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Abstract

This narrative literature review evaluates the effectiveness of synthetic phonics in comparison with analytic phonics. It presents the key research findings and offers a critical appraisal of this research. Primary schools have developed a variety of assessment processes which assess pupils' knowledge and skills in synthetic phonics. It is through using these assessment tools that gaps in pupils' knowledge and skills are identified and these gaps then form the basis of subsequent synthetic phonics interventions. The paper concludes by arguing that a more detailed assessment framework may be required for the purpose of assessing children's reading development than the model which schools currently adopt.

Assessing reading development through systematic synthetic phonics

This narrative literature review evaluates the effectiveness of synthetic phonics in comparison with analytic phonics. It presents the key research findings and offers a critical appraisal of this research. For over a decade now, and following the publication of the Rose Review in 2006 (Rose, 2006), educational policy in England has emphasised the need for schools to provide children with a systematic programme of synthetic phonics instruction. In synthetic phonics children learn to read by identifying the smallest units of sound within a word (phonemes) and blending these together to read the target word. It is different to other approaches to phonics which focus on blending larger units of sound.

The emphasis on synthetic phonics has been embedded into the Teachers' Standards (DfE, 2011) in order to ensure that all teachers have good subject knowledge in relation to synthetic phonics. The Teachers' Standards were developed by the Department for Education (DfE) in 2011 to provide a framework for identifying the minimum standards expected of all teachers. In addition, inspection frameworks for both for initial teacher education providers and schools have been revised several

times since 2006 and these revisions have resulted in inspectors paying increasing attention to the teaching of synthetic phonics in schools.

Schools have developed a variety of assessment processes which assess pupils' knowledge and skills in synthetic phonics. It is through using these assessment tools that gaps in pupils' knowledge and skills are identified and these gaps then form the basis of subsequent synthetic phonics interventions. For some children synthetic phonics is highly effective in enabling them to master the skill of *decoding*. This provides them with a strategy to read unknown words. However, for others the approach is less effective. For example, dyslexics sometimes struggle to master the skill of decoding and instead rely on whole word recognition strategies. This raises a question about whether an alternative approach to learning to read would be more beneficial for pupils who have difficulty processing sound at the level of the phoneme. For these children alternative methods of assessing their reading development and teaching them may be necessary.

Although logic suggests that one size does not fit all, the emphasis on synthetic phonics in the Teachers' Standards suggests quite the opposite. Thus, even if early assessments indicate that the approach is not successful, the political endorsement of synthetic phonics in the Teachers' Standards suggests that teachers should persevere with this approach by providing systematic synthetic phonics intervention programmes for those children who are falling behind. This is deeply worrying given that subsequent further failure can impact detrimentally on children's self-concept.

This paper examines two approaches to phonics to identify which is the most effective. It concludes by arguing that a more detailed assessment framework may be required for assessing children's reading development.

Definitions

The term 'synthetic' is taken from the verb 'to synthesise'. Beginning readers are taught grapheme-phoneme correspondences and taught to *blend* phonemes all through the word right from the outset in order to develop word reading skills (Johnston and Watson, 2007). They are also taught the reverse process of *segmenting* a spoken word into its constituent phonemes. These are then represented as graphemes for spelling. Letter sounds are learnt at a rapid pace and the skills of blending and segmenting are taught from the start (Johnston and Watson, 2007). In contrast analytic phonics introduces blending much later in the process. Children are taught to analyse the common phoneme in a set of words and individual phonemes are not pronounced in isolation (Strickland, 1998).

Evidence for synthetic phonics

The Rose Review in England (Rose, 2006) concluded that:

Having considered a wide range of evidence, the review has concluded that the case for systematic phonic work is overwhelming and much strengthened by a synthetic approach.

(Rose, 2006, para 51: 20)

In this review Rose recommended that synthetic phonics 'offers the best route to becoming skilled readers' (p.19) and he argued that teachers should be required to teach synthetic phonics 'first' and 'fast'. This recommendation informed literacy policy in the England and the content of initial teacher education courses.

Rose substantiated his claim by drawing evidence from the Clackmannanshire research in Scotland (Watson and Johnston, 1998). The second experiment examined the performance of three groups of children who received intervention over a 10-week period. Each intervention lasted for 15 minutes twice a week. One group received sight vocabulary training, a second group received intervention in analytic phonics and a third group received intervention in synthetic phonics. The results led the researchers to conclude that synthetic phonics led to better reading,

spelling and phonemic awareness gains than the other two approaches (Watson and Johnston, 1998).

A longitudinal study reported by Johnston and Watson (2005) has demonstrated that synthetic phonics is particularly effective for boys. This study reported that both boys and girls demonstrated substantial gains in word reading, spelling and comprehension which were sustained over time when taught through a synthetic phonics approach. However, the gain was larger for boys (Johnston and Watson, 2005). Additionally, the research found that synthetic phonics enabled children from areas of deprivation to overcome social disadvantage by demonstrating gains in reading and spelling which enabled these children to perform above their chronological age (Johnson and Watson, 2005). More recent research also supports these findings. For example, a study by Johnston *et al* (2011) compared the performance of 10-year old boys and girls who had been taught to read by either synthetic or analytic phonics. The study found that the group taught by synthetic phonics had better spelling, word reading and comprehension than the group taught by analytic phonics. Additionally, the results demonstrated that the boys taught by synthetic phonics had better word reading, spelling and comprehension than the girls who had been taught by the same method.

However, the Clackmannanshire research (experiment 2 specifically) has received considerable criticism in the academic literature (Wyse and Goswami, 2008). The study lacked sufficient rigour in its design to establish whether the synthetic approach is superior to the analytic approach (Wyse and Goswami, 2008). Children in the analytic phonics group were taught fewer letters than children in the synthetic phonics group (Wyse and Styles, 2007) and the groups were given different amounts of teaching (Wyse and Styles, 2007). Additionally, the research design did not isolate the impact of additional treatment factors which might have contributed to the gains in reading, spelling and phonemic awareness (Ellis and Moss, 2014). For

example, factors such as: teacher effectiveness; parents' educational attainment; the quality of the literacy environment in the home; remedial help offered outside the intervention and other reading interventions which operated within the school were not controlled and therefore the evidence is insufficiently robust (Ellis and Moss, 2014). The study failed to report information about the time spent on phonics instruction outside the intervention, time spent on other reading activities and the contexts in which children were exposed to phonics (Ellis and Moss, 2014). Given these serious flaws in the reporting of the research and the design of the study Ellis and Moss have concluded that:

The weakness of the research design, including the way the statistical data were analysed and reported, suggest it would be unwise to draw any clear conclusions for pedagogy or policy from this single study.

(Ellis and Moss, 2014: 249)

Despite the methodological weaknesses of the Clackmannanshire research Johnston and Watson (2005) concluded that 'synthetic phonics was a more effective approach to teaching reading, spelling and phonemic awareness than analytic phonics (p.351). However, as Wyse and Styles (2007) point out 'it is important that gains are shown for comprehension, not just for decoding and related skills' (p.39). In the first experiment the reporting of the comprehension outcomes was ambiguous and in the second experiment the comprehension findings were not reported (Wyse and Styles, 2007). The subsequent longitudinal study which was published by Johnston and Watson (2005) reported gains in comprehension scores but there was no control group so it is impossible to attribute gains in comprehension to synthetic phonics (Wyse and Styles, 2007). Additionally, comprehension scores during the longitudinal study were assessed using different tests, thus invalidating any results.

Following the Clackmannanshire studies, the Scottish inspectorate confirmed that Clackmannanshire was “below the average for comparator authorities” (HMIE, 2006, p. 4), thus discrediting the findings of the research. Given the serious limitations of the research, it is questionable why Rose (2006) who acknowledged the criticisms that were levelled against the research, failed to take any of these into account. The recommendations of the Rose Review were subsequently cemented into English national policy through a political emphasis on synthetic phonics in government White Papers (DfE, 2010; DfE, 2016), the Teachers’ Standards (DfE, 2011) and the introduction of the phonics screening check in Year 1 of the national curriculum. Additionally, the results of the phonics screening check were included in data provided to school inspectors, resulting in penalties in inspection outcomes for those schools where children under-performed in this assessment. Schools were also provided with additional funding for purchasing synthetic phonics resources. These strategies served the purpose of raising the profile of synthetic phonics in schools. To launch a policy change on a lack of robust, empirical evidence was both hasty and naïve and not an adequate solution for addressing England’s low position in the international literacy league tables.

Evidence for analytic phonics

Analytic phonics is often described as processing text by going from *whole to part* rather than *part to whole* as is the case in synthetic phonics (Moustafa and Maldonado-Colon (1998). It is a strategy which emphasises the use of larger grain sizes, including the use of rimes.

Goswami (2005) has argued that synthetic phonics is highly effective in orthographically consistent languages. However, in languages such as English, which are not orthographically consistent, it is more difficult for children to use smaller grain sizes (i.e. phonemes) because the inconsistency is greater for smaller grapheme units than for larger grain sizes such as rimes (Goswami, 2005). In

English, one grapheme can be represented by multiple phonemes, whilst in many other languages letters are consistently pronounced in the same way. Additionally, in English one phoneme can be represented by multiple graphemes whilst in most other languages a phoneme is always spelt in the same way.

The complexities of the English language inevitably mean that teaching phonics through small grain sizes will result in confusion for beginning readers, especially when there is inconsistency in the sounds represented by these units in different words. Additionally, the inconsistencies also transfer to spelling in that one sound is represented by different graphemes in different words. Goswami (2005) argues that a developmental teaching sequence based on developing rhyming skills helps children to read by analogy and better suits the irregular orthography of English.

Research suggests that children code switch from small to large grain sizes when learning English depending on the word they are reading (Brown and Deavers, 1999; Goswami *et al*, 2003). Some words have to be learned as wholes because they have 'no orthographic neighbours' (Goswami, 2005: 281). Other words, particularly CVC words, have consistent letter-phoneme recoding and the use of small grain sizes is an effective decoding strategy in these cases (Goswami, 2005). Some words contain rimes that are common to other words (*light/ fight*) and therefore the use of rimes works particularly well in these cases. This suggests that analytic phonics has an important role to play in learning to read, given the orthographic inconsistencies of the English language. Thus, a combination of approaches may be necessary in order to enable children to develop the skill of word recognition.

Synthesis

According to Torgerson *et al.*, 'There is currently no strong randomised controlled trial evidence that any one form of systematic phonics is more effective than any other' (2006: 49). Research evidence which is available is insufficient to allow for reliable judgements to be made about the efficiency of different approaches to systematic phonics instruction (Stuart, 2006). In countries where there are one-to-

one mappings between letters and sounds (such as in Finland, Greece, Italy and Spain) there is evidence to suggest that synthetic phonics can be extremely effective (Landerl, 2000). However, the phonological complexity of the English language and the inconsistent spelling system mean that there is a need for direct instruction at levels other than the level of the phoneme in order to produce effective readers (Goswami, 2005; Wyse and Goswami, 2008). The inconsistency of English inhibits the automatic correspondences between graphemes and their phonemes (Goswami, 1994; Seymour *et al.*, 2003) and thus it seems logical to suggest that beginning readers should be taught a range of grain sizes rather than focusing solely on the level of the phoneme.

There is now a considerable body of evidence to suggest that no one method of teaching children to read is superior to any other method (Landerl, 2000; Spencer and Hanley, 2003; Torgerson *et al.*, 2006; Walton *et al.*, 2001) and there is no empirical evidence to justify Rose's recommendation that the teaching of reading in England should rely on synthetic phonics. Much of his evidence was anecdotal (Wyse and Goswami, 2008) rather than empirical and formulating policy on the basis of anecdotal evidence lacks sufficient rigour to justify its implementation.

However, although the evidence on the most effective approach to teaching phonics is inconclusive, there is clear evidence that a systematic approach to phonics produces gains in word reading and spelling (Torgerson *et al.*, 2006) irrespective of whether analytic or synthetic phonics is used. Walton *et al.*, (2001) concluded from their research that as long as tuition was systematic, then both approaches (synthetic or analytic) lead to similar gains and this finding is supported by a range of studies (Landerl, 2000; Spencer and Hanley, 2003; Torgerson *et al.*, 2006; Walton *et al.*, 2001).

Discussion and conclusion: an alternative assessment battery

Teaching and assessing reading

Approaches to teaching and assessing reading have moved from a psycholinguistic model to a cognitive model. The National Literacy Strategy in England (DfEE, 1998) advocated the searchlights model of teaching reading. This framework enabled teachers to select different strategies (phonics, grammatical, contextual and graphic) for developing the skill of word recognition. As this framework made phonics an optional strategy, Rose (2006) recommended that this model of teaching reading be reconstructed into the Simple View of Reading (SVOR) which was developed by Gough and Tunmer in the 1980s (Gough and Tunmer, 1986). This model separates out the skills of reading development into word recognition and linguistic comprehension. Both skills are necessary for effective reading and teachers can use the framework to assess children's development in each skill to determine what kind of intervention children need.

The separation of the skills is useful in that the SVOR demonstrates that different approaches to teaching are required to develop word recognition skills and linguistic comprehension. By identifying linguistic comprehension as an essential element of reading development the SVOR highlights the importance of oral language and language comprehension in the process of reading development.

Despite its significant strengths the SVOR does not break down the sub-components of word recognition or linguistic comprehension. It is useful in terms of helping teachers to identify whether or not these skills are secure and more generally informing the approach to intervention. However, it does not break down the development of word recognition into aspects such as the development of visual discrimination, visual memory, auditory discrimination and development within phonological awareness. Additionally, it does not identify the elements which make up linguistic comprehension. The phonics screening check has placed an emphasis on assessing children's word recognition skills through decoding print at the level of

the smallest unit of sound (synthetic phonics) and therefore this is the strategy which teachers use to assess word recognition skills in the SVOR.

There is clear evidence that a systematic approach to phonics produces gains in word reading and spelling. However, there is inconclusive evidence to suggest that no one method of teaching children to read is superior to any other method. This has significant implications for educational practice and particularly in relation to assessment of word recognition skills. Given that no single instrument can assess all the aspects which need to be examined by practitioners, schools should develop an assessment battery which assesses children's knowledge and skills in reading development. If the skills of blending and word recognition are not developing through synthetic phonics schools should consider teaching children analytic phonics through a systematic approach. If the approach to teaching phonics changes schools will also need to develop an alternative assessment battery which matches the grain sizes that are being taught. To use a colloquial phrase, there is little point in flogging a dead horse. If children fail to learn to read through synthetic phonics it is counterproductive to continue with this approach. Analytic phonics is based on larger grain sizes of sound and the assessment battery would therefore need to include rimes. Continually assessing struggling readers using an assessment tool which is based on synthetic phonics will potentially damage children's self-concept.

Additionally, given that children with dyslexia and autistic- spectrum conditions often rely on visual strategies, more research is needed on the effectiveness of systematic phonics instruction compared to whole word methods for these learners. Although it must be acknowledged that whole word methods do not give learners strategies for identifying new words it is likely that one size does not fit all. These learners may require a different approach to teaching them how to read and hence a different form of assessment.

It is essential that children, who are not secure in word recognition skills by the age of 7, receive some additional and systematic form of intervention to support their

reading development. Whether schools adopt a different type of phonics, or indeed a phonics approach at all, should be a question of professional judgement and depends largely on the specific needs of the individual child. In these cases, it might be more appropriate for schools to develop a different assessment **battery** which assesses children's skills in auditory attention, auditory discrimination, visual discrimination and visual memory. These pre-reading skills form the basis of reading development.

The skill of word recognition requires both auditory and visual discrimination skills. Children need to visually discriminate between the shapes of graphemes and words in addition to enunciating sounds. They also need to develop the skill of committing a grapheme or a whole word to their memory. Children with poor short term memories may struggle to retrieve information from their memory and this will impede children's development in word recognition. Developing visual skills, including the development of visual memory, might be necessary even if auditory skills are secure. An assessment **battery** which assesses visual discrimination might include, for example, whether children are able to visually discriminate the odd one out from a set of objects. This skill could developmentally be assessed using photographs, line drawing or silhouettes in that sequence. The skill of visual memory could be assessed in relation to whether children are able to recall two objects which are shown then subsequently hidden from the child. The range of objects could gradually be extended and then finally the skill of visual sequential memory could be assessed to identify whether children are able to memorise the objects and their corresponding order within a set. All of these skill are pre-requisite skills for reading.

The skill of blending at phoneme level (phonemic awareness) is developmentally quite an advanced skill. A focus on assessing phonemic awareness might not target the core areas of deficit. It is possible that poor phonemic awareness is evident because *phonological awareness* is insufficiently developed. Phonological awareness includes an awareness of whole words, syllables and rimes. These are larger grain sizes than phonemes but from a developmental perspective it is easier

for children to process larger grain sizes before moving on to the smallest units of sound (i.e. phonemes). Children who are struggling to process sound at the phoneme level need to be assessed on their ability to process larger grain sizes in order to determine whether they need intervention in the area of phonological awareness. Developmentally the skills which contribute to phonological awareness include compound word blending and segmenting, syllable blending and segmenting and onset and rime blending and segmenting. This is a logical order for skills progression. After onset and rime blending and segmenting has been established it is then possible to focus on phoneme blending and segmenting.

Phillips, Kelly and Symes (2013) have identified specific skills which need to be assessed in order to determine whether children have reading difficulties. These skills are grouped under broader categories which are summarised below:

Decoding: grapheme-phoneme correspondence; regular and irregular word reading; non-word reading.

Behavioural: passage reading – fluency and comprehension.

Cognitive: short-term memory; working memory and phonological awareness (blending and segmenting).

Reasoning: verbal and non-verbal reasoning.

Processing: auditory processing; visual processing; speed of processing.

(Phillips, Kelly and Symes, 2013)

This framework for assessment could provide a more comprehensive assessment of the components of reading development and would more usefully inform the correct approach to intervention than the phonics screening check which only assesses the skill of decoding. However, it could be argued that the skills of developing phonological awareness should be sub-divided into compound word blending and segmenting, syllable blending and segmenting, onset and rime blending and segmenting and phoneme blending and segmenting. Additionally, the skill of visual processing should be sub-divided into the component skills of visual attention, visual discrimination, visual memory and visual sequential memory.

An effective assessment battery in reading should include an assessment of the pre-reading skills identified above. It should include the development of auditory and visual discrimination, phonological awareness and visual memory. It is only through developing a more detailed assessment battery which assesses children's pre-reading skills that teachers will then be able to target the teaching to match the area of need for those children whose word reading skills are not secure by the age of 7. Within each of these areas there are sub-component skills which need to be assessed. It is possible that intervention through a phonics-only approach will compound a sense of failure and result in teaching which is not developmentally appropriate. Different types of teaching and more comprehensive assessment batteries need to be developed to address different stages of development in reading. Given the inconclusive evidence in relation to synthetic phonics an assessment tool which just assesses children's skills in this aspect of phonics, such as the phonics screening check, is not fit purpose.

Although this suggested assessment battery may usefully support teachers in identifying deficits in pre-reading skills it does not capture the complex process of learning to read. Research has consistently indicated that the effective teaching of reading uses a balance of phonics and meaning-focused approaches to teach children to read (Pressley et al., 2001; Taylor and Pearson, 2002, Hall, 2013). Linguistic comprehension is critically important to reading development and this is developed through access to a broad and rich language curriculum. The role of oral language in reading development has been highlighted by Clemens et al (2016) who have emphasised that early language skills form a building block for subsequent reading development, including the development of phonological and phonemic awareness. They have also emphasised the importance of vocabulary knowledge in facilitating reading comprehension (Clemens et al, 2016). A comprehensive assessment battery would therefore need to break down the composite skills of linguistic comprehension as well as identifying the component skills of visual attention, visual discrimination, phonological awareness and phonemic awareness in

order to provide teachers with diagnostic information which would inform their teaching.

Given the above discussion, a suggested assessment battery for assessing reading development might be presented as follows:

Table 1: possible assessment battery for assessing reading development

Skills	Sub-component skills	Possible assessment tasks
Visual skills	Visual Processing -Visual attention -Visual discrimination -Visual memory -Visual sequential memory	-Looking at an object -Odd one out activities from a set of objects. Then progress to miniature objects, photographs, line drawings and silhouettes. Sorting and matching activities. Kim's Game Kim's Game
Vocabulary development	-Understanding everyday vocabulary -Noun vocabulary -Verb vocabulary -Abstract vocabulary e.g. adverbs, adjectives	Language games
Phonological Awareness	Auditory Processing -compound word blending and segmenting -syllable blending and segmenting and speed of processing -Phoneme-grapheme correspondence and speed of processing -onset and rime blending and	Listening games

	<p>segmenting and speed of processing</p> <ul style="list-style-type: none"> -consonant-vowel-consonant <p>blending and segmenting where vowels and consonants are digraphs</p> <ul style="list-style-type: none"> -consonant-vowel-consonant <p>blending and segmenting (real and non-words) including speed of processing</p> <ul style="list-style-type: none"> -Reading irregular words and speed of processing 	
Phonological awareness	<p>Sound identification</p> <ul style="list-style-type: none"> -awareness of rhyme -detection of rhyme -generation of rhyme -initial phoneme identification -final phoneme identification -medial phoneme identification -All through the word phoneme identification 	Rhyming games
Phonological awareness	<p>Rhythm</p> <ul style="list-style-type: none"> -keep a steady beat -copy simple rhythms -syllable awareness -Identify number of syllables in words 	<p>Clapping a beat</p> <p>Clapping/ tapping a rhythm</p> <p>Clapping out words</p> <p>Counting syllables in words</p>
Fluency (passage reading)	<ul style="list-style-type: none"> -Fluency -Comprehension 	<p>Passage reading and responding to questions about the text</p> <p>Miscue analysis for identifying errors and strategies that children are using.</p>

It is anticipated that this suggested framework will provide a starting point for discussion and debate amongst the academic community. Whilst it is acknowledged that elements of reading development may not have been captured in this framework, nevertheless the battery of assessment tasks suggested here offer an approach to assessing reading which acknowledges children's development in reading. This is in stark contrast to the phonics screening check which only assesses the skill of decoding, thus neglecting the sub-component skills that contribute to the development of decoding. It is anticipated that academics will debate this model and recommend that elements be added or removed.

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