipulate the information into a word. This is because our long-term associative memory is subserved by completely different neural networks than our working memory, hence it is possible to learn letter-sound correspondences but struggle to blend them.

Similarly, when learning to spell, children must be able to break apart the word sounds and hold this information in their mind while then focusing on letter formation.

If reading is developed, it is often arduous and less fluent, meaning much more attention is focused on word reading than being able to gain comprehension from the text. Poor working memory might also mean that they find it hard to understand sentences or passages because they have forgotten the first part by the time they get to the end.

Many key reviews of good practice in dyslexia, such as the Rose Report (2009), acknowledge the likelihood of working memory difficulties as part of the constellation of issues for a person who is having literacy difficulties. This report acknowledges that literacy difficulties are the key criterion, and that difficulties such as working memory are more likely but not seen in all children struggling with learning to read and/or write.

So, while the overlap between working memory and dyslexia may not be as large as for inhibition and ADHD, or flexibility and autism, there will be a subset of people with dyslexia where working memory is responsible for at least some of their literacy difficulties. This subset is large enough that, at a group level,

differences can be found between people with and without dyslexia in their auditory working memory performance and the frontal lobe activity that subserves working memory (Beneventi et al., 2010).

Turning now to dyscalculia, in younger children, Menon's (2016) review of the evidence would suggest that both verbal and visual working memory contribute to the development of maths skills such as counting (identifying the number of items), subitising (knowing how many items from looking, without individually counting them) and arithmetic (mental operations like addition). However, from around the age of 7 to 9, visual-spatial working memory has greater influence on maths performance. This is because the earlier maths skills can be mediated much more easily by language (like rote counting, number word learning, mathematical language like "subtract"), whereas the more complex maths skills rely upon the language aspects being mastered into long-term memory, so the working memory load is upon visualisation and spatial concepts such as number lines. Expert mathematicians "see" the solution and use visual representations to solve maths problems more often than people who are less able at maths (Stylianou and Silver, 2004).

Of course, dyscalculia is not likely to be explained solely by poor visual working memory. Other core aspects of dyscalculia are also important, like the ability to subitise – seeing how many items there are without having to count them individually (Butterworth, Varma and Laurillard, 2011). This is sometimes referred to as, "number sense."

While the key criterion for dyslexia and dyscalculia will always be performance in reading, spelling and maths despite appropriate learning opportunities, it is likely that many children with these difficulties will have working memory issues as part of their presentation. It may well be worth assessing verbal and visual working memory, and considering what strategies may be useful to support working memory difficulties as well as directly supporting the academic skill learning.

Conclusion

Executive functioning has strong overlaps with a number of diagnostic labels. Conditions such as acquired brain injury (Babikian et al., 2015) and developmental trauma (Kirke-Smith, Henry and Messer, 2016) are likely to affect all executive skills, as they are associated with disruption to the overall functioning of the frontal lobes of the brain. More specifically, the three key areas of EF are related strongly to particular diagnoses: inhibition with ADHD; flexibility with autism and updating with specific learning difficulties. The overlaps are represented visually in Figure 1.

Figure 1: Relationships between aspects of EF and specific diagnoses
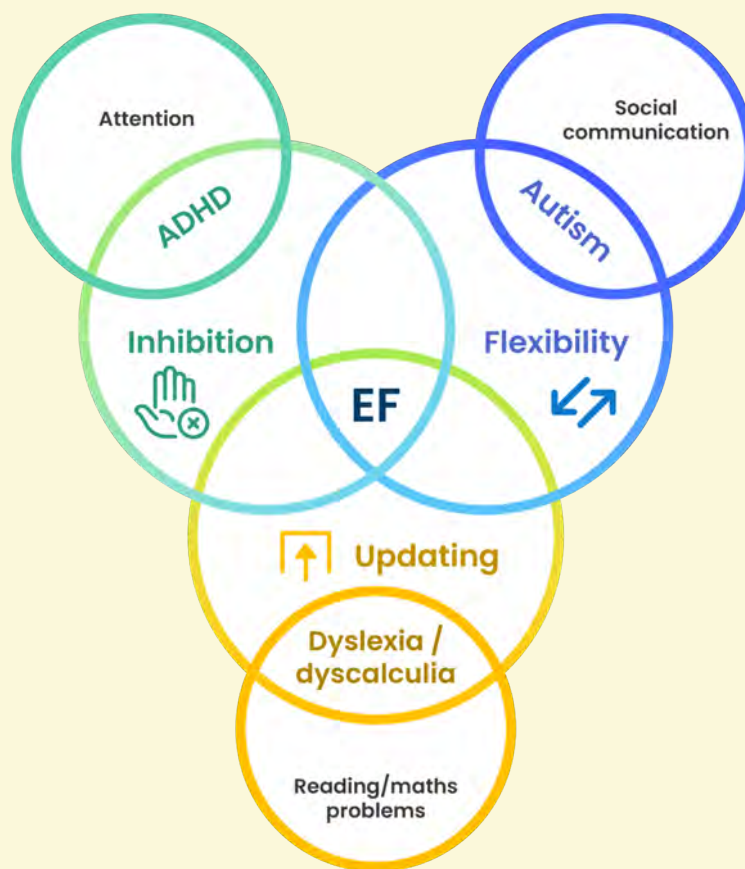
In order to work EF into a holistic formulation, practitioners may use a range of techniques to assess executive functioning including structured observations, consultation with the child and those who know him or her well, questionnaires and targeted testing.

Before implementing any intervention, it is useful to consider physiological and emotional needs as the underpinnings of cognitive development. For example, children may need support to get sufficient sleep, exercise, or nutrition. There may be important work to do around building secure relationships and self-esteem. Without these basics in place, academic interventions may be of limited use.

If the young person is in a position to benefit from intervention at a cognitive level, it may take two broad forms: compensation and remediation. Compensation involves altering the physical, curriculum or support environment in order to help the student work around their difficulties. Remediation needs to be tailored to train the specific skills assessed as being delayed, using the available evidence base and monitoring the student's response to intervention to check for efficacy. Perhaps we might move towards group, class or

whole school approaches to improving children's executive functioning, which holds the possibility of fewer students needing to be identified as individuals with difficulties.

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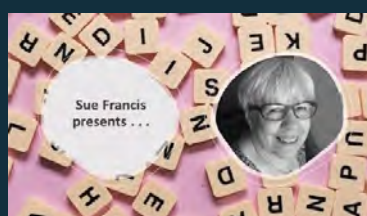Denise Drinkwater presents . . . Fintan O'Regan presents . . . Helen Driver presents . . . Liz Horobin & Sarah Reay present . . .

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Assessing writing skills in Higher Education: speed, legibility, and quality

Stuart, N.J.[a] & Barnett, A.L[a]*

Abstract

Writing and transcription skills (handwriting and typing) are critical throughout education and in employment. The use of robust assessment tools contributes to the identification of and support for individuals with writing and transcription difficulties. In this paper we outline practical ways to assess the speed and legibility of handwriting and to evaluate written composition skills. Application of the DASH17+, Handwriting Legibility Scale and Writing Quality Scale with scripts from 17-25 year olds are examined. The presentation of two case studies illustrates how this suite of tools provide a practical and holistic assessment of writing and transcription, useful for intervention planning.

Key words: Handwriting, Typing, DASH17+, HLS, WQS, Dyslexia

1. Introduction

Writing is an important tool for communication and a significant amount of time is spent in education in teaching writing skills. The 'Simple View of writing' (Berninger & Amtmann, 2003) provides a useful framework for understanding the language, cognitive and motor processes that are involved in writing and how they interact. The 'Simple View of Writing' framework has been developed based on research with English speaking children in primary and early secondary school. This framework conceptualises the

writing process as consisting of two primary components: transcription skills and text generation skills. Transcription skills refer to the processes needed to represent sounds as written symbols and includes handwriting (and typing) and spelling. Text generation refers to the organisation of ideas into words, sentences, and paragraphs to produce the written text or discourse. There is also a third component that involves Executive Function skills which are needed for planning, monitoring, reviewing, and editing what has been written. Each of these three components are supported by working memory.

The 'Simple View of Writing' framework helps us understand both the component skills involved in writing and the relative contribution of each during development. For the young child learning to write, transcription (i.e., the physical formation of letters to form words on the page) will take up much of the available working memory resources and capacity. In terms of text generation, young children are found to focus more on writing what they know about a topic, with very limited involvement from higher level Executive Functions skills such as planning and revising (Graham et al., 2007). As children get older and transcription skills become more automatic and the cognitive load of the lower-level transcription skills involved in writing decreases, Executive Functions skills begin to play a larger role in the writing process. Young writers will therefore start to move towards a knowledge-transforming strategy and, as they use more higher-level Executive Function skills, they will be able to focus more on text generation and the global structure of the text, resulting in a greater overall coherence (Berninger & Amtmann, 2003; Sumner et al., 2016).

In terms of handwriting, there are two elements that can be examined: fluency or speed and legibility. Fluency or speed refers to how quickly students can write and is usually measured as the number of letters or words produced in a specific time period and on differing tasks (e.g., copying or free writing). Legibility is more difficult to define but is generally linked to the 'readability' of the writing as a whole and the ease with which the individual letters and/or words are recognized (Rosenblum et al., 2004).

However, successful writing involves not only mastery of the lower-level transcription skills but also the skills involved in text generation that are required to produce a coherent and cohesive text. This will include not only the way in which ideas are developed and structured, but the appropriateness and variety of the vocabulary chosen to express those ideas, and the production of sentences that follow the standard conventions or 'rules' of English, including the correct use of punctuation. As children move through education, their vocabulary increases and their knowledge of how to use language to effectively communicate their intended message in different contexts and to different audiences develops.

For most students in Higher Education (HE) writing skills will be secure but for some students the writing process continues to be a challenge, with difficulties experienced in transcription and/or in the composition

and quality of the writing. For example, difficulties in the accuracy and fluency of writing letters or spelling words (transcription skills) can interfere with the higher order Executive Function skills required for the planning and generation of extended text. Oral language skills may also interfere or constrain the ability to transcribe ideas and thoughts into written text (at the text generation level). In 2021-22 students with specific learning difficulties (SpLDs) accounted for 6.15% of the HE student population in the UK and for 33% of the student population with a known disability (Higher Education Statistics Authority, 2022). As part of an assessment for SpLDs, identification of difficulties in writing is key to ensuring equal opportunity and it is important that appropriate adjustments are put in place for students in HE to ensure they are not disadvantaged compared to their peers.

An increase in the use of technology (i.e., personal computers, laptops, tablets) in schools and colleges has resulted in a reduction in the need for, and practice of, handwriting. In HE most coursework is now typed and submitted electronically. However, assessment via a handwritten examination, where there is a requirement to produce legible writing at a reasonable speed and to do so under time pressure is still used as a method of assessment. For students with difficulties with handwriting speed and/or legibility performance in exams can be affected. For example, handwriting fluency has been found to constrain overall performance in undergraduate examinations (Connelly et al., 2005) for students with slower handwriting fluency. In addition, handwriting legibility has also been found to affect how college student essays were evaluated, with more legible writing being evaluated more positively than less legible material (Greifeneder et al., 2010).

To identify and recommend appropriate support, at the time of writing, the current SpLD Assessment Standards Committee (SASC) guidelines for a 'Post 16 Diagnostic Assessment Report for SpLDs' (SASC, May 2022) include the following guidance for assessing writing and typing skills:

> *"A free writing task appropriate to the level of study / work, should be given and analysed, to provide information about qualitative features such as grammar, sentence complexity, coherence, vocabulary choice, spelling accuracy, writing speed and handwriting legibility. Pertinent aspects only of writing performance should be reported and should be related to the relevant educational / work environment and to the SpLD(s).*

> *A copying task should also be given so that difficulties relating to motor skills and the process of composition can be teased apart.*

> *It might be relevant to sample typing speed and accuracy."*

This guidance highlights the importance of not just handwriting speed and legibility, but also the compositional aspects of writing: grammar, sentence complexity, coherence, vocabulary and spelling accuracy. However, the availability of standardised tests for assessing writing skills in HE students is limited. The standardised DASH17+ (recommended by SASC) allows the assessment of handwriting speed in 17-25 year olds. The Wechsler Individual Achievement Test, Third UK Edition (WIAT-III[UK], Wechsler, 2017) allows for a more comprehensive assessment of essay composition writing skills but requires another sample of free writing on a different topic to that used in the DASH17+. To our knowledge there are no other tools that are both quick and easy to use, that allow for assessment of writing legibility and quality in this age group.

Aim:

The aim of the current study was to examine whether the DASH17+ and two newly developed criterion referenced tools, the Handwriting Legibility Scale (HLS; Barnett et al., 2018) and Writing Quality Scale (WQS; Stuart & Barnett, 2023) could distinguish between a group with and without dyslexia in HE. Two case studies are also presented to illustrate how information from the three assessment tools could provide information to help in the identification and recommendation of support for students with difficulties.

2. Method

2.1 Participants

Twenty-eight students (11 male, 17 female) with a mean age of 19 years and reported to have dyslexia by the students themselves and by their dyslexic support tutors, were matched to an age and gender comparison group (see Table 1). These students were selected from the UK stratified sample for the DASH17+ and were selected from a range of schools, colleges, and universities across the UK, including England, Scotland, Wales, and Northern Ireland. (See Stuart & Barnett, 2023 for further details).

	Male	Female	Total
17-18 years	8	7	15
19-21 years	3	9	12
22-25 years	0	1	1
Total	**11**	**17**	**28**

2.2 Measures

The following three tests were used to measure handwriting speed, legibility and writing quality.

2.2.1 Detailed Assessment of Speed of Handwriting (DASH17+; Barnett et al., 2010)

The DASH 17+ includes four main tasks to measure speed of handwriting production: two sentence copying tasks which allow a comparison to be made between 'best' and 'fast' handwriting, alphabet writing and a 10-minute free writing task, in which students are required to write on the topic of 'My Life'.

2.2.2 The Handwriting Legibility Scale (HLS; Barnett et al., 2018)

The Handwriting Legibility Scale was designed to be a quick and practical tool that could be administered in conjunction with the free writing task in the DASH (Barnett et al., 2007) to measure handwriting legibility. The HLS involves the assessment of handwriting using five criteria (see Table 2) that have been linked to legibility.

Table 2

HLS Criteria

Criteria	Brief description
1 Global legibility	Based on a first reading of the text, how legible are all the words in the text.
2 Effort	Ease of reading on a first attempt, considering the effort required to read the script.
3 Layout	Organisation of the writing and consistency of the alignment of the writing with the margin, the spacing between and within words, the position of the letters and words on the baseline.
4 Letter formation	The shape, size, and slope of the letters and whether they contain all the necessary elements.
5 Alterations	Alterations to individual letters such as re-tracing or over-writing of letter.

The scores for the five criteria are each rated on a five-point scale and summed to give a total score (ranging from 5-25) with higher scores reflecting poor legibility. The total scores can also be categorised into low (5-10), medium (11-15) and high (16-25) scores, with those falling in the high category indicating that the writing has poor legibility and may require further attention and possibly support.

The development of the HLS was initially for use with primary and early secondary school aged children (ages 8-14 years). Reliability has been reported as good and the HLS has been found to be sensitive to gender differences and to identify students with SpLDs / Developmental Coordination Disorder (DCD) (Barnett et al., 2018). It has subsequently been translated and applied to other languages, including Hebrew (Fogel et al., 2022) and Czech (Safarova, 2023) and also applied to older age groups (14-16 years and 17-25 years) in the UK (Barnett & Stuart, 2023).

2.2.3 The Writing Quality Scale (WQS; Stuart & Barnett, 2023)

The WQS was developed for use with 17–25-year-olds in HE and designed for use with the DASH17+ free writing task. It has six criteria (see Table 3), with each criterion given a score between 1 and 4. These scores are then summed to yield a total score (ranging from 6-24) with higher scores indicating poor writing quality. In addition, once the overall WQS score has been calculated, a cut-off score was established to help the assessor in identifying poor writing quality performance. This then allowed for the identification of whether a script fell into the high (indicating poor writing quality scores of 17-24), medium (scores of 13-16) or low category (scores of 6-12).

Table 3
WQS Criteria

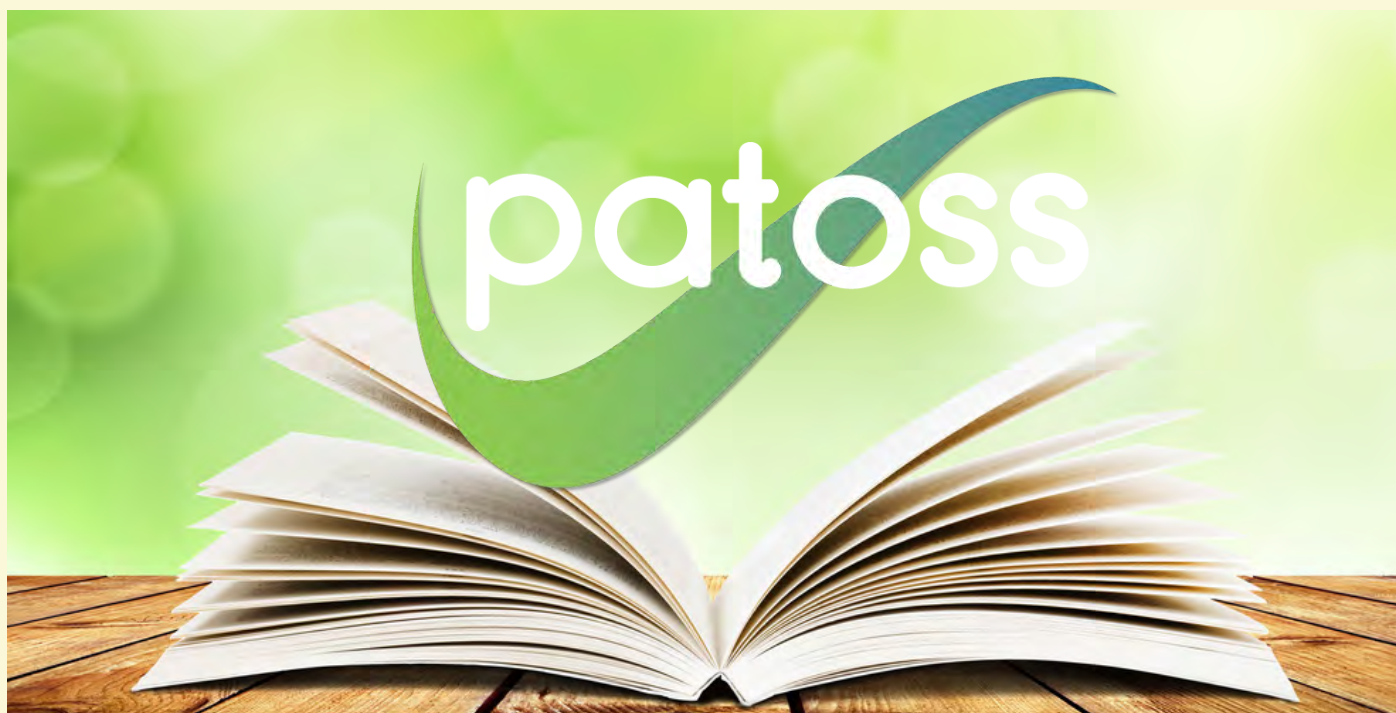|	Dyslexia		Age & Gender		p	Cohen's d
	n = 28		n = 28			
	Mean	SD	Mean	SD		
Speed (DASH17+) raw scores:						
Copy Best (words per minute)	22.50	7.47	26.09	4.68	0.036	0.58
Copy Fast (words per minute)	31.45	7.09	35.21	5.13	0.027	0.61
Copy difference	8.95	4.48	9.13	3.83	0.873	0.04
Alphabet writing (letters per minute)	66.96	24.50	88.68	19.65	<.001	0.98
Free Writing (words per minute)	23.14	6.33	26.13	4.47	0.046	0.55
DASH17+ Standard Score	90.68	17.29	103.54	12.28	0.002	0.86
Min-Max	63-127		79-125			
Legibility: HLS Total	11.14	3.21	9.61	2.33	0.045	0.55
Min-Max	6-17		6-16			
Quality: WQS Total	16.89	3.48	14.43	2.52	0.004	0.81
Min-Max	10-23		11-19			
Low Scores (6-12) % Scripts	14%		28%			
Medium Scores (13-16) % Scripts	36%		54%			
High Scores (17-24) % Scripts	50%		18%			

2.3 Procedure

The DASH17+ was administered and scored in accordance with the Manual. The DASH17+ 'free writing' task was also used for scoring legibility (using the HLS) and writing quality (using the WQS). Prior to scoring the scripts for quality using the WQS, the DASH17+ free writing scripts were transcribed and typed up (preserving spelling errors, crossed out words and noting where words were illegible) to reduce bias in scoring from poor handwriting (Graham & Weintraub, 1996; Greifeneder et al., 2010). A trained rater, blind to whether students had an SpLD or not, scored the HLS and WQS for all scripts, as part of a large sample of scripts (reported in Stuart & Barnett, 2023).

3 Results

Results from the DASH17+, HLS and WQS are reported below for the group of students with dyslexia and their age and gender matched peers. We then present two case studies of students with dyslexia.

3.1 Group scores: Students with dyslexia and their age/gender matched peers

The group scores for the three assessment tools are shown in Table 4. Significant group differences were found on all the DASH17+ tasks with the group with dyslexia producing fewer words and letters per minute than their age and gender matched peers. On the sentence copying tasks, both groups were able to speed up on the 'copy fast' task and there was a significant effect of condition (copy best, copy fast): $F_{(1,54)} = 262.94$, $p < .0001$, and of group (dyslexia, age/gender): $F_{(1,54)} = 5.53$, $p = .002$. However, no significant interaction between group and the copying condition was found $F_{(1,54)} = 0.02$, $p = 0.873$.

Table 4

Comparison of DASH17+, HLS and WQS scores for group with Dyslexia and their age and gender matched group

	Dyslexia		Age & Gender		p	Cohen's d
	n = 28		n = 28			
	Mean	SD	Mean	SD		
Speed (DASH17+) raw scores:						
Copy Best (words per minute)	**22.50**	*7.47*	**26.09**	*4.68*	**0.036**	0.58
Copy Fast (words per minute)	**31.45**	*7.09*	**35.21**	*5.13*	**0.027**	0.61
Copy difference	8.95	*4.48*	9.13	*3.83*	0.873	0.04
Alphabet writing (letters per minute)	**66.96**	*24.50*	**88.68**	*19.65*	**<.001**	0.98
Free Writing (words per minute)	**23.14**	*6.33*	**26.13**	*4.47*	**0.046**	0.55
DASH17+ Standard Score	**90.68**	*17.29*	**103.54**	*12.28*	**0.002**	0.86
Min-Max	63-127		79-125			
Legibility: HLS Total	**11.14**	*3.21*	**9.61**	*2.33*	**0.045**	0.55
Min-Max	6-17		6-16			
Quality: WQS Total	**16.89**	*3.48*	**14.43**	*2.52*	**0.004**	0.81
Min-Max	10-23		11-19			
Low Scores (6-12) % Scripts	14%		28%			
Medium Scores (13-16) % Scripts	36%		54%			
High Scores (17-24) % Scripts	50%		18%			

The scores for the HLS and WQS are also significantly higher in the group with Dyslexia, indicating poorer performance. As a group, the students with dyslexia showed slower writing speed, poorer legibility and poorer quality in writing than their age and gender matched peers. These differences were significant (at or below p =.05) with medium (d= 0.50) to large (d =0.80) effect sizes. The medium to large effect sizes found on each of the tasks indicate that the differences between the groups were substantial and meaningful, with the DASH17+, alphabet writing and WQS Total score producing large effect sizes.

3.2 Case Studies

In this section we report on two male students taken from the group with dyslexia and examine in more detail their individual scores for the DASH17+, HLS and WQS (see Table 5).

	Student 1		Student 2	
	Male 20 years		Male 18 Years	
	Raw	SS	Raw	SS
Speed (DASH17+)				
Copy Best (words per minute)	30.50	12.00	10.00	3.00
Copy Fast (words per minute)	34.50	10.00	15.00	3.00
Alphabet writing (letters per minute)	62.00	7.00	52.00	7.00
Free Writing (words per minute)	31.80	14.00	12.40	4.00
DASH17+ Standard Score		103.00		64.00
95% Confidence Interval		91-115		52-76
HLS Total (higher score = poor performance)	**17 (high)**		**16 (high)**	
WQS Total (higher score = poor performance)	**18 (high)**		**21 (high)**	

The overall total standard score in Table 5 for the DASH17+ for both students differ. Student 1 has a score of 103 (CI: 91-115) which is in the average range expected for his age, whilst Student 2 has a score of 64 (CI: 52-76) which is below the average range expected for age.

For Student 1, if only the DASH17+ was administered and speed of writing considered, then the conclusion might be that the student had no difficulties with handwriting. All scores for Student 1 are in the average range and when scoring the 'free writing' script for speed, only one word was discounted for being completely illegible. However, some issues with the legibility of the writing were evident on scoring the DASH17+ tasks and the total HLS score for the DASH17+ free writing script confirmed this, placing Student 1 in the 'high' range, indicating issues with the ease of reading and aspects of letter formation. The script is difficult and effortful to read (see sample of writing in Figure 1). Some of the letter formation is poor and placement of letters on the baseline is variable. For example, the 'h' in 'with' lacks a clear ascender, the 'y' of 'happy' sits on the baseline without a descender below the line. Some other letters 'float' above the line, are poorly formed or have missing parts. This all makes it harder work for the reader, and one has to rely on context to make out some of the words.

In terms of the quality of the writing, the content and development of material is good, and the student demonstrates they are able to extend and elaborate material. However, their overall WQS score is affected by their limited range of vocabulary and errors in constructing sentences and the correct use of punctuation. Whilst the meaning of what has been written can still be understood, this may become more of a challenge when required to write more academic assignments.

My Life

My life is amazing, no really it is. Im very happy with my life and I take things for granted way to much. I should be in lesson now but im not ... no Im in a room writing my thought down on a bit of paper but heh I get paid so why not ever since I left high school I just cant write. I don't know why but already my ~~had~~ hand is hur//ting their fore my hand writing is awful. in my life I enjoy lots of music and my favourite ~~do~~ band is Blink 182.

In summary for Student 1, whilst handwriting speed was adequate, further examination of the legibility of the writing using the HLS and the compositional quality of writing using the WQS reveals significant difficulties that might impact on this student's studies.

In contrast, Student 2's overall total standard score of 64 for the DASH17+ is in the below average range expected for age. Handwriting speed on all the individual DASH17+ tasks was slow for the student with the exception of the alphabet writing task where the student's score fell in the average range. When scoring the 'free writing' script for speed, although some issues with legibility were noted, all words could be read and so were counted. However, examination of scores on the HLS show that, although the work can be read in context, it has received a total HLS score in the 'high' category, indicating issues with the ease of reading and aspects of letter formation. Some letters are inconsistently placed on the baseline (e.g., some 'y' and 'g' letters do not have a descender below the line). There is also inconsistency in the spacing of letters within words, with gaps in some places and letters too close together in others.

My Life*

This is abou t my life well my life is ~~wl~~ always busy iam 18 years old (19 in less than a mounth) I am studying at ███████ ████████████, // where I am taking a Btec natinol diploma inperforming arts. I also have as trong passion for technical theatre a // and that is something I wish to study at university or at a drama school. I am also ~~st~~ puting on my own show in college this show will be // the Rocky horror picture show which i plan to put on in ██████████. I have also taken part in a // cross college (people who don't just study performing arts) which has a prodution ~~manager~~ of les misérable which was a huge sucsess

The free writing script produced is very short compared with those produced by the age and gender matched peers (and with Student 1). In describing their life, the student focuses on what they are studying

and their plans for the future, but it is 'list like' and content is not elaborated. The text lacks structure and whilst appropriate words are selected to convey meaning, the vocabulary used is limited in range. The sentences are simple in structure and alternate between sentences starting with I am ... and I have … which add to the 'list like' feel of the text. Lack of appropriate punctuation also impacts on the meaning and coherence of what is written, and the use of capital letters is also inconsistent. The text contains several spelling errors consisting of letter reversals, omissions, or additions.

4 Discussion

Difficulties with writing extend beyond the school ages and can emerge later in life when the demands of independent study and writing to specified word counts and deadlines and /or writing under timed conditions become more challenging. There is evidence that in HE, writing speed and legibility can constrain performance in undergraduate examinations (Connelly et al., 2005) and that poor legibility can result in lower marking evaluations (Greifeneder et al., 2010). Assessment of both speed and legibility are therefore important to ensure that students with handwriting difficulties are offered effective support to avoid academic underachievement.

In response to a lack of suitable assessments and requests from PATOSS members for some additional guidance on how to go about assessing writing skills in students in HE, we developed two criterion referenced tools; the Handwriting Legibility Scale (HLS; Barnett et al., 2018) and the Writing Quality Scale (WQS; Stuart & Barnett, 2023). Both tools were designed to not require additional tasks to be administered in an assessment for SpLDs and to make best use of information already typically collected through using the SASC recommended test for assessing handwriting speed, the DASH17+. Thus, handwriting legibility can be more systematically explored through using the HLS on the free writing scripts from the DASH17+. In the same way, having assessed the free writing script for legibility, it can then be assessed for its written compositional quality using the WQS.

The comparison between a group of students with self-reported dyslexia and their age and gender matched peers demonstrated that both the HLS and WQS criterion referenced tools were sensitive enough to differentiate the group of students with dyslexia in terms of their poor handwriting legibility and written compositional quality of their free writing from their age and gender matched peers. Furthermore, the two case studies of students with dyslexia that were presented illustrated how the HLS and WQS can provide useful additional information to that collected on handwriting speed from the DASH17+ for assisting the

assessor in making recommendations for access arrangements and support. However, it is important to remember that individuals will vary, and the case study of Student 1 illustrates this in terms of the student's handwriting speed falling in the 'average' range but there being evidence of difficulties with legibility and compositional quality that may impact on their studies. Student 2 in contrast showed difficulties with speed, legibility and the compositional quality of their writing. In summary, the case studies illustrate how the HLS and WQS provide lots of additional information to better help the assessor to work out where particular difficulties may lie. In the limited space available here we have highlighted how the DASH17+, HLS and WQS can be used together to provide a holistic assessment. In practice, further detail from each of these tools can be examined, alongside other information available about the student, their course of study and the teaching and learning environment, to make decisions about how they can best be supported.

It is acknowledged that this paper has reported on a small sample of students with dyslexia and that groups of students with dyslexia are often heterogenous, in terms of the types of difficulties experienced and their severity, whether these difficulties extend to writing and whether they also have other co-occurring difficulties. This heterogeneity was seen in the range of scores achieved by the group of students with dyslexia for the three assessments tools.

4.1 Implications for professional practice

We have illustrated how two new tools can be used alongside existing information routinely collected as part of an SpLD assessment. Used together with the DASH17+, the HLS and WQS are quick and easy to apply and score. It is hoped that these new tools will be useful for assessors in their professional practice, by providing information to help understand and support those with writing difficulties.

Copies of the HLS and WQS score sheets and additional resources are freely available from the following website: annabarnett.co.uk

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The Dynamic Assessment of Reading Test (DART) Project

Hannah Nash

Abstract

The Dynamic Assessment of Reading Test (DART) Project began in 2019 and, despite two periods of significant disruption to schooling, was completed at the end of 2021. The aim of the project was to test the ability of dynamic assessments of reading related skills to predict growth in reading and identify children at risk of reading difficulties, as a potential addition or alternative to static screeners or assessments, particularly for children who may have had less opportunity to learn the foundation skills of reading in English. Our findings indicate the potential value of dynamic assessments of decoding and vocabulary learning for the identification of reading difficulties, along or in addition to existing tests, particularly for children who have EAL. Below is the executive summary taken from the report. You can read the report in full on the DART project website https://dart.leeds.ac.uk/findings/. If you have any questions, please contact Dr Hannah Nash h.nash@leeds.ac.uk.

Executive summary

Context

A quarter of children leave primary school without having achieved the expected standard in reading (Department for Education, 2022). It is crucial that we identify children at risk of reading difficulties early in their school experience, so that appropriate support can be put in place. Current screening practices involve assessing reading ability itself or related skills such as letter knowledge or vocabulary. However, these measures are static, assessing a child's existing knowledge, which is a product of their ability to learn and their experiences.

Opportunities to learn vary greatly between children; children from disadvantaged backgrounds or those for whom English is an additional language may have had less opportunity to learn the foundation skills of reading in English. Dynamic assessment (Grigorenko & Sternberg, 1998) offers a potentially fairer screening method, measuring a child's capacity to learn while completing a task. In systematic reviews of the existing literature we found that dynamic assessments of reading-related skills explained differences in children's reading growth even after accounting for variance associated with static measures (Dixon et

al., 2022b) and achieved good identification accuracy for later reading difficulties, when used alone or in combination with static measures (Dixon et al., 2022a). However, there was a lack of evidence from the UK context, for skills relating to reading comprehension and for children from diverse backgrounds.

Aim

Our systematic reviews of the literature identified the potential for using dynamic assessment in the screening process for reading difficulties. The overarching aim of the DART project was to create computerised dynamic assessments of learning, which if shown to be effective screeners, could be developed in future work as low-cost screeners for use in schools. The research was conducted in three work packages.

1.   Dynamic assessment of decoding with children in reception, focusing on early reading ability.

2.   Dynamic assessment of sight word learning with children in year three, focusing on the development of more skilled reading.

3.   Dynamic assessment of vocabulary learning with children in year four, focusing on reading comprehension.

Research Questions

1.   Do dynamic assessments correlate less strongly with socio-economic status and English language proficiency than static measures?

2.   Does learning in each of the dynamic assessments predict growth in reading ability over time?

3.   Can dynamic assessments accurately screen for later reading difficulties?

a.   How do they compare to static measures?

b.   Do they improve screening when added to static measures?

Method

Each work package used the same longitudinal design, with two assessment time points. Children were first assessed using a battery of static tests (to measure reading ability and traditional predictors of reading) and one dynamic assessment. At the second time only the reading ability tests needed for diagnostic classification were completed.

Key Findings

Performance on the dynamic assessments was only weakly to moderately correlated with socio-economic status and English language proficiency. The static measures were also only weakly to moderately correlated with socio-economic status but more strongly related to

English language proficiency. This suggests that our dynamic assessments offer a less biased approach to screening for the increasing number of children with English as an Additional Language (EAL) entering primary school.

All of our dynamic assessments predicted unique growth in reading ability after controlling for demographic factors and static tests:

1.   The dynamic assessment of decoding predicted growth in early word reading.

2.   The dynamic assessment of sight word learning predicted growth in reading accuracy and fluency.

3.   The dynamic assessment of vocabulary learning predicted growth in reading comprehension.

All of our dynamic assessments achieved excellent or outstanding levels of accuracy as screeners for later reading difficulties and two showed potential to add value to a battery of static tests for children with EAL (decoding and vocabulary learning). Data from a subsample of non-readers suggest that administering the decoding task earlier in the school year, as originally planned, could improve screening accuracy for all reception children.

Future Directions

The DART project has provided evidence of 'proof of concept'. We now need to work in partnership with educators to establish how dynamic assessments of decoding and vocabulary learning may fit within existing practices in schools and determine for what age group and when in the school year our dynamic assessments should be administered to maximise their value.

An additional cycle of participatory co-design work with children and educators is needed to refine the presentation and delivery of the dynamic assessments on an accessible, stable and low-cost platform, that would be suitable for use in schools.

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The impact of discourse and cultural norms on the emotional wellbeing of young people with severe dyslexic difficulties

Claire Durrant

Abstract

This article draws on sociological theory (Symbolic Interactionism and Foucault (Woodward, 2002)) to understand the factors influencing how young people respond emotionally to their severe dyslexic difficulties and explores what schools and teachers can do to alleviate feelings of difference, sadness and shame.

The research is situated within an education system that prioritises literacy and academic achievement and where children's differences are often treated as a deficit and as a 'problem' located within the child. The findings suggest that young people internalise these institutional discourses and cultural norms and, for those with severe dyslexic difficulties, often leads to them feeling shame and experiencing stigma. The research found several young people who tried to hide their additional needs at school, highlighting a tension between feeling marked out as different and the relief of having their needs acknowledged. Schools can address this tension by encouraging an ethos of neurodiversity and inclusivity and building a culture where difference is normalised and accepted. Teachers can also challenge institutional discourses around literacy and notions of deficit through their micro interactions with learners. Relationships between young people and their teachers were also highlighted as significant in terms of recognition (interaction, care, respect and validation), trust, empathy and sensitivity, as well as young people feeling listened to.

Key words: severe dyslexia; teachers; discourse; emotional wellbeing; young people

Glossary:

severe dyslexia: for the purposes of this study, dyslexia is a continuum. Parents attributed the term 'severe dyslexia' to their children on the basis of an assessment.

discourse: 'a group of statements which provide a language for talking about… a particular topic at a particular historical moment' (Hall, 1992, p. 291).

emotional wellbeing: 'the presence or absence of positive feelings about life' (Keyes, 2002, p. 208).

Introduction

After many years of advocating for and supporting my severely dyslexic son through mainstream education, I turned to academia to answer some of the many questions I had about why severe literacy difficulties had such a profoundly negative impact on his emotional wellbeing. With most existing studies focusing on the broader term 'dyslexia', I focused my PhD on the identity and emotions of young people with the most severe dyslexic difficulties. Having now completed my studies (Durrant, 2021) – a sociological study of what influences the emotional wellbeing of young people with severe dyslexic difficulties – this article draws out some of the key lessons.

At a time when government spending cuts have placed school budgets under severe pressure and the support of those with additional needs is causing the most stress on resources (National Association of Head teachers [NAHT], 2018), my research sought to understand what teachers can do, beyond educational interventions, to positively impact the emotional wellbeing of their students with severe dyslexic difficulties. Although there is a lack of existing research about people with severe dyslexic difficulties, a few academics have acknowledged a possible link between the severity of dyslexia and self-perception (Macdonald, 2009a) and, in societies where literacy is seen to be of importance, between severity and self-concept (Burden, 2008).

My research is framed by an understanding that people are labelled 'through the identification of the difficulties that have been imposed by social and educational barriers (assumptions, systems and expectations) mediated through social interactions' (Cooper, 2010, p. 11) and takes the focus off the classroom to include wider impacts on identity construction and emotional wellbeing. However, while the focus of this study was always to explore the wider, macro, influences on young people, it strongly supports previous studies (e.g., Snowling, 2013) suggesting that access to early, evidence-based intervention is an imperative for dyslexic learners because it interrupts feelings of shame that grow from the experience of exclusion and enables a sense of competence and hope about the future.

Although the research is outward looking in its approach it is also very much focused on the young people's lived experience. The research was collaborative and acknowledged the young people as agents able to operate creatively in and upon structure (Prout and James, 1990).

Methodology

This research draws on Symbolic Interactionism as a theoretical perspective, acknowledging that the difficulties associated with dyslexia are socially embedded. The research focuses on an interactive self

that constructs an identity through the interface between self and society, with emotions arising from social relations and socio-cultural processes. Cooley's (1902) concept of the 'looking-glass self' informs the research, highlighting how people interpret the reactions of others, with much of this process based on what we imagine they think of us (Cooley, 1902). Underpinning this is the work of Foucault who describes identity as fluid, historically specific and shaped through discourse (Woodward, 2002). From this perspective, emotional wellbeing is not simply a personal possession but is connected in important ways to the structure of society and the processes of culture and socialisation.

Given my role as the mother of a young person with severe dyslexic difficulties and therefore an insider researcher, it was important that I located myself in the research and was reflexive. This meant being open about the thoughts and emotions that the interviews generated and reporting on how they may have influenced my understanding of the research findings.

Research Design

The research was based on an online survey with 474 parents/carers of young people with dyslexic difficulties, plus narrative case studies with 15 young people (aged 10-19 who attended state, mainstream schools and whose parents identified them as having severe dyslexic difficulties) and their mothers living in England. Young people were interviewed face-to-face, in their own homes, using a discussion guide comprising open-ended questions, as well as a range of devices aimed at facilitating rich data - metaphors, relational maps, videos and vignettes. Mothers were asked to tell their child's story, in particular their child's time at school, including all the experiences and events that were important to them. Although the parents' brief was kept very open, they did not just relate a sequence of events but also conveyed information about how they occurred and the meanings they had. All research took place in 2018.

The families taking part in this study were either followers of the British Dyslexia Association Facebook page or part of the Operation Diversity Community on Facebook which means that they were already self-identifying (and self-organising) around dyslexia. This means that they were all aware of dyslexia and may have had some understanding of it and therefore cannot be assumed to represent the wider population.

Research Findings

The findings from the narrative case studies were filled with emotion, including a sense of shame felt by young people arising from their difficulties in accessing learning and from the stigma of struggling with literacy. The accounts of parents provided a powerful sense of the emotional toll of having severe literacy difficulties, revealing young people's shame-laden use of words such as 'stupid' and 'lazy' and their

experiences of sadness, depression, anger and frustration; young people also emphasised their lack of self-worth, using similar words to describe themselves. As the findings below illustrate, these emotions often arose from their interaction with others, in particular teachers, and their judgement of them.

Some participants were particularly lacking in hope and troubling to listen to. When young people were asked to imagine dyslexia as some kind of 'thing' or 'picture' in their mind, Harvey, 16 years old, described it as a dark character that is 'annoying' and 'gets in your way and all… just makes your life harder…'. Harvey's mother described her son as having very low self-esteem and as feeling 'a total failure', which she attributed to his dyslexic difficulties. Trevor, 14 years old, described dyslexia as 'life-changing' and likened it to a wall, which represented a barrier to accessing 'knowledge and everything you need and everything— everybody has'. His use of the words 'everything' and 'everybody' point to feelings of exclusion and the idea that the wall is stopping him from accessing vital information that everyone else has. His mother described why she deregistered him from school in Year 8:

> 'He had no way up and no one to aspire to. He was missing 1 or 2 days of school each week due to his anxiety. He cried all the time and he was so sad.' (Trevor's mother)

Arthur, 17 years old, described how school made him 'upset', 'down' and made him talk of killing himself. His mother also described him as becoming increasingly withdrawn at secondary school and spoke of 'losing' him. Arthur alludes to being impacted by the words used by those around him in school:

> 'As a kid you don't really get depressed. You just sort of feel down instead and just like believe in what they tell you.' (Arthur, 17)

My research findings suggest that the way in which young people conceptualise difference may be significant for how they build their identity and perceive themselves. Several parents wrote in their narratives about their child's feelings of difference, describing this as something from which they wanted to defend their child. Most young people reflected on being separated from their peers because of their dyslexic difficulties, which seemed to reinforce their sense of otherness and isolation. Jack, 11 years old, talked about being treated differently to his peers, claiming that teachers talk to him as if he is 'little-minded' because he is in the learning support class:

> 'I get treated more like a 7-year-old and all my friends who are in the higher groups, they get treated more like a proper year 7.' (Jack, 11)

My research indicates that, in the context of school, young people experience a tension between being feeling marked out as different and the relief of having their difficulties acknowledged, often in the form of

a label. Arthur was very clear that he spent the whole of his time at school trying to cover up his difficulties and therefore would not draw attention to himself by asking for help:

> 'I mean I went through the entire education system… because I was afraid if I speak, if I spoke up and asked for something, I would be different from everyone else.' (Arthur, 17)

Ella, 12 years, also recounted how she is cautious about asking for help from teachers she did not know but was happy to share her difficulties with those she trusted and Gina, 18 years, said that she did not speak up until a particular SENCo made her realise she would be taken seriously. All of these findings illustrate the importance of trust, and that young people need to be sure they will be listened to before they speak up for themselves.

In thinking about living with difference, it is important to understand the influence of the people and institutions around the child. Riddick argues that feelings of stigma and shame about literacy difficulties occur even before a label is attached to people's difficulties (2000) because 'the notions of being "educated" and being "literate" have become inextricably bound together in many European cultures' (2001, p. 224). My research supports this and suggests that shame occurs because literacy difficulties bring young people into conflict with a social valuing of competence in reading and writing. In addition, the findings indicate that the young people taking part in the research attended schools where their additional needs were seen as a 'problem' located within the child, situating their differences within individual pathology and prioritising treatment of the 'deficit'. Donald (1983) discusses how dyslexia has been constructed through a medical model of disability and by an approach to education that venerates and endorses literacy as a social norm. Most schools in England operate within this discourse of deficit and a culture of literacy norms, which means that young people are increasingly subjected to an 'educational gaze', whereby they are measured and tested to assess deficit, and those who do not keep up can be segregated from their peers within mainstream settings.

My research suggests that young people internalise the discourse of deficit and the privileging of academic achievement and literacy, a situation that is endorsed by government regulations of schools in the form of testing and OFSTED league tables and the favouring of academic results over vocational qualifications. From a symbolic interactionist perspective and Cooley's (1902) concept of the 'looking-glass self', teachers have a significant role in modelling how their students perceive difference and themselves. If teachers display negative attitudes and behaviour towards young people with dyslexic difficulties, this can lead to them evaluating and self-categorising themselves on this basis and may also influence how their peers respond to them. Georgia, 19 years old, recognised the impact that one of her teachers, who she described as a bully, may have had on her relationship with her peers:

> 'Then she'd (the teacher) picked on me in front of the whole class because I didn't do it properly…
>
> So it was very much the class had an opinion of me due to the teacher (Georgia, 19)

Trevor spoke about being humiliated in front of his class because he did not finish his SATs paper in primary school. In the quotation below he talks emotionally about how his teacher singled him out when he returned from the separate room where he had taken the exam:

> 'He, um, he said, um, my name personally (clears throat) and then he said that he was told that I didn't try very hard and I didn't try my best and that I was not going to go anywhere if I didn't try.' (Trevor, 14)

Trevor described how upset this made him feel and how unfair he thought it was of the teacher to talk to him in this manner in front of the whole class:

> 'I just felt like crying, I just felt so upset…that he would say something like that to me.' (Trevor, 14)

The research therefore indicates that young people with severe dyslexic difficulties are dependent on those around them to help them to challenge the narrative that dyslexia is a deficit and difference is a negative. On this basis, it is important that schools and teachers confront this discourse, beginning to normalise difference and create more inclusive schools where neurodiversity is celebrated and valued by everyone.

So, what else can schools and teachers do to make a meaningful difference to young people? Drawing on the positive stories from the research about teachers and teaching assistants suggests that young people want recognition – what Houston (2010) terms interaction, care, respect and validation. The findings also reflect Laurent's (2013) research in which she highlights the significance of even the smallest acts of care by the adults at school and Lithari and Rogers' (2016) research about the importance of school being a 'care-full' space for children with SEND. Parents commented that individual teachers and teaching assistants can have a positive impact when they show empathy and are open-minded about learning difference:

> 'His SENCo was amazing!! Quiet and calm when needed and funny and motivating when needed. She focused on what he was good at…' (Parent, online survey)

Teachers with personal experience of dyslexia (either their own, a family member, friend or another learner) were described as especially understanding. This insight is supported by Sahin (2018), who suggests that teachers' previous experience of SEND has an impact on their attitude towards young people with learning differences. Adam's (13 years) mother described one of these teachers as someone her son could talk to

about how he was feeling, who met him at the school gate if he did not want to go into school and sorted out problems for him. She told me that this relationship helped to raise her son's self-esteem. Similarly, Todd, 12 years, spoke about one teacher in particular who also had dyslexic difficulties and who he valued for the support she offered:

> '…she takes me out of class and talks to me about things…Just about like dyslexia…and everything.' (Todd, 12 years)

However, teachers and teaching assistants do not necessarily require personal experience of dyslexia to recognise and care for young people. Gina praised a teacher who had no training in dyslexia but still showed compassion and stayed with her when she was upset about her schoolwork. Sid's (10 years) mother emphasised that teachers who do not have training can still form a good relationship with young people if they have an open-minded attitude to neuro-diversity and inclusion:

> 'He's had some teachers and TAs that have been fantastically supportive and even if they haven't had training, they are open-minded enough to accept that not everyone is the same….and he's had a lovely relationship with those teachers.' (Sid's mother)

Trevor talked very positively about his form tutor in Year 7. He clearly valued her support and recognised the difference it made to his life for that one year. He talked about how he '…just felt so happy that someone actually…wants to help me for once in my life' – highlighting how abandoned he must have felt otherwise.

Discussion

The findings described above suggest that the way in which young people conceptualise difference is key in addressing how they respond emotionally to their learning differences. Where difference is perceived as a negative and something that needs to be kept hidden at school, there is a responsibility on schools to change these negative perceptions and support young people with severe dyslexic difficulties to construct an identity that is free of stigma and shame about their additional needs.

The research contends that teachers assimilate institutional discourses which are prevalent within education in England – the privileging of literacy and the positioning of dyslexia as a deficit - and that this has an emotional impact on young people with severe dyslexic difficulties. Schools can shift this narrative by creating a whole school ethos of inclusivity and neurodiversity where difference is recognised and appreciated. Arguably, teachers may not always have the autonomy and freedom to make institutional change, however, they can help to disrupt these kinds of embedded discourses and cultural norms in their

everyday, micro interactions with young people. This could involve teachers being careful to use positive language around difference and additional needs, creating an atmosphere within their classrooms in which young people feel valued for who they are rather than what they can achieve academically and promoting young people's strengths among their peers and within the school.

Within the ableist environment of the school, where the medical model of disability is most prominent, teachers may also choose to talk directly to young people about shifting their thinking away from the deficit model towards an appreciation of the social barriers they experience. This could run alongside a programme whereby all students, for example a year cohort or the whole school, are taught self-compassion and are encouraged not to compare themselves with others.

The research also found that teachers can support young people with severe dyslexic difficulties to respond more positively to their dyslexic difficulties if they are trusted by them, show them care and respect and validate them. Key to this is consulting young people about their support at school and nurturing their agency. Teachers who showed empathy and sensitivity to their students were also valued by the young people in the research.

To conclude, my research contends that the responsibility for any stigma associated with dyslexia lies with society and that it is perpetuated through interactions between young people and their teachers and peers. Whilst acknowledging the pressure that practitioners are already working under, I argue that school leaders can address young people's negative associations with difference and their feelings of shame about their additional needs by building a culture of inclusivity and neurodiversity within their schools, where difference is normalised and accepted and stigma is challenged. Teachers may also benefit from training which involves discussions about neurodiversity and the shame that some young people feel about their literacy difficulties. Based on evidence from the research, this involves more of a change of emphasis and a different approach to working with young people, rather than specific measures.

Recommendations

- Schools to create a whole school ethos of inclusivity and neurodiversity, which includes training for teachers to understand the emotional impact of having severe dyslexic difficulties, the importance of using positive language around difference and additional needs and promoting all strengths, not just academic achievement.
- Programmes for all students in which they are taught self-compassion and encouraged not to compare themselves with others.

- Teachers to support young people with severe dyslexic difficulties by being someone they can trust and who shows them care, respect and empathy.

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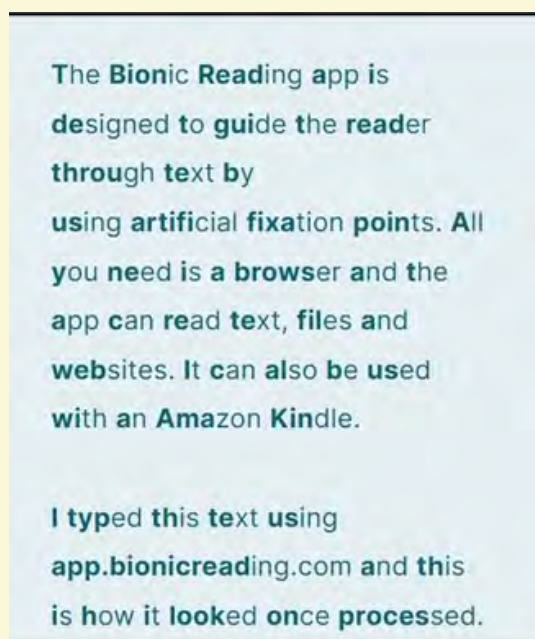
Apps and Resources

Bionic Reading®

Bionic Reading® is a productivity app designed to enhance focus, speed and comprehension when reading, for individuals aged 17+ years.

Available at the Apple App Store (iOS); Google Play (Android); Chrome web store.

At the time of writing (March 2023) the app is free, but the developers state that this will be for a limited time only. They are aiming to keep a free version and provide the possibility of upgrades.

How does it work?

It guides the reader's eyes over text by emphasising letters and syllables in a bold font (these are described as 'artificial fixation points'). Thus, the eyes focus on the concise parts of words and the brain draws on its lexicon to read them.

The **Bionic Read**ing app is designed to **gui**de the reader **throu**gh text by using artificial fixation points. All you need is a browser and the app can read text, files and websites. It can also be used with an Amazon Kindle.

I typed this text using app.bionicreading.com and this is how it looked once processed.

In 'settings' the reader can customise the number of fixations and saccades, and their visibility in the text. 'Details' and 'display' functions enable the choice of preferred font, font size, line height, letter spacing and column width. You can also change the colour of the text and background as well as choosing between light and dark mode.
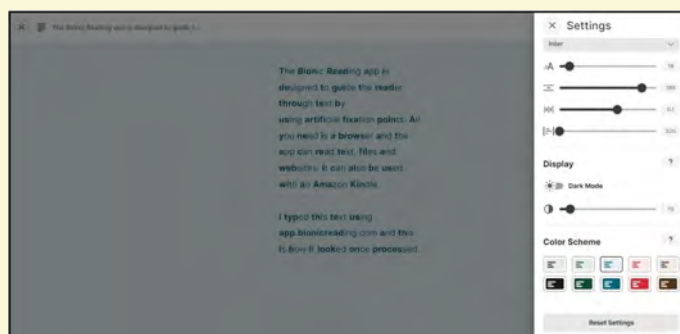
The app helps read text, files and websites and can be used in conjunction with an Amazon® Kindle. All you need is a browser for it to be used on a smartphone, notebook, tablet, laptop or desktop computer.

The app is dyslexia-friendly and appears to be generating curiosity and excitement, particularly among neurodivergent students and adults. I have heard people with ADHD say that it helps them focus better when reading lengthier texts, and for those with Dyslexia, it helps them read with greater fluency, so improving their comprehension and reducing the need to re-read text.

However, like any new product, it appears to be dividing opinion, with others commenting that they find the adjusted text more visually complex to

process. It comes down to personal taste! On a practical note, the app will benefit from further developments to make it more user-friendly. For example, currently when original text is processed and the choice is given to download it as a pdf, the text appears in a thin column, despite people's best efforts to adjust the layout beforehand.

The founder and owner of Bionic Reading® is a typographic designer from Switzerland with 25 years of experience. The foundation for the app's development is grounded in historical research regarding the relationship between eye movements and text comprehension, including Just and Carpenter's text comprehension model (1980).

Overall, this is an exciting new app that is likely to develop over time but is already having a positive influence in helping students and adults to read with greater focus, speed and comprehension.

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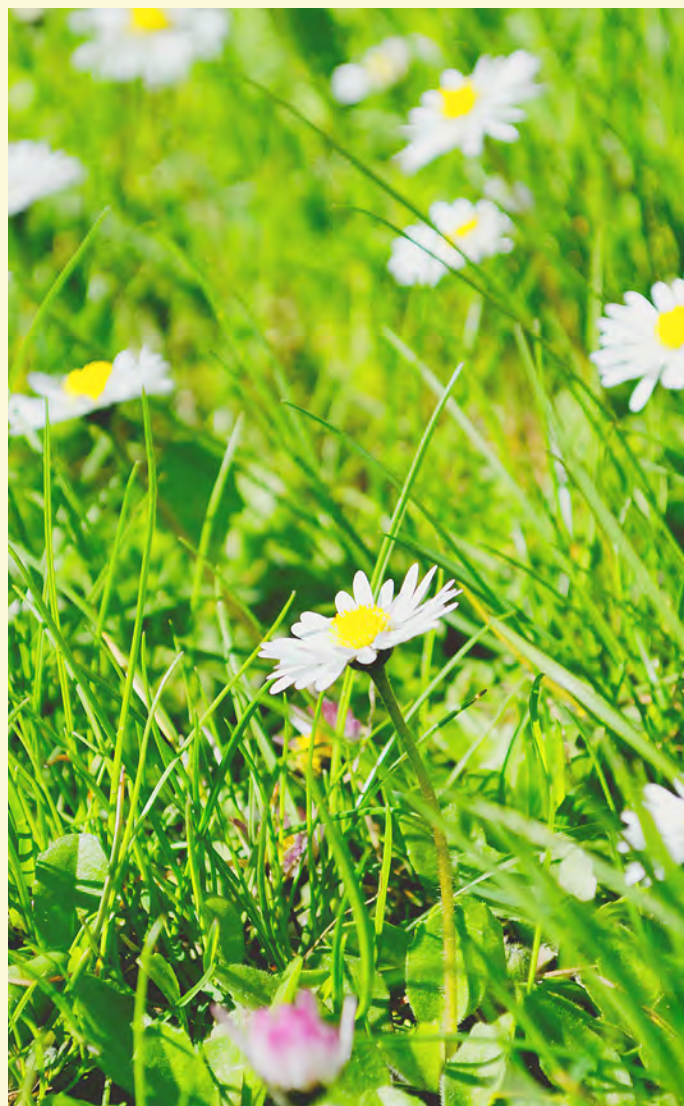
Remember the Milk (RTM)

Available as iOS or Android mobile app, or web interface.

Link to web page https://www.rememberthemilk.com

Free version with several useful features, advanced version has to be paid for.

Reviewed by Glynis Lavington

Remember the Milk (RTM) is a task management App, a way of organising 'to do lists'. Tasks and lists can be shared with others, you can set reminders, and the App will integrate with Gmail, Google Calendar, and Evernote and sync on all your devices. You can set up tasks with a due date, start date, reminders, and a priority level; tasks can also be grouped for example, work tasks, personal tasks, and sub tasks can be added. Navigating the App is very easy and there are tutorials provided for new users.

RTM is a user friendly App and a practical way to get all those 'to do' thoughts out of your head and stop thinking about them, leaving space to concentrate on a task you need to focus on. If you cannot remember where a task is located, you can use the search feature and enter a word that appears in the task. There is a help feature that is easy to access to guide you through all the options, whilst you get used to using the App.

I think this App is useful for adults, young people, and students to use. In my experience working with dyslexic adults, a coping strategy often used is to create lists and reminders but what starts out as a useful strategy becomes overwhelming, when there are multiple lists or sticky notes in various locations! This App enables the user to collate lists in one place, sorted into categories such as work or personal which makes it easy to organise and find a particular task. The App integrates and syncs across all the user's devices, which also helps as the information can be viewed and updated conveniently wherever the user happens to be. The platform enables you to collaborate with other users, which makes it easy to work on joint projects e.g., students working on a group assignment. One point to remember is that the efficiency of the App is dependent on the information entered, for example setting a reminder date and time that is realistic and practical. Specialist Teachers and Coaches can help with this aspect and efficient use of the App can be incorporated into a teaching/coaching session on organisation, time management and planning.

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Glynis works as an independent consultant, tutor and assessor specialising in working with adults in the workplace, and students aged 16+ in further and higher education. Glynis provides dyslexia awareness training and consultations in the workplace, and she also delivers teacher training in a variety of settings.

Magnetic building blocks

I love to make my games, include maths and likewise plan my maths lessons to include games. Maths is fun and children really enjoy it when they truly get to play with the ideas.


Recently one of my students had been struggling with the language of edges, faces and the shape names. I had some magnetic building blocks and thought they'd be a fun way to explain the terms rather than pointing out the edge of the desk and the face of a cube. Immediately she was entranced and as far as she was concerned the lesson was over and it was playtime! So, she started building a box and we came up with different names but settled on the shape name of cube, then we extended it to make a cuboid. Identifying the edges, vertices and faces became part of the game. Within a few minutes having broken up the cube by accident we moved into nets and she then experimented with

different permutations to explore which would make the nets and which would not.

By now the other children wanted, and did, join in. We had triangular prisms and both square based and triangular based pyramids, with the nets to go with them.

This was just one of those activities that took off and was far more successful than I had anticipated. I am sure that the magnetic building blocks being viewed as a toy rather than my stealth educational resource had a lot to do with the enjoyment and achievement of the activity.

Jan Thomson-Long is a specialist dyscalculia teacher & assessor who manages the Southampton Tuition Centre who tutor children in English, Maths and Science as well as providing private educational testing services. jan@sotontuition.com
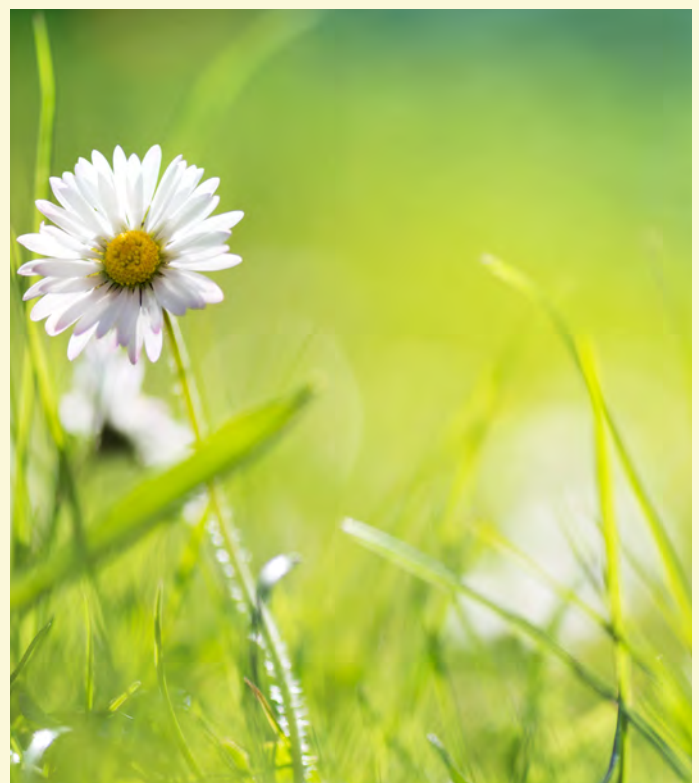
Book Reviews

Title: The Adult Side of Dyslexia

Author: Kelli Sandman-Hurley

Publisher: Jessica Kingsley Publishers, London

Year of Publication: 2022

Number of pages: 124

Price of the book: £ 14.99 paperback

ISBN number: 978-1-78775-475-1

Kelli Sandman-Hurley is an doctor of education and the author of books about dyslexia, in addition to being a co-founder of the Dyslexia Training Institute in the United States. She has also appeared as an expert witness in the California state assembly successfully advocating for legislation for dyslexia identification in schools.

The book is a humane, engaging introduction to the adult lived experience of adult dyslexic learners and their childhood struggles in acquiring literacy, specialist support and assessment. Sandman-Hurley interviewed a range of dyslexic adults with a diversity of professions and jobs, economic and education levels, races and religions. Some adults were inmates at a California state prison; some had parents still living who were also interviewed. The interviewees were not exclusively American; British, Irish, Canadian and Australians were also in the cohort. Though the author's experience is in the American state school systems, the book is not a guidebook for negotiating the specificities of the American education system. The struggles and successes of these adults would ring true for dyslexic adults and mature students in the UK. This is more of a dyslexia awareness book with tips and strategies for support, and suggestions for future improvements by those who have lived it.

The book is written in a direct, conversational and anecdotal style. It has a dyslexia friendly layout with open line spacing, a sans serif font, and a soft black ink printed on cream paper.

The chapter headings summarise the interview questions. Amongst these are: How Would You Describe Your Dyslexia? ; Traumatic Teaching Practices; Is Spelling Important to You?; Has Dyslexia Affected Your Ability to Succeed?

I found the chapter Is Dyslexia a Gift ? especially interesting with a variety of enlightening, at times conflicting, opinions and discussions about the " gift", with support, hard work and individual experience being declared relevant aspects. Diversity of access and opportunity also made a marked difference to the answers.

Each chapter starts with a brief personal story of one individual which is followed by the comments of the adult interviewees highlighted in a speech bubble and interspersed with authorial discussion. Each chapter ends with a section titled "What Did We Learn?" A last paragraph labelled " Myth" summarises with a myth busting explanation.

The last chapter, Acknowledge, Advocate and Accommodate, consists of sections separately addressed to Parents, Adults with Dyslexia, Educators and Researchers with tips, strategies, forward plans. The book finishes with the author's discussions about self-advocacy and the importance of accommodations.

The author's highlighting of the mental health toll and emotional challenges that dyslexic learners may have to manage is particularly timely with the educational disruption brought about by the pandemic. She makes a plea for improved support for student mental health issues. This has been a growing concern and area of research and intervention within UK education too.

The book would be particularly useful to educators in Further, Higher Education and Adult education, as well as professionals working in company Human Resources departments, company training programmes and professional qualifications such as nursing and accountancy. Family members who either suspect their own dyslexia or have family members of any age who may be dyslexic could also benefit from its empathy and insights. Because the book asks dyslexic adults how their dyslexia affected them during their childhood education, and the adults describe what did and didn't work, this book would also give primary and secondary school teachers insights into the range of experience dyslexic children can have and the difference the teacher can make to their dyslexic and undiagnosed students. It would be a quick, easy read for a teacher in training.

The message ultimately is the same as that heard in the UK. What makes a difference to dyslexic learners and their self-belief and mental health, their skills and successes ? Earliest possible assessment and specialist intervention, and family and environmental support and resources.

Lynn Ross is a retired dyslexia specialist teacher, assessor and SEND secondary school teacher.

Title: GCSE Maths for Neurodivergent Learners

Authors: Judy Hornigold and Rose Jewell with illustrations by Sophie Kennedy

Publisher: Jessica Kingsley Publishers

Year of Publication: 2022

Number of pages: 310

Price of the book: £22.99 paperback (also available on Kindle)

ISBN number: 978-1-78775-700-4

Both Judy Hornigold and Rose Jewell are well known and have previously written books within their own spheres of dyscalculia and mathematics. Now they've joined forces to produce a book that GCSE Maths teachers would definitely benefit from reading, as would any teacher who is supporting students who are struggling with numeracy.

Forwarded by Steve Chinn, the mathematics educator who specialises in maths learning difficulties, the book is in three sections. The initial section explains what neurodiversity is and many of its variations. Individuals are truly that, individuals with individual brains that may be diagnosed with specific learning difficulties. Although each of these difficulties has features that differentiate it from the others, many people have co-occurrence of neurodiversity. This section explains the overall difficulties and strengths that can be experienced by neurodiverse students and how that impacts upon their learning including mathematics.

Throughout the book, it should be remembered that, as every brain is different, not all methods will be suitable for all learners.

Part 2 is all about the methods. Teachers know that they often need to explain using different methods; this book will add to their toolbox in terms of approaches to many maths topics and help students 'see' and enjoy maths.

The methods are well explained, but I would suggest that if one is completely new to you, that you physically get the resources out and 'play' with them. Using bar modelling to solve complex word problems shows how difficult concepts really don't need to be that difficult but have been made so by the procedures being taught. That being said, I personally don't like Napier's bones multiplication method but, as said, it's another tool in the box and may well suit some. My favourite is the two-

coloured counters. I discovered 'zero pairs' which is an amazing tool when I was doing my PGCE in Dyscalculia. It shows really clearly negative numbers among other things.

The final part of this book is all about how to prepare for the exam, revision techniques, what to do in the exam and how to approach it.

'GCSE Maths for Neurodivergent Learners' is very accessible and informative. I would recommend it for all secondary schools as an essential CPD (Continuing Professional Development) for all maths teachers, teaching assistants and SENCos.

Jan Thomson-Long is a specialist dyscalculia teacher & assessor who manages the Southampton Tuition Centre who tutor children in English, Maths and Science as well as providing private educational testing services. jan@sotontuition.com

Title: Exploring Science with Dyslexic Children and Teens

Author: Diana Hudson

Publisher: Jessica Kingsley Publishers, London and Philadelphia

Year of Publication: 2021

Number of pages: 155

Price of the book: Paperback £13.99

ISBN number: 978-1-79775-386-0

Every now and then a book comes along that makes me itch to get back into the classroom. This is one such book. Diana Hudson has that rare ability to combine experience with a fresh, enquiring outlook that shines through from each page. She's been a science teacher for over 40 years, specialised as a special educational needs coordinator (SENCo), is herself diagnosed with dyslexia and is the mother of children with dyslexia/dyscalculia, so she approaches the issue of how we can teach science to dyslexic children and teens with a deep understanding of all those involved.

The book is dyslexia friendly and engaging throughout. It is accessible and well laid out, with large font, clear tables and figures, and lovely lively illustrations by Jon English. There are useful signposts throughout: contents; chapter headings; page numbers; up-to-date resources sections at the end of each chapter (including relevant webpages, poems, instructions, animations and film clips); a

glossary of terms; and a detailed index. There are also photocopiable templates for the cards, games and puzzles mentioned in the book, with the possibility of accessing these online as well. One particularly nice feature is the use of symbols, for instance a house to denote things you might want to try at home.

As John Holman, scientist and educator, says in his excellent introduction, the book is designed to be a 'pick and mix basket of ideas' – there is no expectation that you need to read the whole thing, because reading a whole book can be a daunting prospect. Having said this, I read the whole book and thoroughly enjoyed it.

The first chapter explores the many potential strengths of dyslexic learners, before discussing the unique aspects of science that can make it particularly challenging for children and teens with dyslexia (for instance memorising formulae, spelling scientific terms, reading and interpreting graphs). It then proposes a number of strategies that can be used to help overcome these barriers. The real strength of the books lies in these ideas – they are an imaginative range of exciting ways to approach teaching science, which bring the multisensory approach to life in a number of novel ways.

Chapters Two to Eight focus on different senses, with a wealth of engaging ideas and suggestions. As well as the senses sight (Chapter Two 'Look and See') sound (Chapter Three 'Hear and Say') and touch (Chapter Four 'Touch, Make and Do'), the

book also acknowledges the importance of story, song, fun, movement and embodied learning. Diana quotes Gill Connell, 'A moving child is a learning child', so Chapters Five to Eight include a range of games, acting, mime and dance ideas, which are all too rarely used to embrace the teaching of science in schools.

I have picked a few of my favourites to give a flavour of what the book can offer. Chapter Three ('Touch, Make and Do') includes: origami models of molecules or organelles (with a link to the website where you can find out how to do this); chemical bond jigsaw puzzles; diffusion and osmosis using polystyrene balls. Chapter Seven (Act and Mime) has a range of great warm up activities (I loved 'Bubble' p. 90) as well as ideas for how to use mime to learn about scientific processes – making molecules in a game like musical chairs (to make water molecules when the music stops, two children who are hydrogen need to find one who is oxygen).

The book is aimed at everyone who works and lives with young budding scientists – teachers and families. I would recommend it to all parents and science teachers because these innovative approaches would benefit all learners, but it is especially appropriate for those who are dyslexic. Now, excuse me but I'm off to write a haiku about electricity…

Kate Humphreys has worked for over 20 years as a teacher, SENCo, dyslexia assessor and lecturer. Currently working on the Nuffield Early Language Intervention (NELI) programme with Oxford University, she is a study skills tutor for dyslexic students at UK universities and a Read Easy volunteer.
Email address: aatutorkjh@gmail.com

Title: Teaching Literacy to Learners with Dyslexia

A Multisensory Approach :   3rd Edition

Author: Kathleen Kelly and Sylvia Phillips

Publisher: Sage

Year of Publication: 2022

Number of pages: 502

Price of the book: Paperback £29.07

ISBN number: 978-1529767834

Kathleen Kelly and Sylvia Phillips's two earlier editions of 'Teaching Literacy to Learners with Dyslexia : A Multisensory Approach' have been essential reading for all in the SpLD/dyslexia world - particularly to those involved in courses training specialist teachers – combining current theory underpinning dyslexia practice with structured practical support programme. There are usually two reasons to buy the latest edition of a text: the writer's perspective has changed and/or the book is developing new valuable practical suggestions. Is this the case with Kelly and Phillips's Third edition?

This follows the same structure as the first two. Nothing has been dropped from edition 2 . It is divided into two main sections: the first five chapters, Teaching Learners with Dyslexia – Theory and context, has been expanded into two parts to add Teaching Literacy to Learners with Dyslexic Type Difficulties. Part two separates into three expanded chapters – Strategies for, respectively, Reading , Spelling and Writing, previously included in part One. These are a welcome new development. They provide ideas for working with learners who are failing to acquire literacy, either due to milder dyslexia or other issues. They may not need, or be able, in the current climate, to access the full individualised Conquering Literacy Programme (CLP). These 3 chapters also explore 'study skills' issues such as higher order reading skills, fluency, syllables, spelling strategies and ICT. Teachers can take these essential practical ideas straight to their learners and use the book's clear index to look up any area where they might need support suggestions.

As in the earlier editions, Parts three and four of Edition 3 , introduce and implement the CLP; very little is changed. This specialist training course covers and justifies the principles of structured, cumulative lesson planning and multi-sensory teaching exploring the phonics, morphology and metacognition underpinning them. Chapters 9 to 13 cover lesson planning, alphabet knowledge, memory, introduction and reinforcement of teaching points, helping specialist teachers to organise and

operate successfully. Part four summarises the full CLP programme: a thorough placement test and 150 pages of practical examples of lesson plans, reading and spelling cards and activities prior to two useful appendices – adapting the programme for younger children and, new and really welcome, suggestions for working with small groups within schools.

Kelly and Phillips acknowledge the role of pioneers Gillingham, Stillman, Hickey and Cowdery in development of the CLP which also incorporates many new ideas from other tested programmes.

Part five Section A explains how to use the placement test to start teaching at the appropriate point on the programme for any individual and the concept and content of the Accelerated programme. Parts three , four and five do not differ significantly from the 2nd edition.

However C, a new section to Part five, Beyond the Accelerated Programme, provides placement tests for reading accuracy and comprehension skills, dictations to identify gaps in phoneme/ grapheme concept knowledge, suggestions for support, for access arrangements, study skills and examination revision techniques, none of which are original but are nicely placed here. I do regret, however, the removal of Edition 2's chapter 13 on Study Skills within the Programme, from this 3rd edition, Part 3. I suspect that much of it may have been shifted to the new Part 2 Learners with Dyslexic Type Difficulties but so many dyslexic learners

need structured support with study skills alongside the multisensory literacy work provided in the CLP. Specialist teachers need direct guidance in incorporating this aspect of learning into their individualised programme planning.

All chapters in all editions are accessible and dyslexia friendly. They provide an overview at the start, frequent boxed resumes, a final chapter summary and full references. I particularly like the highlights titled 'implications for practice' and the springboards from research to teaching included in the more theoretical Part One. This helps readers and students on SpLD/Dyslexia courses habitually to apply research evidence to their practice. The helpful downloadable resources and the glossary of terms are unchanged.

So does the 3rd edition justify the need to buy it, if you already have edition 2? Have the writers' perspectives changed?   Yes, the theoretical chapters for Edition 2 date from 2014;   much thinking has changed and Kelly and Phillips have developed clear and effective discussions to reflect the complex ongoing debates around the definitions and aetiology of SpLD/dyslexia. The memory chapter has also been strengthened to reflect its role in the multi-factorial causation model.

Does the 3rd edition provide new suggestions? Yes, in addition to the theory, these innovations are helpful and practical for both learners and teachers:

- the three chapters supporting learners with dyslexic type difficulties who might not have access to the CLP;
- the new section on teaching groups within school - which may well become the common type of dyslexia support within the current climate.
- the new chapter – Beyond the accelerated programme.

So should you invest in this book?

If you do not already have a copy, it is an essential book for all teachers who work with learners who struggle with literacy.   If you already have the second edition, do you find yourself working with groups as well as individually? Do you often find your learners need support with higher order skills or do you work with older learners with gaps in their knowledge?   Do you feel you need to be fully informed about the latest dyslexia research! If 'yes to all these, the third edition is a really good investment for you.

Dr Tilly Mortimore: Retired lecturer, researcher, writer and member of BDA Course Accreditation Board

Guidelines for submitting research articles for the PATOSS Bulletin

The Editor welcomes contributions from all PATOSS Members and other professionals in the field on any topic related to recent Specific Learning Difficulties. This could be an independent study or research which has been conducted as part of Masters/PhD study or as action research in your place of work.

Please ensure that you observe the guidelines below, particularly word length.

1. Research articles can be **up to 3,000 words**.

2. There should be:
- An abstract of about 200 words: An abstract is a concise summary of the whole paper, not just the conclusions, and is understandable without reference to the rest of the paper. It should contain no citation to other published work.
- Include up to six **keywords** that describe your paper for indexing purposes.
- A brief introduction which provides a background to the research;
- A discussion of the research methodology and research design;
- A section on the findings and results;
- A discussion of the results and the implications for professional practice;
- A full and accurate reference list which should follow the Harvard model.

3. Manuscript Type:
All submissions must have a title, be double-line spaced and have a margin of 3cm all round. Illustrations and tables should not be incorporated into the text and must be submitted separately as a WORD document as an e-mail attachment. Ensure that all articles including illustrations are black and white. Footnotes are to be avoided: parentheses should be used instead.

4. For articles which have previously been published in another form, prior permission must be obtained by the sender from the original publisher, before submission to the Bulletin.

5. Once an article has been accepted for publication the PATOSS Bulletin must be fully acknowledged in any subsequent publication of part or whole of the article elsewhere.

6. Please ensure that your name is on the contribution sent. If you wish to have your professional Post and /or an e-mail address or telephone number on your contribution, if published, please include these at the bottom of the item with your name as you wish it to appear.

7. The Bulletin is published bi-annually, in Summer and in Winter.

8. All articles for review are posted at the sender's own risk and cannot be returned. Articles are acknowledged on receipt.

9. Submission of articles does not guarantee Inclusion in any edition of the Bulletin. The article will be reviewed by two independent reviewers who may make suggestions for adjustments. For individual queries or guidance on writing articles please contact the Editor-in chief, whose decision is final.

Do have the confidence to write – *please remember that your research does count* and could make a difference to the teaching of many more pupils/students than your own! The Bulletin is your Professional Journal and a vital way to keep in touch with colleagues, ideas and research in SpLD.

Please do contact Julia Kender, Editor-in-Chief if you know of a non-member willing to write about research involving SpLD, which you feel should be disseminated more widely.

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