

Current Debates over the Teaching of Phonics

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Article in *Oxford Research Encyclopedia of Education*, published online:
18 July 2022

<https://doi.org/10.1093/acrefore/9780190264093.013.1543>

Summary

Phonics is a method of teaching people to read and spell (and therefore write) in an alphabetic writing system by associating symbols (letters/graphemes) with sounds (phonemes). The place of phonics in teaching children to read and spell is vigorously debated amongst researchers, often spilling over into the popular press. Advocates of principally comprehension-based (e.g., whole language) teaching have maintained that little or no phonics instruction is needed; others are of the view that it is essential and must be systematic. Analysis of the most rigorous evidence from research reviews and meta-analyses suggests that systematic phonics teaching is effective for teaching children to read and spell in English, and that the combination of systematic phonics teaching and comprehension-based approaches is probably more effective than either alone. Research has therefore begun on integrated teaching of literacy that incorporates both code and meaning emphases, but currently the requisite professional knowledge and teacher capacity are challenges for many school systems.

The principal forms of phonics teaching are synthetic, where children are taught to sound out the letters of a word, and to blend (synthesize) the sounds together to form a word; and analytic, in which sounding-out is not taught to start with, but children identify the phonic element from a set of words in which each word contains the element under study, for example, *pat*, *park*, *push*, and *pen*. There is not yet sufficient convincing research evidence to decide which of these is more effective. Systematic phonics teaching in general is effective across the primary age-range, for normally-developing and most at-risk children, and probably for children whose first language is not English; and its effects last, at least in the crucial early years. Nonetheless, government policy and reform interventions in this area are sometimes heavy-handed, are frequently influenced by political and community pressure, and may face difficulties of scale, resources, and implementation that hamper their effectiveness and generalisability across school systems. A new, large systematic review may be needed to clarify various outstanding issues.

Keywords: phonics teaching, synthetic phonics, analytic phonics, systematic phonics, comprehension-based approaches, effectiveness, government policies, professional knowledge

Subjects: Curriculum and Pedagogy, Educational Purposes and Ideals, Educational Systems, Educational Theories and Philosophies

Introduction

The so-called reading wars between advocates of phonics and of whole language which used, like Etna, to erupt back into life periodically, especially in the United States, with related skirmishes elsewhere in the English-speaking world, seem to have simmered down. (However, Bowers, 2020 and Solity, 2020 retain the “phonics versus whole language” terminology.) A point appears to have been reached amongst teacher educators and literacy researchers where phonics teaching is generally accepted as one essential part of a broad and rich language and literacy curriculum, and that many approaches to phonics and emphases on meaning and experiential and constructivist learning are no longer viewed as mutually exclusive, or as an either/or curricular and instructional decision. The principal claim here is that, because learning to read and spell is not a natural process, as is learning to speak and understand, it requires effective curriculum and instruction. Writing is an historical human technology, with specific and identifiable cultural, linguistic and cognitive

codes, techniques, skills and practices. If an echo of the reading wars persists, it may reside in the question of whether phonics teaching must be systematic (as in “structured literacy”) or need only be incidental (as in “balanced literacy”). For descriptions of programmes of both these types, weighted in favour of structured literacy, see “An Explanation of Structured Literacy, and a Comparison to Balanced Literacy” at <https://iowareadingresearch.org/blog/structured-and-balanced-literacy>. This suggests a question that deliberately moves past the polarized either/or curriculum debate: that is, if “nothing but phonics” and “no phonics” are now rejected, and a middle path is to be found, how is the phonics teaching to be integrated with the rest of the literacy curriculum?

To approach these and myriad other scientific and educational questions raised about the teaching of phonics, this article is an overview of work in the field based on systematic and technical reviews. The aim throughout is to move from general to particular claims, using the most rigorous available analyses, while also acknowledging gaps and omissions. The emphasis is on the teaching of phonics in English.

Following established conventions for notation, in this piece phonemes are represented using International Phonetic Alphabet (IPA) symbols in double forward slashes, e.g., /æ/, and graphemes are shown in paired angle brackets, e.g., <a>. In some quotations, where informal indications of phonemes using ordinary letters appear in the original, they have been replaced by the appropriate IPA symbols. In order to use IPA, this article is written in Lucida Sans Unicode font.

Following some necessary definitions of phonics and reading comprehension, the possible contributions of both to literacy learning are theoretically framed within what is widely referred to as the *Simple View of Reading* (Gough and Tunmer, 1986). I then consider whether phonics instruction is effective and, if so, how effective it is, whether non-phonics-based approaches work just as well as phonics, and indeed whether the combination of systematic phonics and non-phonics-based approaches is more effective than either alone. The first two major conclusions are that:

- Systematic phonics teaching is effective for teaching children to read and spell in English
- The combination of systematic phonics teaching and literature-/meaning-based approaches is probably more effective than either alone.

Two main challenges to the first of those conclusions have been mounted; both are considered and dismissed.

The article then turns to address a series of subordinate questions:

- For whom is phonics teaching effective, and at what stages?
- Do any non-phonics-based approaches work as well as, or better than, phonics for **struggling** readers?
- How is phonics teaching to be integrated with the rest of the literacy curriculum?
- Which type of phonics?

I then pivot to discuss attempts to implement phonics programmes in national and regional educational systems. In England, systematic synthetic phonics is mandatory and enforced. In the US, *Reading First* was a costly failure, and the *Common Core State Standards* are muddled over basic linguistic facts. My concern here is to query whether the statutory mandating of phonics has indeed been “evidence-based”.

The last five sections consider various practical implications:

- Do varieties of phonics other than synthetic and analytic have a role to play?
- Where should phonics teaching start?
- Is phonics appropriate for adult learners?
- What should teachers know in order to teach phonics most effectively?

- Where next? Integrated teaching of initial literacy which **systematically incorporates both code and meaning emphases.**

I conclude with a case for further research: specifically, a large new systematic review encompassing all available studies.

What Is Phonics?

It is essential to start by defining phonics, because the numbers of studies included in systematic reviews concerned with phonics teaching range between 11 and 85 (see Table 2). Definitions, and therefore inclusion and exclusion criteria, have varied significantly; and some pedagogical practices that hardly count as phonics have been included in some reviews. Phonics is a method of teaching people to read and spell (and therefore write) in an alphabetic writing system by associating symbols (letters/graphemes) with sounds (phonemes). Note the inclusion of “and spell”: many definitions overlook this, and may therefore imply that phonics is used only to teach reading, but the correlations between phonemes and graphemes are reciprocal, and can and should be used in teaching both skills. Phonics so defined, its advocates explain, should be used predominantly in the initial stages of teaching literacy, but it is also widely used to help children who continue to struggle when most of their peers have “cracked the code” and begun to self-teach (Share, 1995).

Among practices which have been classified as “phonics” but which the definition used here is designed to exclude are, for example: orally syllabifying written English polysyllables and raising a finger for each syllable identified (Bhattacharya and Ehri, 2004); hearing an auditory stimulus (a meaningless Finnish syllable) via headphones, and then choosing the corresponding written syllable as quickly as possible from five options on a computer screen (Heikkilä et al., 2013); focusing on increasing awareness of the morphological structure of English words, with particular attention to the orthographic rules that apply when suffixes are added to the base word (Kirk and Gillon, 2009). While none of the authors of these studies themselves described their techniques as phonics, they are included in a systematic review by Galuschka et al. (2014).

It is also necessary to distinguish phonics instruction from instruction designed to enhance phonemic awareness (PA), which is here taken as a separate research topic. The first systematic review of the empirical evidence on the effectiveness or otherwise of PA instruction was part of the work of the (US) National Reading Panel (2000), and was most fully reported in Ehri, Nunes, Willows, et al. (2001). Ehri, Nunes, Willows, et al. (2001, p.253) defined PA as “the ability to focus on and manipulate phonemes in spoken words”, and went on to explain (pp.253-254) that

Some forms of PA instruction would qualify as phonics ... What distinguished PA studies from the general pool of phonics studies, however, is that instruction given to students in the [subset of PA studies which would qualify as phonics] was limited to grapheme-phoneme manipulation and did not go beyond this to include other activities such as reading decodable text or writing stories.

That disclaimer notwithstanding, the studies involving grapheme-phoneme manipulation definitely qualify as phonics, and are so considered here. This stance is compatible not only with the general definition of phonics given above, but also with the distinction drawn by Suggate, who states (2010, p.1577) “The crucial difference between PA and phonics instruction is that the latter includes teaching of the alphabetical principle (i.e., the relationships among letters, words, and sounds).” In a more recent article Suggate (2016, p.82) goes on to classify interventions as “phonics, if they contained a phonics component with or without an additional PA component”. Similarly, the (US) National Literacy Panel decided that

Instruction in phonemic awareness, accompanied by the teaching of written letters ..., may be considered as part of phonics instruction because phonics involves knowledge of the relationship between phonemes and their written representations. (Shanahan and Beck, 2006, p.425)

Phonics is intended to teach learners to identify and understand written words by realising that the words they see are already known to them in spoken form (reading); and to represent words they know and wish to write with marks on the page (spelling/writing). An implication is that phonics may be less appropriate, at least initially, for teaching literacy to children who do not (yet) speak the language in which they are being taught to read, spell, and write; this seems to go unremarked in the literature except (implicitly) by Bernhardt (1991, p.174):

In a monolingual setting, the point of departure for reading is the child's oral vocabulary... [C]hildren are taught to learn to read words with which they are already familiar in their spoken form. In a bilingual/immersion setting ... the teacher has to provide oral vocabulary first and then can teach the written forms... [W]hen children from a monolingual setting approach reading they have already spent five or six years practicing and learning an extensive oral vocabulary; children in a bilingual setting must ... begin again building ... oral renderings of previously held concepts, followed by learning these words in printed form.

Despite this, the practice of teaching second-language learners identically to native-speaking children appears to be widespread, and there are numerous studies of the use of phonics with second-language learners (see the section headed "Children whose first language is not English acquiring literacy in English"). This makes it all the more important that, as the *European Union High Level Group of Experts on Literacy* urged, every child should enter school speaking the language of the school (European Commission, 2012, pp.24–25), and governments should provide the resources to ensure that this is so.

In the studies reviewed here, the principal research question is whether systematic phonics instruction is more effective than unsystematic or no phonics instruction. In systematic phonics schemes, correspondences between letters and sounds are taught in a planned sequence, mainly at the segmental (phoneme and grapheme) level. The correspondences cover both consonant and vowel phonemes, and a judicious selection of frequent and useful graphemes from among the nearly 300 present in English orthography (Brooks, 2015). Initially, single-letter graphemes predominate, but some frequent digraphs need to be introduced early (e.g., <ch, sh, th>), as do certain high-frequency irregular words (especially *the, a, of*). Some schemes also teach consonant clusters (e.g., *bl*) and/or syllable rimes (e.g., *ing*) as units. Unsystematic phonics teaching does not use planned sequences, but incidental or "only when needed" instruction of particular correspondences. "No phonics" should speak for itself.

Reading Comprehension

Since "Reading is making sense of print" (Moustafa, 1997, p.6), and phonics is a means to that end, as soon as a child is able to vocalize one printed word, recognize it as part of his/her spoken vocabulary, and therefore understand it, reading comprehension can be said to have begun. However, the term is more generally used to mean understanding at least a printed sentence or two, and this type of definition underlies the use of the term here. Suggate (2010, p.1558) lists the forms of comprehension- or meaning-based instruction that the studies he analyzes cover:

[C]omprehension or meaning interventions tend to involve instruction in some form of meta-cognitive skills and thinking, with specific techniques, such as strategy use, inferential questioning, reflecting, question generation, listening, mental imagery, pictorial aids, mnemonics, prior knowledge, story structure, and summarization.

Theoretical Framing

The *Simple View of Reading*, first put forward by Gough and Tunmer (1986), is encapsulated in diagrams such as that shown in Figure 1.

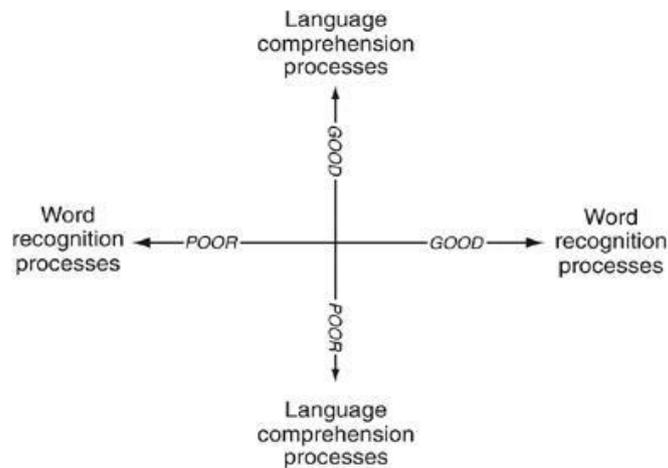


Figure 1. The Simple View of Reading
Source: Rose (2006, p.77) (Crown copyright)

That is, the processes underlying word recognition and language (listening) comprehension are held to be conceptually distinguishable, yet both essential to the acquisition of reading comprehension. The interrelation of the two is formalized in the equation $R = D \times C$, standing for “Reading Comprehension is the product of Decoding and Language Comprehension”. Unlike its more frequent but restricted meaning of “sounding out”, Gough and Tunmer intended “decoding” to mean “recognition of printed words,” however achieved. Two further caveats are that (1) the relationship between the two sets of processes was explicitly conceived of as multiplicative, not additive, since low ability in either will cause poor reading comprehension; and (2) the “simple view” only refers to this initial conceptualisation – there is no reason to believe that reading itself is simple, and every reason to believe that it is highly complex. The 10-year *Reading for Understanding Initiative* in the United States (Pearson et al., 2020) investigated and illuminated this complexity, and in particular put forward modifications of the Simple View to accommodate reading comprehension in the teenage years.

The strengths of the Simple View model were expressed as follows in the Rose Report (Rose, 2006, pp.77-78):

We believe that the simple view of reading provides a valid conceptual framework that is useful to practitioners and researchers alike. Clear differentiation between the two dimensions provides a conceptual framework that:

- (a) encourages teachers not necessarily to expect that the children they teach will show equal performance or progress in each dimension;
- (b) offers the possibility of separately assessing performance and progress in each dimension, to identify learning needs and guide further teaching;
- (c) makes explicit to teachers that different kinds of teaching are needed to develop word recognition skills from those that are needed to foster the comprehension of written and spoken language; and
- (d) emphasizes the need for teachers to be taught about and to understand the cognitive processes involved in the development of both accurate word recognition skills and of language comprehension.

This framework underlies the structure of Stuart and Stainthorp’s (2016) book *Reading Development & Teaching*, and the analysis here of the effectiveness of phonics and

comprehension-based teaching. In particular, it raises the key question of whether phonics instruction and comprehension-based teaching support differential or interacting effects.

Is Phonics Teaching Effective?

As with PA, the first systematic review of the impact of phonics teaching was the work of a (different but overlapping) National Reading Panel subgroup also chaired by Linnea Ehri (Ehri, Nunes, Stahl, and Willows, 2001). The review covered the experimental evidence on phonics instruction for children in kindergarten and grades 1-6 (UK school years 1-7, ages 5-12). Based on 38 studies comparing systematic phonics instruction and unsystematic or no phonics instruction the authors produced 66 statistical comparisons; their principal findings on the effectiveness of phonics instruction were as shown in Table 1.

Table 1: Ehri, Nunes, Stahl, and Willows’s (2001) **Principal Mean Effect Sizes, for Literacy Overall, Reading Accuracy*, Comprehension, and Spelling**

Outcome measure	Mean effect size**	N of cases***
Literacy overall	0.41	65
Reading miscellaneous words	0.40	59
Decoding regular words	0.67	30
Decoding pseudowords	0.60	40
Comprehending text	0.27	35
Spelling words	0.35	37

Source: Ehri, Nunes, Stahl, and Willows (2001, Table 1, pp.404-405)

* “Reading accuracy” is used here and throughout as a portmanteau term comprising reading miscellaneous words, and decoding both regular and pseudowords.

** Here and throughout, the effect sizes shown are those reported by the authors; an effect size is an estimate of the strength of the difference in scores between two independent groups.

*** Here and throughout, “N of cases” means the number of statistical comparisons contributing to a particular effect size.

Ehri, Nunes, Stahl, and Willows’s major conclusion was that systematic phonics teaching helped children to learn to read (and spell) better than if their instruction included unsystematic or no phonics.

That conclusion has been subject to two main challenges. First, using almost the same set of studies, Camilli et al. (2003, 2006) reanalyzed Ehri, Nunes, Stahl, and Willows’s dataset twice, and found much smaller effect sizes. However, Stuebing et al. (2008, p.125) concluded that Ehri, Nunes, Stahl, and Willows’s

... NRP report and Camilli et al. (2003) ask different questions. The NRP question is analogous to asking about the value of receiving the intervention versus not receiving the intervention. The Camilli et al. (2003) report is analogous to asking what is the value of receiving a strong form of the intervention compared to receiving weaker forms of the intervention and relative to factors that moderate the outcomes.

Ehri, Nunes, Stahl, and Willows’s overall findings were based on main effects without allowing for moderator variables, so it was unsurprising that Camilli et al. reached different conclusions. For present purposes, however, it is the main effect of systematic phonics versus unsystematic or no phonics that is my principal focus.

Secondly, Bowers (2020; cf. rejoinders by Buckingham, 2020 and Fletcher, Savage and Vaughn, 2020) has disputed whether “systematic versus unsystematic or no phonics” is the correct comparison. He maintains that the inclusion of “no phonics” is invalid, and that the only valid comparison is between systematic and unsystematic phonics. He relies heavily on the Camilli et al. (2003, 2006) re-analyses of the Ehri, Nunes, Stahl, and Willows (2001) dataset. Camilli et al. attempted, *inter alia*, to code the control groups as having received “no phonics” or “unsystematic phonics” versus the “systematic phonics” received by the

intervention groups. The rubric for this is given in Camilli et al. (2003, Table 2, p.15) as follows:

ng	No information in study to infer code.
0	No specific phonics intervention was given. In most cases, we know that it is highly probable that students received some kind of phonics activity, especially for longer interventions. Moreover, even if no phonics instruction was associated with the treatment delivered, it may have been the case that other instructional activities (external to the treatment) included phonics. In short, we were not able to distinguish among these possibilities.
1	Treatment specifically included phonics activities, but treatment activities were not described in detail as being direct, systematic instruction. Organized phonics were embedded in language instruction.
2	Treatment was described as including direct, systematic phonics instruction. It was most often the case that this description specifically included blending.

Given the presence of the “Not given/No information” line and code, the statements in the “No phonics” box could be taken to mean that, for a particular group’s experience to be coded 1, a project description would have to include an explicit statement that that group’s instruction did not include any phonics. This would be the plain interpretation of the first sentence in that box – but the remainder of the description appears to confuse this by saying, in effect, that phonics may have been happening anyway. Moreover, on the page following their Table 2 the authors say: “We converted ‘not given’ responses to zeros.” This seems to mean that, when Camilli et al. analyzed systematic phonics versus no phonics, the latter category included not only clear instances of “No phonics” but also cases where they could not be certain whether or not phonics instruction was occurring. This would seem to nullify the attempt to distinguish “no phonics” from “unsystematic phonics”. If so, it would justify Buckingham’s (2020, p.107) description, in her rejoinder to Bowers (2020), of the distinction as “nebulous”.

However, even if this conceptual rejection of Camilli et al.’s (2003) coding of systematic/some/no phonics is itself rejected, there is also a statistical counter-argument. Stuebing et al. (2008) took Camilli et al.’s codings at face value, and arrived at unmoderated effect sizes for systematic versus unsystematic or no phonics which were close to Ehri, Nunes, Stahl, and Willows’s original values. I conclude that the use of the “systematic versus unsystematic or no phonics” comparison by Ehri, Nunes, Stahl, and Willows (2001) and all subsequent meta-analysts except Camilli et al., and in this article, is justified.

That conclusion applies in particular to the work of Torgerson et al. (2019), who conducted a “tertiary review,” a systematic review of systematic reviews of phonics. While they did not themselves reach overall conclusions on the effectiveness or otherwise of phonics instruction, their article can be extrapolated and supplemented to that purpose. Table 2 shows unmoderated main effect sizes for the impact of phonics on literacy overall, and on various aspects of literacy, gleaned from seven of the 12 systematic reviews included in Torgerson et al. (2019). (Camilli et al., 2003, 2006 are omitted because they did not report unmoderated main effects, and Hammill and Swanson, 2006 because they merely reiterated those from Ehri, Nunes, Stahl, and Willows, 2001. Han, 2009 is omitted because no relevant data can be extracted from it. For Adesope et al. (2011) see the section headed “Children whose first language is not English acquiring literacy in English.”) Swanson et al., 1999 (not included either in Torgerson et al., 2019 or here) is excluded because the authors provided no meta-analyses of the overall effect of phonics.

Also included in Table 2 are relevant data from four studies not included in Torgerson et al. (2019): from Ehri, Nunes, Willows, et al. (2001), their finding for “use of letters” where letters were manipulated, that is, phonics; from the (US) National Early Literacy Panel (2009) report, data for kindergarten (but not for prekindergarten) children; data from Table 2 of the McArthur et al. (2018) update of McArthur et al. (2012); and data on the (lack of) impact of Orton-Gillingham phonics teaching from Stevens et al. (2021).

Table 2: Main effect sizes for impact of phonics teaching from 11 systematic reviews

Authors (see key below)	Ehri ^a	Ehri ^b	Torg ¹	Sher ²	NELP	Sug ^{2,3}	McA 12 ^{1,2}	Gal ^{1,2,3}	Sugg ³	McA 18 ^{1,2}	Ste ²
Age-ranges (see key below)	K-G6	K-G6	K-G6	G5-12	K	pK-G7	K-G12	K-G12	K-G7	K-G12	K-G12
Overall N of studies	52	38	12	26	83	85	11	22	16	12	16
Outcome measure											
Literacy overall	0.89 39	0.41 65		0.33 11		0.50 36		0.32 29	0.26 22		(0.32) 15
Reading miscellaneous words		0.40 59	0.27 12		0.43 30	0.42 34	0.47 10	0.322 29	0.45 16	0.48 11	
Decoding regular words		0.67 30									
Decoding irregular words										0.82 4	
Decoding pseudowords		0.60 40					0.76 8			0.68 10	
Comprehending text		0.27 35	(0.24) 4			0.41 20	(0.14) 3		0.48 4	0.23 5	
Spelling words		0.35 37	(0.09) 3		0.58 13		(0.36) 2	0.336 10	0.27 5	(0.28) 3	
Vocabulary and comprehension											(0.14) 10

Notes: The numbers in red are the numbers of cases contributing to the effect sizes above them

Effect sizes in brackets were statistically non-significant; all others were significant at $p < 0.05$ or better

¹ Used only RCTs; other meta-analyses listed used both RCTs and quasi-experimental studies

² All participants in studies analysed were struggling readers

³ Includes some studies in languages other than English

Sources: For Ehri ^a, Ehri et al. (2001a, Table 2, p.261); for NELP, NELP (2008, Table 3.3, p.111); for McA 18, McArthur et al. (2018, Table 2, fixed effects); for Ste, Stevens et al. (20-21, pp.14-15); for all others, Torgerson et al. (2019, Table 3, pp.217-225)

Key to authors: Ehri ^a = Ehri et al. (2001a); Ehri ^b = Ehri et al. (2001b); Torg = Torgerson et al. (2006, fixed effects); Sher = Sherman (2007);

NELP = National Early Literacy Panel (2008); Sug = Suggate (2010); McA 12 = McArthur et al. (2012); Gal = Galuschka et al. (2014);

Sugg = Suggate (2016); McA 18 = McArthur et al. (2018); Ste = Stevens et al. (2021)

Key to age-ranges: pK = pre-kindergarten (age 4); K = kindergarten (age 5); G = US grades 1-12 (ages 6-17)

Where relevant information was not available, cells in Table 2 are left empty. The numbers in red are the numbers of cases contributing to the effect sizes above them; where these numbers exceed the overall number of studies (as for literacy overall under Ehri, Nunes, Stahl, and Willows, 2001), multiple effect sizes were calculated per study. Because all eleven reviews were sampling parts of the same overall domain, there is considerable overlap in the studies covered. A case in point is that 10 of the 11 randomized controlled trials (RCTs) covered in McArthur et al. (2012) feature again among the 12 covered in the McArthur et al. (2018) update.

Taken together, the data in Table 2 provide strong evidence of the benefit of systematic phonics instruction for literacy overall and for reading accuracy. The evidence of benefit to reading comprehension and spelling is based on fewer comparisons but, despite the few non-significant findings, most of which are based on small numbers of cases, seems strong enough to infer that phonics benefits these skills too. The non-significant findings of Stevens et al. (2021) seem to be outliers, perhaps due to their analyses being based on the impact of only one type of phonics programme. These results do not seem to overturn the general picture. The present analysis therefore provides counter-evidence to the claim of Garan (2001) and Krashen (2009, 2017) that phonics only benefits decoding, with limited transfer to comprehension, spelling and other literate performances.

Do Non-Phonics-Based Approaches Work Just as Well as Phonics, or Perhaps Even Better?

Some influential critics of systematic phonics and advocates of approaches involving little or no phonics have maintained that systematic phonics is no more effective than, possibly less effective than, meaning-based approaches. Most of the systematic reviews of phonics do not provide comparative data on other approaches. However, useful findings are provided in Suggate's (2016) review, which covers phonics, comprehension-based, and mixed approaches (also PA, not relevant here). He analyzed 16 studies providing 71 comparisons. Of the 71 comparisons, 43 came from studies of phonics in English, and 28 from other

languages (not listed, but including Spanish); there is no way of separating these out, but the overall data for English versus not in his Table 1 (p.85) seem sufficiently alike to take them together. Data from this review are therefore quoted in Table 3 as if entirely relevant to English.

Table 3: Impacts of Phonics, Comprehension-based and “Mixed” Instruction on Literacy Overall, Reading Accuracy, Comprehension, and Spelling (Suggate, 2016)

Impact of	on	Effect size	N of cases
Phonics teaching	Literacy overall	0.29	22
	Reading accuracy	0.26	16
	Comprehension	0.47	4
	Spelling	0.38	5
Comprehension-based approaches	Literacy overall	0.38	11
	Reading accuracy	0.26	3
	Comprehension	0.38	10
	Spelling	0.54	2
“Mixed” approaches	Literacy overall	0.52	9
	Reading accuracy	0.46	9
	Comprehension	0.52	8
	Spelling	0.44	3

Note: No relevant statistical significances reported.

Source: Weighted effect sizes from Suggate (2016, Table 3, p.86).

There seem to be few important differences between the impacts of phonics and comprehension-based approaches, though some of the effect sizes are based on tiny numbers of cases. Further, note that these data cover the entire age-range from kindergarten to grade 7, and an analysis of trends across year-groups (see the section headed “For normally-developing and at-risk children”) suggests an explanation for the differences in impact. These data provide little support for those who hold that meaning-based approaches might be more effective than phonics.

Two other studies suggest that whole-language methods may in fact be less effective than systematic phonics. First, Chapman et al. (2001) collected evidence that reading difficulty rates were higher with whole-language methods than with systematic and explicit phonics. Secondly, Ehri, Nunes, Stahl, and Willows (2001, Table 1, p.406) give the following effect sizes favouring phonics, both statistically significant at $p < 0.05$:

Phonics versus whole word (“look-say”):	0.51	(N of cases = 10)
Phonics versus whole language:	0.31	(N of cases = 12)

Ehri, Nunes, Stahl, and Willows (2001, p.397) state that look-say, whole-word methods involved postponing phonics until children had acquired 50 to 100 sight words. For example, an initial whole-word phase was explicitly advocated in the *Handbook to the British Ladybird Books* reading scheme (Murray, 1969), which also (p.17) quoted the statistic (based on Table 16 in Kellmer Pringle et al., 1966, p.51, emphasis original) that

nearly 70% of the teachers interviewed [for the age 7 sweep of the National Child Development Study in Britain in school year 1962/63] do not use the sounds of letters (i.e., the “phonic” method) in the *initial* stages of learning to read.

Thus look-say, whole-word methods were the main alternative to phonics at the time of Chall’s (1967) *Learning to Read: the Great Debate*. Historically, whole language involved using whole texts and incidental phonics, and emerged as the main alternative to phonics beginning in the 1980s. So the two sets of studies analyzed by Ehri, Nunes, Stahl, and Willows (2001) would be from different, if overlapping, eras.

Is the Combination of Systematic Phonics and Comprehension-Based Instruction More Effective Than Either Alone?

Are combinatory approaches a viable and alternative solution? Though much misinterpreted as advocating only systematic synthetic phonics, Rose (2006) stressed the need to embed it in a broad and rich language and literacy curriculum. Torgerson et al. (2006, Table 1, pp.30-32, and cf. Appendix G, pp.64-65) described the control-group pedagogies used in the 12 RCTs they used in their meta-analyses: in all but one case (Torgesen et al., 1999), the control group received some variation of whole-language comprehension-based instruction. Moreover, the phonics which the intervention groups received had been **added** to that form of instruction, thus supporting the idea that the combination of the two is what was effective. Stuebing et al.'s (2008) re-analysis of Ehri, Nunes, Stahl, and Willows (2001) supported the idea that phonics instruction is more effective if it is part of a wider literacy programme, and they concluded (Stuebing et al., 2008, p.123) that "Camilli et al. (2003, 2006), and Hammill and Swanson (2006) do not contradict the NRP report, concurring in supporting comprehensive approaches to reading instruction."

Suggate (2016, p.82) defined the mixed approaches he analyzed as those "containing comprehension and a phonics or phonemic awareness component", and the results are also shown in Table 3. For literacy overall, reading accuracy, and comprehension the results for mixed approaches seem stronger than those of both phonics teaching alone and comprehension-based approaches alone.

There is, then, sufficient evidence for the following conclusions: *Systematic phonics teaching is effective for teaching children to read and spell in English. Furthermore, the combination of systematic phonics teaching and comprehension-based approaches is probably more effective than either alone.*

As Rose himself has commented: "Phonics is necessary but insufficient." (Rose, J., presentation to The Children's Literacy Charity day conference, London, 23 March 2018; cf. Brooks, 2003, p.6: "Phonics is necessary ... but not sufficient."). But is the benefit of phonics, alone or in combination with comprehension-based approaches, maintained across the board, that is, both in the initial stages and later; for normally-developing children and those who might or do struggle; and for children whose first language is not English acquiring literacy in English? And, supposing the answer to any of those questions is Yes, are the effects lasting and durable?

For Whom is Phonics Teaching Effective, and at What Stages?

Across the Primary Age-Range

The five reviews listed in Table 2 which used data from beyond grade 7 (Sherman, 2007; McArthur et al., 2012, 2018; Galuschka et al., 2014; Stevens et al., 2021) did not provide any breakdown by ages or grades. Indeed, Galuschka et al. (2014, p.5) said it was impossible because of overlaps in samples across studies – hence the restriction to the primary age-range in this section.

Besides their overall findings, Ehri, Nunes, Stahl, and Willows (2001) provided evidence that phonics is effective both in the early stages and (mostly) in grades 2-6, as shown in Table 4.

The diminishing impact of phonics on comprehension and spelling at grades 2-6 is explored in more detail in Suggate (2010) – see Table 6 and associated text.

Table 4: Ehri, Nunes, Stahl, and Willows’s (2001) **Mean Effect Sizes for Phonics by Grade Levels for Literacy Overall, Reading Accuracy, Comprehension, and Spelling**

Outcome measure	KG & grade 1 (ages 5-7)		Grades 2-6 (ages 7-12)	
	Mean effect size	N of cases	Mean effect size	N of cases
Literacy overall	0.55	30	0.27	32
Reading miscellaneous words	0.45	23	0.33	23
Decoding regular words	0.98	8	0.49	17
Decoding pseudowords	0.67	14	0.52	13
Comprehending text	0.51	11	(0.12)	11
Spelling words	0.23	13	(0.09)	13

Note: Effect sizes in brackets non-significant; all others significant at $p < 0.05$.

Source: Ehri, Nunes, Stahl, and Willows (2001, Table 1, pp.404-405).

For normally-developing and at-risk children

Once again, essential data were provided by Ehri, Nunes, Stahl, and Willows (2001): see Table 5. “At-risk” is their term; such children might more usually be described as “poor readers”. Ehri, Nunes, Stahl, and Willows (2001, p.398) defined what they called “reading-disabled children” as those “showing a discrepancy between IQ and reading level”, which refers to a type of definition of dyslexia which has since been discredited and mostly abandoned (but was still used by Suggate, 2010, p.1560 and 2016, p.82). By exclusion, “low achievers” were “poor readers whose cognitive abilities were either not assessed or were found to be below average”.

Table 5: Ehri, Nunes, Stahl, and Willows’s (2001) **Mean Effect Sizes for Phonics for Normally-Developing and At-Risk Children, by Age Group and Overall, and for Socio-economic Status (SES) levels**

Age	Status	Effect size	N of cases
KG-grade 6	Overall	0.41	66
KG and Grade 1	Overall	0.55	30
Grade 1	Normally-developing	0.48	14 *
KG	At risk	0.58	6
Grade 1	At risk	0.74	9
Grades 2-6	Overall	0.27	32
Grades 2-6	Normally-developing	0.27	7
Grades 2-6	At risk - low achievers	0.15 **	8
KG-grade 6	At risk - reading disabled	0.32	17
Socio-economic status	Low	0.66	6
	Middle	0.44	10
	Varied	0.37	14

* There was only one study using normally-developing kindergarteners; it was omitted from the relevant calculation.

** Non-significant; all other results significant at $p < 0.05$.

Source: Ehri, Nunes, Stahl, and Willows (2001, Table 1, pp.404-405), as tabulated (except for SES) by Davis (2018, Table 2.2, p.64).

These figures suggest that systematic phonics was effective for all groups except “low achievers” as just defined. Ehri, Nunes, Stahl, and Willows (2001, p.429) remark that, of the eight studies contributing to this non-significant result, only one provided tutoring, while the other seven relied on classroom instruction. The implication (which Ehri, Nunes, Stahl, and Willows do not state) might be that these “low achievers” were not being provided with the type of teaching they would have needed to make better progress.

As shown in Table 2, Sherman (2007), McArthur et al. (2012, 2018), and Galuschka et al. (2014) reported useful effects for struggling readers, but provided too little disaggregation to enable subgroup reporting.

Much more useful here are the findings provided in Suggate's (2010) review which, like his 2016 review, covers phonics, comprehension-based, and mixed approaches (also PA, again not relevant here), but focuses on poor readers rather than the full range of attainment. His definition of mixed approaches (p.1560) was the same as in his later article. He analyzed 85 studies providing 116 intervention group/control group comparisons. Twelve studies were conducted in languages other than English (Finnish, French, German, Hebrew, and Spanish); Suggate provides no means of separating these out, but reports (p.1563) that the English and non-English mean effect sizes did not differ significantly. His data are therefore quoted in Table 6 as if entirely relevant to English.

Table 6: Impacts of phonics, comprehension-based, and mixed instruction on literacy overall, reading accuracy, and comprehension for poor readers (Suggate, 2010)

Impact of	on	Effect size	N of cases
Phonics teaching	Literacy overall	0.50	36
	Reading accuracy	0.42	34
	Comprehension	0.41	20
Comprehension-based approaches	Literacy overall	0.58	37
	Reading accuracy	0.69	28
	Comprehension	0.60	21
"Mixed" approaches	Literacy overall	0.43	30
	Reading accuracy	0.43	26
	Comprehension	0.37	20

Note: No spelling data or relevant statistical significances reported.

Sources: Weighted effect sizes from Suggate (2010, Tables 1 & 2, pp.1563, 1564).

All three effect sizes for comprehension-based approaches are larger than the corresponding ones for either phonics alone or mixed approaches, but it must be borne in mind that these data cover the entire age-range from pre-kindergarten to grade 7. A regression analysis (Suggate, 2010, Figure 1) showed that the benefit of phonics was strongest in kindergarten, and slowly diminished across grades 1-4 (there were not enough studies at later grades to estimate effect sizes for phonics), while the benefit of comprehension-based and mixed approaches was lowest in kindergarten, and slowly increased across grades 1-7, the cross-over occurring in grade 2.

This is precisely the pattern that would be expected if phonics and the other approaches were making appropriate and separate contributions across the primary school years, and if phonics was being used principally as a *time-limited method of getting children started on literacy learning and understanding what they read*.

When considering how best to boost the achievement of poor readers, it is well to remember the cautionary note sounded by Duff and Clarke (2011, p.5):

In summary, a good understanding has been reached regarding how to ameliorate word-level weaknesses in children with dyslexic difficulties. Such interventions should entail training in phoneme awareness, letter knowledge, explicit and systematic instruction in phonics, and the application of these skills to the tasks of reading and writing. Notwithstanding this, there is a growing appreciation that even interventions that honour best practice are not effective for all children... Ongoing work is needed in order to understand the profiles of non-responders, and how interventions can be adapted to suit their needs.

Lavan and Talcott (2020, pp.197-212) analyze in detail the efforts of the premier British literacy research team (led by Maggie Snowling and Charles Hulme, originally at the University of York, latterly at Oxford University) to understand and mitigate the difficulties of the poorest readers, those whom phonics does not necessarily help but who must not be overlooked, and to prevent literacy difficulties arising in the first place.

Children whose First Language is Not English Acquiring Literacy in English

- known in the United States as English Language Learners (ELLs), in the United Kingdom as children with English as an Additional Language (EAL) or English as a Second Language (ESL). A pioneering study in this field was that by Bernhardt (1991) which included an analysis of the empirical database from 1973-90. However, she focused almost exclusively on developing reading comprehension, and her book contains no reference to phonics, and very little about the earliest stages of learning to read a second language. The absence of phonics is true in particular of the section on "Oral-Aural Factors" (pp.38-42) where reference to it might have been most likely. This appears to indicate that relevant research had not yet occurred, which would fit with Bernhardt's overall poor opinion of the existing research base.

The National Reading Panel in the United States was followed a few years later by the National Literacy Panel, whose report (August & Shanahan, 2006) focused exclusively on ELL/ESL children. For present purposes, chapter 15 (Shanahan & Beck, 2006) is crucial: it summarized what was considered to be the most reliable quantitative, empirical evidence on the effectiveness of various instructional approaches for such children. Because there was rather little evidence, the authors did not conduct any meta-analyses (and this study is therefore not included in Table 2). Their dataset on the effectiveness of phonics for ELL/ESL children included just four studies (three RCTs and one quasi-experiment), with sample sizes ranging from 33 to 194 (total = 446). Three of the studies had effect sizes in the range 0.29-0.48; the smallest study produced an outlier value of 2.82. Other authors might have conducted a meta-analysis here, but Shanahan and Beck refrained, mainly because they considered the dataset too small. A contributory reason (not stated by them) may have been that the three phonics approaches investigated were insufficiently alike for meaningful comparison.

The only meta-analysis included in Torgerson et al.'s (2019) tertiary review which reports exclusively on interventions for such children is that by Adesope et al. (2011). (The studies of interventions in other languages within Suggate, 2010, 2016 and Galuschka et al., 2014 are not relevant.) Adesope et al. report effect sizes for four intervention categories (collaborative reading, systematic phonics instruction and guided reading, multimedia-assisted reading, structured and diary writing), and for three outcome constructs (comprehension, decoding, mixed comprehension and decoding) – but, frustratingly, not for the effects of separate interventions on separate outcomes. Thus from their article just one relevant effect size is available: 0.40 (N of cases = 14) for the effect of phonics and guided reading teaching on literacy overall.

Some supplementary evidence is available from a qualitative literature review in a study also not listed in Table 2. Urbanová (2016) assembled a corpus of evidence on the use of synthetic phonics with ESL students learning to read English in a range of countries (Colombia, Germany, India, Nigeria), including Stuart's (1999) research in the East End of London in which 96 out of the 112 four- and five-year-old children had English as a second language (most were Sylheti speakers from Bangladesh), and from Urbanová's own research in the Czech Republic; the results were mainly positive.

There is a clear need for a new systematic review and meta-analysis of this field, especially since, of the 17 studies cited by Shanahan and Beck and the 20 cited by Adesope et al., only four are common to both.

Do the Effects Last?

It would be tempting to use the data in the subsections headed "Across the Primary Age-Range" and "For Normally-Developing and At-Risk Children" as evidence here – but misleading, because almost all the studies contributing to those data were cross-sectional, derived from different samples of children at each age. Only longitudinal data, derived from following and re-testing the same children over time, can justify inferences about whether effects are durable and sustainable.

Most such data come from follow-up testing of children within research studies. Ehri, Nunes, Stahl, and Willows (2001, Table 1, p.404) reported a mean effect size at follow-up (after intervals ranging from 4 months to one year) of 0.27 from just 6 cases, down from the mean effect size of 0.51 at immediate post-test for the same 6 cases – but the difference was not statistically significant. Among his 85 studies, Suggate (2010) found 21 with follow-up data gathered on average 15.5 months after the interventions concluded. The only direct comparison he reported (p.1566) was a decline in the mean effect size for all intervention types against all outcome measures: 0.50 at immediate post-test versus 0.36 at follow-up. No statistical test of the difference was reported.

More useful follow-up data are reported by Suggate (2016), as shown in Table 7. The average period of time between immediate post-test and follow-up was 11 months. The immediate post-test data are repeated from Table 3, and in theory all or most of the children whose data contributed were tested at both post-test and follow-up.

At follow-up the effects of phonics and mixed approaches had decreased, except for the effect of phonics on spelling, which showed a small increase, while all the effects of comprehension-based approaches had increased (except on spelling).

A hypothesis to account for this pattern would be that, as they grew, the children involved needed phonics less for reading (either accuracy or comprehension) but continued to need it for spelling, while comprehension-based approaches came into their own. Some support for this comes from Suggate’s (2016, p.86) note that the mean grade-level of the children receiving phonics instruction was 1.25, between kindergarten and grade 1, whereas for those receiving comprehension-based approaches it was 3.09, early in grade 3. If so, this would again suggest a cross-over pattern of the kind identified in Suggate (2010). Similarly, Slavin et al. (2009, p.1413) reported overall mean effect sizes for early reading instruction of 0.27 for decoding outcome measures and 0.20 for comprehension/total reading outcome measures, and then commented: “Comprehension measures were more likely to show positive effects in multiyear studies that followed children into second grade or beyond.”

Table 7: Impacts of Phonics, Comprehension-Based, and Mixed Instruction on Literacy Overall, Reading Accuracy, Comprehension, and Spelling at Immediate Post-test and at Follow-up (Suggate, 2016)

Impact of	on	Immediate post-test		Follow-up	
		Effect size	N of cases	Effect size	N of cases
Phonics teaching	Literacy overall	0.29	22	0.07	22
	Reading accuracy	0.26	16	0.07	20
	Comprehension	0.47	4	-0.10	8
	Spelling	0.38	5	0.46	5
Comprehension-based approaches	Literacy overall	0.38	11	0.46	11
	Reading accuracy	0.26	3	0.51	2
	Comprehension	0.38	10	0.46	11
	Spelling	0.54	2	0.51	2
“Mixed” approaches	Literacy overall	0.52	9	0.40	9
	Reading accuracy	0.46	9	0.38	9
	Comprehension	0.52	8	0.39	7
	Spelling	0.44	3	0.40	5

Note: No relevant statistical significances reported.

Source: Weighted effect sizes from Suggate (2016, Table 3, p.86).

A much longer time-span applies to the data from England reported by Machin, McNally, and Viarengo (2016, 2018). In 2005 the British government commissioned a pilot project on synthetic phonics, known as *The Early Reading Development Pilot*. This began in school year 2005/06 in 18 Local Authorities (LAs), and was rolled out across England (but not in the other three countries of the UK) in successive batches of LAs between 2006/07 and 2009/10, under the title *The Communication, Language and Literacy Development Programme*. The results of these programmes were analyzed by Machin et al. (2016, 2018), who also had access to national pupil attainment data in literacy at ages 5, 7, and 11; these data covered, in principle, every child of the relevant ages in the country. Using the

staggered roll-out, as shown in Table 8, to define a “natural experiment” with quasi-“treatment” and “control” groups, the authors were able to estimate the effect of introducing synthetic phonics on children’s attainment at all three ages.

Machin et al. concluded that there had been an across-the-board improvement at ages 5 and 7, but that at age 11 there was no overall effect. However, there were lasting effects at age 11 for children who could be considered as having been at risk of underachievement initially: children who entered school at risk of falling behind, those who were from disadvantaged backgrounds, and non-native speakers of English. These are precisely the groups targeted in such policy interventions. However, this result would also mean that there would have been a negative effect at age 11 for children who, at school entry, were **not** at risk of falling behind or disadvantaged or non-native speakers. It could be argued that it would be surprising if there had been a detectable overall effect at age 11, given the elapsed time since these children had received phonics, and the fact that by age 11 virtually all the children would have learnt to read. In particular, as pointed out by Buckingham (2020), by the time these children were 11, they had all received synthetic phonics teaching, so there was no longer any form of control group. The overall positive effects at ages 5 and 7 could be taken as useful evidence of effects lasting at least till age 7. This would fit with Suggate’s (2010) evidence summarized above.

Table 8: Group Allocation in Synthetic Phonics Roll-out in England, 2005-2010

Groups	Phonics Programme	LA	Entry	Birth Cohort of Students First Exposed to Programme	Year of Age 5 Assessment	Year of Age 7 Assessment	Year of Age 11 Assessment
Treatment Group 1	EDRp	Schools in 18 LAs	2005/06	2001	2006	2008	2012
Treatment Group 2	CLLD	Schools in same 18 LAs + 32 new LAs	2006/07	2002	2007	2009	2013
Control group		Schools in next 50 LAs	2008/09 and 2009/10	2004	2009	2011	2015
		Schools in next 50 LAs	2009/10	2005	2010	2012	2016

Source: Machin et al. (2016, Figure 2.6, p. 26; cf. Machin et al., 2018, Table 1, p.224)

It would also be consistent with the key theoretical distinction that Paris (2005, p.187) drew between “constrained” and “unconstrained” reading skills. Concepts of print, letter knowledge, phonics, phonemic awareness and fluency are “constrained” because they have finite skill sets, “develop from non-existent to high or ceiling levels in childhood”, and are generally mastered within a limited span of time, whereas vocabulary and comprehension are “unconstrained” – they are open-ended and continue to develop throughout life.

Thus there is evidence that phonics is effective across the primary age-range and that its effects are durable in the crucial early years, for normally-developing and most at-risk children. This also appears to apply to ELL/EAL/ESL children, although this area would benefit from a wider set of rigorous studies.

Do any Non-Phonics-Based Approaches Work as Well as, or Better Than, Phonics for Struggling Readers?

Can any of this be matched by non-phonics-based approaches in comparative studies? There appear to be no relevant studies across ages, for ELL/EAL/ESL children, or with longitudinal

data. So the only subcategory that can be considered here is the generic one that the literature refers to as “struggling” readers.

Of the systematic reviews in Table 2 concerned with struggling readers, Sherman (2007) and McArthur et al. (2012, 2018) did not cover any non-phonics-based approaches. Galuschka et al. (2014) spread their net wide, but found so few RCTs on other approaches that they could not subject them to statistical analysis. Stevens et al.’s (2021) results apply to only one approach. However, Suggate (2010), using both RCTs and quasi-experimental studies, did find strong effects of comprehension-based approaches, as shown above, especially after the “cross-over” with phonics in grade 2.

In a best-evidence synthesis study, Slavin et al. (2011, p.19) concluded:

[A]lmost all successful programs have a strong emphasis on phonics... [O]ne-to-one tutoring programs ... had a much more positive weighted mean effect size if they had a strong phonetic emphasis (mean ES = +0.62 in 10 studies). One-to-one tutoring programs with less of an emphasis on phonics, specifically *Reading Recovery* and *TEACH*, had a weighted mean effect size of +0.23.

This conclusion was based mainly on studies which did not compare phonics-based and non-phonics-based interventions directly with each other, but each type of intervention with its own appropriate but separate control groups. Davis (2018) (on whose work the rest of this section draws heavily), in preparation for her own pilot RCT on a non-phonics-based intervention, searched long and hard for non-phonics schemes for Year 1 and 2 (kindergarten and 1st grade) children which had been directly compared with phonics, and found only *Reading Recovery* (RR). As Slavin et al. (2011, p.6) pointed out: “*Reading Recovery* is by far the most widely researched and widely used tutoring program in the world”, and the US Institute of Education Sciences’ What Works Clearinghouse <<https://ies.ed.gov/ncee/wwc/Intervention/209>> gives positive ratings to the research on it as an early intervention.

RR is a school-based intervention developed by Marie Clay in New Zealand in the 1970s, and designed for English-speaking children aged five or six who are the lowest achievers in literacy after their first year of school (see especially Clay, 1977, 1985). Its intention has always been that, after 20 or more weeks’ one-to-one instruction an hour a day, these children should have improved enough to be “discontinued” (judged by their RR teacher to have achieved a reasonable level of independence in reading and be reading at average levels or above for their class, and so able to leave the programme), and therefore return to their classroom full-time (or, absent sufficient improvement, be referred for even more specialized attention). The curriculum programme design was originally based on close observational studies by Clay of initial reading and writing. While the initial model emphasized relations between spoken language and (transcribed) writing, later iterations added some explicit attention to phonics.

The later reforms of RR were in part a response to the Rhode Island study (Iversen and Tunmer, 1993), which compared standard RR with RR modified to include phonics (“explicit training in phonological recoding skills”, Iversen and Tunmer, 1993, p.115). The modified RR group took on average significantly less time, 41.75 lessons, than those in the standard RR group, 57.31 lessons, to be ready for successful discontinuation of the intervention. However, at the end of the school year, on the RR Diagnostic Survey (Clay, 1985) the modified RR group outperformed the standard RR group on just one out of six measures; and on the only independent measure used, the Dolch Word Recognition Test (Dolch, 1939), there was no significant difference (Iversen & Tunmer, 1993, Table 5, p.121). The effect size for the end-of-year Dolch Test data (not reported in the paper, but calculated by the present author as [(modified RR post-test mean) minus (standard RR post-test mean)] / pooled post-test standard deviation) is 0.25, modest at best. Given that there was no “phonics without RR” group in the study, it remains unclear whether RR or phonics per se would come out better in a direct comparison. Note that my summary conclusions about the Rhode Island study are much weaker than most of those in the literature, which seem to have given too

much weight to measures internal to RR and/or to experimenter-devised tests, thus producing an over-strong interpretation of a quite small experiment (N=32 in each group).

Stronger evidence for RR's effectiveness compared to phonics appeared to arise from Pinnell et al. (1994). They investigated not only RR but the effect of three other interventions, Reading Success, Reading and Writing Group, and Direct Instruction Skills Plan, and compared all four interventions to a control group in a randomized design. Reading Success and Reading and Writing Group were based on RR, and, like RR, placed little emphasis on phonics, whereas Direct Instruction Skills Plan gave phonics much more attention; the control group received less phonics teaching than the Direct Instruction Skills Plan group, but more than the other three. Key data from this study, namely sample sizes pre and post, amount of phonics teaching observed, and mean effect sizes for the two reading tests used, are shown in Table 9.

Table 9: Sample Sizes, Amount of Phonics Teaching, and Mean Effect Sizes at Immediate Post-test for the Interventions Investigated by Pinnell et al. (1994)

		Reading Recovery	Reading Success	Reading and Writing Group	Direct Instruction Skills Plan	Control group
	N (pre-test)	31	41	27	36	190
	N (post-test)	31	40	24	29	165
	% phonics teaching	15.0	7.7	5.6	36.9	22.5
Effect sizes	Gates-MacGinitie	0.51 *	0.27	0.23	0.14	n/a
	Woodcock-R	0.49 *	0.04	0.23	0.25	

* p<0.05; other effect sizes ns.

Sources: Group Ns - Pinnell et al. (1994, Table 7, p.27)

% phonics teaching - Pinnell et al. (1994, Table 6, p.26)

Effect sizes at immediate (February 1990) post-test - Pinnell et al. (1994, Table 18, p.33).

According to these results, RR was the only intervention that provided statistically significant results on both tests. It outperformed not only its two derivatives, which contained even less phonics, but also Direct Instruction Skills Plan and the control group, both of which contained more phonics. However, this study was criticized by Rasinski (1995) on the grounds that instructional time varied across the different treatment conditions. When instructional time was factored into the analyses, the alternative interventions, and even the control group, had outcomes close to, or better than, RR.

Overlooked in most analyses of data on RR is the original study of the Reading Intervention approach in the English county of Cumbria (Hatcher et al., 1994). This was a quasi-experiment with four matched groups. One of the intervention groups (Reading) received a programme that was essentially identical to RR as then taught (i.e., without phonics), another received only phonics (Phonology), and the third (Reading and Phonology) received both - a control group received neither. The Reading and Phonology group made greater progress in reading accuracy, reading comprehension and spelling than all others, which did not differ. This study in effect provides the "phonics without RR" group that was missing from the Rhode Island study, and calls in question any claim that standard RR may be more effective than phonics for struggling readers. It also provides no counter-evidence to the tentative conclusion already reached, namely that *the combination of systematic phonics teaching and comprehension-based approaches is probably more effective than either alone.*

How is Phonics Teaching to be Integrated with the Rest of the Literacy Curriculum?

One way of using both systematic phonics and comprehension-based approaches would be to teach phonics and comprehension in discrete sessions, but there is evidence to suggest that a more integrated approach may be more effective. In the Cumbria study, based on what they called the "phonological linkage hypothesis", Hatcher et al. (1994, pp.47-48) included the following activities only for the children in the Reading with Phonology group:

[P]ractic[ing] letter-sound associations, relating letters to sounds using plastic letters ... and writing words while paying attention to letter-sound relationships... The phonological linking exercises were linked to points arising from the children's writing (writing a story) and their reading during the first part of each session.

The authors attributed this group's greater progress to the linking activities. The scheme and developments of it have been used beneficially in experiments with both struggling and normally-developing readers, and in whole-class settings as well as small-group and individual instruction (for a summary see Lavan and Talcott, 2020, sections 2.28 and 8.6).

McGee et al. (2015, Analysis 2) made a fine-grained study over a school year of the oral reading errors and self-corrections of 39 young American children who had been referred to Reading Recovery because of reading difficulties. At the end of the year they distinguished two groups: those who were reading at first-grade level (N=29), and those who were reading below first-grade level (N=10). The two groups had not differed at the outset. Analysis showed that those who had progressed to first-grade reading level had learnt to use more effective self-correction strategies. In particular, they could use phonics or contextual information, and often integrated them – a finding compatible with Hatcher et al.'s (1994) phonological linkage hypothesis which claimed that integrating code and meaning emphases would enable greater progress than using either alone or even than teaching both *separately*.

Both the Hatcher et al. and McGee et al. studies found benefits for struggling readers, so Shapiro and Solity (2008, pp.597-598)

investigate[d] whether a phonological intervention delivered on an entirely whole-class basis, over an extended time scale, can both reduce the incidence of literacy difficulties and also raise the attainments of normally developing readers... Teachers delivered the training within a broad reading programme to whole classes of children (N=351) from Reception to the end of Year 1 [prekindergarten and kindergarten]. A comparison group of children (N=213) received standard teaching methods... The strategy significantly impacted on reading performance for normally developing readers and those with poor phonological awareness, vastly reducing the incidence of reading difficulties from 20% in comparison schools to 5% in intervention schools.

A principal element of the strategy was that teachers taught a whole class a new phonics item, then immediately drew attention to it while reading a book to the class.

Building on the phonological linkage hypothesis and on Shapiro and Solity (2008), Chen and Savage (2014) added the requirement that children articulate the relevant grapheme-phoneme correspondences, found positive results with Grade 2 children, and christened the process "Direct Mapping". Savage et al. (2018) explored Direct Mapping, allied with training in the "set for variability" which children need to cope with the far-from-consistent English orthography, in a complex RCT with "at-risk" kindergarten or Grade 1 children in two Canadian provinces. The intervention group (N=119) and control group (N=82) both received systematic, intensive phonics instruction, but only the intervention group additionally received Direct Mapping and "set for variability" training. The results showed a significant benefit to the intervention group for word reading and spelling at immediate post-test, and for word reading and sentence comprehension at delayed post-test.

Taken together, the results cited in this section suggest that the Direct Mapping integration of phonics with reading comprehension has potential for both struggling and normally-developing young readers which merits further investigation. A cluster RCT of Direct Mapping, under the name "Flexible Phonics"

<<https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/flexible-phonics>> with reception-year (pre-kindergarten) children in over 100 schools in the Greater London area was planned for 2021/22.

Which Type of Phonics?

As with phonics in general, it is necessary to provide definitions here to avoid confusion arising from conflicting usages in the literature. Most recent debate has focused on synthetic and analytic phonics, which Strickland (1998, p.31) defined as follows:

Synthetic phonics refers to an approach in which the sounds identified with letters are learned in isolation and blended together. Children are taught to segment a single syllable word such as *cat* into three parts /k, æ, t/, and to blend the parts together to form a word ...

Analytic phonics refers to an approach in which the sounds associated with letters are not pronounced in isolation. Children identify the phonic element from a set of words in which each word contains the particular element under study. For example, teacher and students discuss how the following words are alike: *pat, park, push, and pen*.

It is important to note that the terms “synthetic” and “analytic” as applied to phonics have specific meanings quite different from, and in part at odds with, their usual and more general meanings. Both approaches are systematic.

Similar definitions were used by the US NRP (Ehri, Nunes, Stahl, and Willows, 2001, p.395). Noting that they covered only phonics for reading, Brooks (2003, pp.11-12) expanded them to cover spelling/writing as well, and his definitions were adopted by Torgerson et al. (2006, p.13). While some authorities consider sounding-out and blending as the only essential criteria for classifying a phonics approach as synthetic, others add further criteria (cf. Torgerson et al., 2006, Appendix A, p.54), in particular insisting that in reading these processes should be used only to decode *unfamiliar* printed words. This is the normal practice, but sometimes teachers have children go back to a word they’ve just identified (perhaps by other means) and then rehearse the synthetic phonics technique, in order to help the children to remember to use it – a form of Direct Mapping. Analytic phonics as traditionally used in Scotland avoided sounding-out and blending to start with, but introduced it once children could identify letter-sounds in all positions in the word (thus moving into a synthetic phonics phase).

Torgerson et al. (2006, p.6) also provided a definition of onset-and-rime phonics:

A form of phonics teaching in which sounding-out is not applied (at least not in the early stages) to every letter but just to the initial consonant, and then the remainder of the word as a unit, for example /k, æt/, /kæt/.

The technique called “analogy phonics” is defined in the same way. One source of confusion in the literature is that some authors (e.g., Buckingham, 2020) describe onset-and-rime as analytic phonics – but since it involves sounding-out from the start it is better classified as a “large unit” version of synthetic phonics. There is to date too little research evidence comparing onset-and-rime with other phonics approaches to support any firm conclusion about it, but Macmillan’s (2002) conceptual analysis suggested caution in using onset-and-rime pedagogy. Also, Brooks (2015, pp.466-469) demonstrates that only a very few rimes have pronunciations which are not predictable from the correspondences of their constituent graphemes. Segmental (grapheme and phoneme) phonics therefore seems more efficient, in least in theory, since experimental evidence is lacking.

The debate over synthetic versus analytic phonics is thus far inconclusive. Ehri, Nunes, Stahl, and Willows (2001, Table 1, p.405) reported an effect size of 0.45 (N of cases = 39) for synthetic phonics against all other types lumped together, but could not address whether synthetic phonics was more effective than analytic because they located just one study in which the two were directly compared (Torgesen et al., 1999); those authors found no significant difference between the two varieties. Torgerson et al. (2019, p.222) concluded that all the phonics interventions which Suggate (2010) analyzed were essentially synthetic

phonics, all Urbanová's (2016) evidence came from synthetic phonics, and all the phonics rolled out across England in 2005-10 (Machin et al., 2016, 2018) was synthetic. But in the absence of comparison groups experiencing a different form of phonics, this only proves that synthetic phonics is more effective than unsystematic or no phonics, not whether it is more effective than some other variety.

Torgerson et al. (2006) also addressed the synthetic versus analytic question, but found only three relevant RCTs (yielding a non-significant overall effect size of 0.24), and stated this was too small a basis on which to make a firm judgment. One of the three RCTs, conducted in Scotland (Johnston and Watson, 2004, experiment 2), had found a significant advantage of synthetic over analytic phonics (effect size 0.97), and Johnston et al. (2009) took issue with Torgerson et al.'s conclusion. They argued (1) that one of the three RCTs (Skailand, 1971), which had produced a result in favour of a variety of analytic phonics, should not have been included in Torgerson et al.'s analysis because it was an unpublished doctoral thesis, and had used an "invalid" version of initial synthetic phonics in which some stimulus words contained split digraphs; and (2) that using only their own Scottish RCT and Torgesen et al. (1999) produces a definite result in favour of synthetic phonics.

Johnston, McGeown, and Watson (2012) attempted to bolster the case for synthetic phonics with a comparative study. For the synthetic side they used data from the children who had received synthetic phonics from the start of the much-cited 7-year study in the small rural county of Clackmannanshire, Scotland (Johnston and Watson, 2004, experiment 1); specifically, follow-up data collected in (apparently) 2002, when the children were 10 years old (Johnston and Watson, 2005). For the analytic side, Johnston et al. (2012) gathered new data on 10-year-olds "in a city in England" (p.1369), several years later (the exact date is impossible to determine). When this group were in their first three years in school, they had been taught using a government-issued scheme called *Progression in Phonics* (DfEE, 1999), which began as analytic, without sounding-out and blending, but then, as in traditional analytic phonics, moved into a synthetic phase. Johnston et al. (2012, p.1365) claimed that "the group taught by synthetic phonics [from the start, i.e., the Scottish group] had better word reading, spelling, and reading comprehension."

However, there are reasons to doubt the validity of the comparison. Although the authors gathered background information purporting to show that SES levels were similar in the two samples, they made no attempt to estimate any rural versus urban effects; and above all they ignored "period" effects: "Period effects are similar to cohort effects but the term is often reserved for effects that could have impacted everyone at the time of assessment" (Desjardins and Warnke, 2012, p.16); in other words (putting it rather grandiosely) the impact of living at different times in history. The possibility of period effects places a limitation on what it is reasonable to claim from data which are highly dependent on the different times and contexts in which they were obtained.

In summary, the synthetic versus analytic debate is still, in my judgment, empirically unresolved and open. Skailand (1971) was validly included in Torgerson et al.'s (2006) meta-analysis as a contribution to avoiding possible publication bias (not even Bowers, 2020 has objected to Torgerson et al.'s, 2019 use of two meta-analyses which are unpublished PhD dissertations: Han, 2009; Sherman, 2007); with or without the Skailand RCT, the evidence is still too small a basis for reaching a judgment on whether synthetic or analytic is more effective; Johnston et al.'s (2012) attempt to boost the case for synthetic over analytic phonics using data gathered in different circumstances at separate dates is problematic. Torgerson et al. (2006, p.50) "recommend[ed] a large UK-based cluster-randomized controlled trial to confirm the findings of this review, and to investigate further the relative effectiveness of systematic synthetic versus systematic analytic phonics instruction with children with different learning characteristics." That recommendation was ignored, as was a proposal in 2008 by the same team for such an RCT with adult learners.

Phonics in UK and US Government Policies

Nevertheless, the synthetic versus analytic debate has had far-reaching consequences for the teaching of initial literacy in England. Johnston and Watson (2004) claimed that their longitudinal study (their experiment 1) supported synthetic over analytic phonics. Despite the study's methodological flaws (in particular, the five intact classes allocated to the synthetic phonics condition were selected on the basis of the experimenters' judgment, so that this was a non-randomized unmatched groups study), its pro-synthetic results attracted so much attention that in 2005 the British government commissioned: (1) a review of the teaching of early reading (Rose, 2006); (2) the systematic review of phonics by Torgerson et al. (2006); (3) a synthetic phonics teaching framework, *Letters and Sounds* (DfES, 2007) – see the sections headed “Do Other Varieties of Phonics Have a Role to Play?” and “Where to Start?”; and (4) the synthetic phonics programmes later analyzed by Machin et al. (2016, 2018).

Although Torgerson et al. (2006) concluded that there was insufficient evidence to decide between varieties of phonics, and reported this to the Rose Committee, Rose (2006, p.3) plumped for synthetic: “The practice seen by the review [team] shows that the systematic approach, which is generally understood as ‘synthetic’ phonics, offers the vast majority of young children the best and most direct route to becoming skilled readers and writers.” Over the next few years (for details see Beard, Brooks, and Ampaw-Farr, 2019, and Torgerson et al., 2019), policy on the initial teaching of literacy in England moved from systematic with a preference for synthetic, to systematic synthetic phonics (SSP) becoming statutory in the national curriculum for English in state-funded primary schools in England ((UK) Department for Education, 2013). That requirement applies only to England, and not to any of the other three nations of the United Kingdom. Nor does it apply to private schools in England, though some choose to follow it.

From 2012 to 2019 the mandatory status of SSP was enforced with a test of synthetic phonics applied to all Year 1 (5- and 6-year-old) children. In most years the percentage of children passing the test increased, and British government ministers claimed this as a success. In 2017 the first cohort of children to have taken the phonics test (in 2012) took the end-of-primary-phase reading test; the results showed an improvement over previous years. British government ministers claimed this too as a success, *despite the impossibility of demonstrating any causal link in the absence of an untreated control group*. Moreover, the independent evaluation of the phonics test commissioned by the government (Walker et al., 2015) found that it had no clear impact on literacy attainment. Because of the Covid-19 pandemic the 2020 iteration of the Year 1 phonics test was postponed to the relevant children's first term in Year 2, and then to June 2022 (when the relevant children would be in Year 3); the 2021 iteration was first cancelled, then instead postponed to the Autumn term 2021. In July 2021 the British government issued a non-statutory guidance document for schools

<<https://www.gov.uk/government/publications/the-reading-framework-teaching-the-foundations-of-literacy>>, which further reinforced its insistence on SSP.

Official requirements on providers of initial teacher education (ITE) in England specify SSP, and updated requirements issued in 2020 (Office for Standards in Education, Children's Services and Skills, 2020, p.38) state: “In primary phase programmes, training ensures that trainees learn to teach early reading using [SSP] ... and that trainees are not taught to use competing approaches to early reading.” Later (p.44) the document implies that ITE providers will be judged inadequate if their training “does not ensure that trainees only learn to teach decoding using [SSP] as part of early reading”. This appears to be the first attempt by a government body to *forbid* the use of alternatives to SSP, and thus goes beyond conventional curriculum prescription and implementation per se.

Phonics instruction has also formed part of initiatives in the United States. *Reading First* was based on the NRP findings, and included systematic phonics instruction as one of the “big five” elements deemed essential to effective teaching of literacy (along with phonemic awareness, fluency, vocabulary, and comprehension). For several years up to 2008 the

annual funding of *Reading First* was US\$1 billion. Although it increased the average amount of classroom time given to the five elements, it produced no statistically significant improvement in participating students' comprehension scores compared to the control groups (Gamse et al., 2008). Inhibiting factors seem to have included a failure to adapt teaching methods sufficiently, and perhaps the lack of related professional development that that may imply.

Reading First appears to have been replaced by the *Common Core State Standards* (National Governors Association Center for Best Practices, Council of Chief State School Officers 2010). According to the Common Core website <<http://www.corestandards.org/standards-in-your-state/>> all but nine of the 50 States have adopted the Standards. However, the specifications seem deliberately to sidestep the question of which variety of phonics to use: the words "systematic", "synthetic" and "analytic" never appear as descriptors of phonics. Also, unlike in England and *Reading First*, there is no national assessment of young children's phonic knowledge that could estimate whether or not the Standards are improving children's attainment.

To What Extent Is the Statutory Mandating of Phonics "Evidence-Based"?

This central curriculum policy question raises two challenges. First, if it is re-phrased as "Is the adoption of systematic phonics instruction within the initial teaching of literacy justified?", the accumulated evidence summarized above clearly responds in the affirmative. Secondly, if it is taken to mean "Does the accumulated evidence justify the mandating of a particular variety of phonics?", the answer is No or, better, Not yet. The absence of the words "synthetic" and "analytic" from the *Common Core State Standards* may signal that the compilers were alert to the lack of convincing evidence that any one variety of phonics is more effective than another.

Beyond this point there is also the question of whether governments should be in the business of specifying or (perhaps worse) banning particular pedagogical practices at all – but these clearly are normative matters of educational politics and policy, of the relations between the state and schooling, as much as they might be matters about the scientific justification and rationale for the teaching of phonics per se.

Do Other Varieties of Phonics Have a Role to Play?

The Literacy Dictionary (Harris and Hodges, 1995, p.186) listed 11 types of phonics; only synthetic and analytic seem to remain in use. Ehri, Nunes, Stahl, and Willows (2001, pp.395-396) defined five: synthetic, analytic, phonics through spelling, phonics in context, analogy phonics. Internet searches conducted in August 2020 revealed that (1) "analogy phonics" or "phonics by analogies" consists almost entirely of onset-and-rime approaches - there appear to be no randomized control trials, matched-groups quasi-experiments or other rigorous studies on these methods; and (2) that "phonics in context" is essentially equivalent to embedded or incidental, that is unsystematic, phonics.

For phonics through spelling, now known as linguistic phonics, some preliminary evidence is available. Where both synthetic and analytic phonics in effect take graphemes (and therefore reading) as primary, and work from them to phonemes, linguistic phonics reverses the priority in favour of spelling/writing, and works first from phonemes to graphemes. It is therefore essentially equivalent to Brooks's (2003, p.11) definition of synthetic phonics for writing:

Children are taught to say the word they wish to write, segment it into its phonemes, and say them in turn, for example /d, ɒ, g/, and write a grapheme for each phoneme in turn to produce the written word, *dog*.

(N.B. This example relates to the General British (GB) accent (formerly known as RP, "Received Pronunciation"), and includes the short vowel phoneme /ɒ/ which does not occur in the General American accent.) Linguistic phonics works from the known – children's existing

spoken vocabulary – to the unknown – the arbitrary marks on paper, enabling the child to imbue those marks with sense. A further implication is that spelling/writing must be taught simultaneously with reading from the outset.

This approach can be traced back to Pestalozzi (1801) in Switzerland, and was transplanted to Pennsylvania by his colleague Neef (1813), but then fell into obscurity (Brooks, 2021a). However, in *A Dictionary of Reading and Related Terms* (Harris and Hodges, 1981, p.181), part of the entry for “**linguistic approach or method**” reads “A beginning reading approach based upon regular sound-symbol patterns, first proposed by Neef (1813) and more recently by L. Bloomfield in the 1930’s’, and Chall (1967, p.307 and elsewhere) refers to “a linguistic approach”.

A contemporary example is the *Letters and Sounds* (L&S) scheme (DfES, 2007) which was commissioned by the British government after the Rose review (2006) for use in primary schools in England. Its linguistic phonics basis is not overt, but its authors grounded initial teaching on accuracy about the 44 phonemes of the GB accent and the most frequent and/or representative grapheme for each of them, introduced in a systematic sequence (see Brooks, 2021b). Several new schemes devised in Britain subsequently were explicitly based on L&S. However, there is no research evidence on its effectiveness.

The (very limited) research evidence on “phonics through spelling”-type interventions in English and Dutch is summarized in van Rijthoven et al. (2020). They also tested it with 54 Dutch children diagnosed with developmental dyslexia, and found positive effects on word and pseudoword reading efficiency and word spelling relative to normal population norms. With a small (N=24) group of adult ESL learners at a women’s centre in Brixton, south London, Brooks and Burton (2010) conducted an evaluation of the Spalding Method (Spalding and North, 2003), in which writing is tackled first and leads on to spelling and then reading; they found mainly positive results. Given the lack of conclusive evidence to date, all that can be said is that linguistic phonics may have potential as an alternative to other systematic phonics approaches.

Where to Start?

Children can’t cope with the whole alphabet or the full inventory of phonemes at once, so phonics schemes necessarily adopt some sequence for the introduction of graphemes and phonemes. Traditional analytic phonics, as practised in Scotland, is said to have worked through the alphabet one letter per week over most of a school year. As a linguistic phonics scheme, *Letters and Sounds* begins with *satpin*, that is, those letters and their most frequent correspondences with phonemes, namely /s æ t p i n/. An American exponent of Orton-Gillingham methods, Cox (1967), was the first to work out that about 50 English monosyllables can be constructed from those six letters and their correspondences, most of them regular (but not *pint*), and many initial reading and spelling schemes and frameworks since have been based on that insight. Cox’s own initial sequence was <i t p n s a>. As Cox (1992, p.109) put it:

The order of introduction of the letters allows for wide separation of the most frequently confused symbols – and <d>, etc., - and speech sounds – /ɪ, e/, etc. It has the added advantage of providing phonetic [*sic*] words for reading at the fastest possible rate.

Hickey appears to have been the first to import this insight into Britain; she incorporated it in her *Hickey Language Course* (Hickey, 1977). The second edition of that course (Augur and Briggs, 1992, p.124) contains this statement: “The introduction and the teaching points for the first seven letters in the programme ‘i t p n s a’ and ‘d’ are explained in detail.” Already here Pestalozzi’s and Cox’s emphasis on phonemes and writing is secondary to the service of letters and reading.

The idiosyncrasies of English orthography (comprehensively analyzed for the GB accent and British spelling in Brooks, 2015) impose limits on all phonics approaches: some high-

frequency irregular words, especially *the*, must be taught and learnt as sight words very early. Non-phonics-based approaches seem to expect children to take this in their stride; many teachers (at least used to) induct children with a brief whole-word-only reading phase before starting phonics, as in “look-say” approaches. At the other extreme, advocates of phonics “first, fast and only” (e.g., the Reading Reform Foundation) insist on an initial phase in which children exercise their phonic skills only on letters, then on single words, before attempting to apply them to words in text (including books). Integrated approaches incorporate both story time and early phonics on the grounds that both are needed. However, either/or thinking sometimes precludes such integration. I must admit that, to the best of my knowledge, there has not been any comprehensive or definitive research on the relative effectiveness of whole-word-only versus one-phoneme-and-grapheme-at-a-time initial teaching, so this debate carries on without evidence. Yet if the evidence presented earlier showing that mixed approaches are more effective than either phonics or comprehension-based approaches alone is accepted, this would imply that both code and meaning emphases are needed from the start.

Phonics for Adult Learners?

Many adult literacy practitioners avoid phonics for fear that it will seem childish or insulting to their students:

[I was teaching] a group of 16- to 19-year-old ... construction learners, who were often disengaged, [and] had negative previous educational experiences and worryingly low reading and writing levels. To begin with I felt quite concerned and out of my depth; how was I going to get young adults to engage in a topic they associated with primary school? I doubted my own ability and questioned whether I could ever teach using phonics.
(Chapman, 2020, p.22)

This is despite there being some evidence in the literature to show that it can be helpful and popular. For example, Burton (2007, p.27) reports an adult literacy learner in England saying:

I didn't know that when the same two letters come together in a word (e.g., double consonant in *dinner*) there's only one sound. If I'd have known that it would have helped me a lot.

Extensive observation of adult literacy classes in England (Brooks et al., 2007) found that phonics was rarely used, and in some cases inaccurately. Burton et al. (2010) carried out a pilot project evaluating phonics teaching with 42 adult learners, and found a significant improvement in both reading and spelling; this appears to be the only such project ever carried out in Britain. A review of phonics for adults (Moss et al., 2018) found very few relevant studies, of which only Condelli et al. (2010), using adult American ESL learners, met research quality standards; none (including that study) found statistically significant results for phonics instruction. Moss et al. (2019) developed a “phonics toolkit” for teaching adults and older teenagers in England based on linguistic phonics principles as outlined above. Millar (2020) and Chapman (2020) provide ethnographic accounts of successful use of the toolkit – the latter for both literacy and maths – but the whole area of phonics in adult literacy requires more rigorous, quantitative investigation.

Government-backed curricula for adult literacy and adult ESL provision in England were published in 2001 *Adult Literacy Core Curriculum* <<https://repository.excellencegateway.org.uk/Adult%20literacy%20core%20curriculum.pdf>> and 2002 *Adult ESOL Core Curriculum* <<https://esol.excellencegateway.org.uk/content/etf1194>> respectively. They cover what in the UK are called Entry level and Levels 1 and 2 (equivalent to Levels 1-3 in international surveys of adult basic skills); both feature a strong emphasis on phonics in the Entry level sections on reading, less so on spelling/writing or at Levels 1 and 2. The relevant sections in the ESL curriculum draw heavily on the corresponding literacy

sections, with copious extra exemplification, but seemingly no awareness that phonics might be less appropriate for second-language learners.

There appear to be no such published curricula in the United States – implicit curricula are presumably supplied by the intuitions of adult literacy and ESL teachers and by the teaching methods and materials they use.

What Should Teachers Know in Order to Teach Phonics Most Effectively?

If phonics teaching, especially of synthetic phonics, is to be maximally effective, it should be accurate. Yet lack of foundational knowledge, and hence ungrounded practice, appear to be widespread. For example, the mantra “When two vowels go walking, the first does the talking” still appears to be recited, even though it was shown long ago by Clymer (1963/1996; cf. Brooks, 2015, pp.448-450) to be so full of exceptions as to be useless. Morris (1984) in Britain argued that knowledge of the phonemes of English and of their representations in the orthography was essential, but had found that trainee teachers lacked it. More broadly, Moats (1994) in the United States argued that, although teachers should be able to teach explicitly many aspects of language that are integral to reading and writing (phoneme awareness, phonics, morphology, syntax, etymology, etc.), they themselves had a poor grasp of the concepts. Twenty years on, she was still lamenting:

Although reading disability may be caused by a complex mix of genetic and environmental factors, intervention studies are consistent in supporting the efficacy of explicit, systematic, language-focused instruction, regardless of the presumed origin of the disability. Current research emphasizes the mixed nature of most language-based reading disabilities, the changing nature of reading disability over time, and the fallacy of single-solution approaches such as isolated training in phoneme awareness, singular focus on phonics, or fluency practice that excludes other essential components of instruction.
(Moats, 2014, p.77)

While focused here on children with reading disabilities, her arguments seem valid for all literacy instruction.

The situation is no better in Britain. Beard et al. (2019) and, in much greater detail, Brooks et al. (2021) have shown how grossly inaccurate are some commercially published phonics schemes available in the United Kingdom. Resources are available for improving this situation: Brooks et al. (2021) also provide criteria for judging the phonetic and phonic accuracy of phonics materials; Burton (2011) provides a handy primer on *Phonetics for Phonics*; Brooks (2021b) lays out the essentials of “The linguistic base of initial reading and spelling in English”, including the most essential phoneme-grapheme and grapheme-phoneme correspondences; the national curriculum for English in state-funded primary schools in England (DfES, 2013, pp.49-73) sets out the phonetics, including the International Phonetic Alphabet symbols, etc., which teachers of literacy are expected to know; and the Education Endowment Foundation <<https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/phonics/>> in Britain provides a phonics toolkit for use in the early years. But since no empirical research on this area appears to be occurring, it remains to be seen whether all this guidance will make a difference to teachers’ professional knowledge and then to practice.

By comparison, the (US) *Common Core State Standards* <http://www.corestandards.org/wp-content/uploads/ELA_Standards1.pdf>, p.16 distinctly under-specify the knowledge that teachers need: although the words “phoneme” and “grapheme” appear, no guidance or references are given on what the phonemes and graphemes of American English are. At CCSS.ELA-LITERACY.RF.K.3.B <<http://www.corestandards.org/wp-content/uploads/ELA-Literacy/RF/K/3/b>>, the Standard reads: “Associate the long and short sounds with common spellings (graphemes) for the five major vowels.” This statement perpetuates phonetic and phonic errors: (a) despite the intuitions and apparently constant tradition of many teachers in the United States, there is no phonetically short vowel phoneme corresponding to letter

<o> in the General American accent; (b) of the so-called “long vowels” associated with the letters <a, e, i, o, u> (actually their names), only /i:/ (the name of <e>) is a phonetically long vowel phoneme, /eɪ, aɪ, əʊ/ (<a, i, o>) are diphthongs, and /ju:/ (<u>) is a sequence of two phonemes; and (c) “major vowels” is neither a phonetic nor an orthographic category.

Another feature which Brooks et al. (2021) criticize is the tendency of some phonics materials authors to assume that children can work out for themselves things they have not yet been taught. While self-teaching soon becomes essential, in the initial stages many children need things laid out explicitly, and the reading materials they practise on should reinforce this; this clearly implies a degree of vocabulary control, as in “decodable texts”. However, caution is needed here:

[I]n our view, once children move beyond the very early stages of reading, the benefits of decodable readers are likely to be outweighed by their limitations. More research is needed to determine when this tipping point occurs.
(Castles et al., 2018, p.16)

Also to determine how much decodability. Price-Mohr and Price (2020) investigated the effect of low or high phonically-decodable texts on young children learning to read. They found a statistically significant difference on reading comprehension in favour of the low phonically-decodable texts, challenging the idea that children find highly decodable text easier to read. But, given that this was small study (N = 36 overall), the jury is still out on this.

Where Next? Integrated Teaching of Literacy?

This review suggests that there is a rich and complex evidence base to guide the use of phonics in the teaching of literacy. Key findings here are that:

- Systematic phonics teaching is effective for teaching children to read and spell in English;
- *The combination of systematic phonics teaching and comprehension-based instruction is probably more effective than either alone*, as indeed the Simple View suggests;
- There is not yet enough convincing research evidence to decide between synthetic and analytic phonics;
- Phonics teaching for children whose first language is not English, and for adults, and how best to integrate code and meaning emphases are the areas with the most urgent need of rigorous research;
- Government policy and mandated curriculum interventions are often heavy-handed, and have a mixed track record of effectiveness;
- Currently, the underpinning professional knowledge needed to ensure effective integrated initial teaching of literacy needs strengthening.

Thus there are no longer any grounds on which to resist the use of systematic phonics instruction in initial literacy teaching, provided it is integrated with meaning-based approaches, or, conversely, to insist on a phonics-only initial phase. However, teacher preparation, knowledge and practice need to be aligned accurately and in detail with the demands of such an integrated curriculum – much of the phonetic and linguistic underpinning for this is already available and awaiting research-based implementation, both in classrooms and in initial teacher education programmes.

For this to happen, in addition to the areas for further research already identified, “given the uncertainties in the evidence base over publication bias [and] the ‘phonics’ status of some included studies, there may be a case for conducting a large and even more rigorous systematic review” (Torgerson et al., 2019, p.234) of existing experimental research. This would take in, multiply code, and rigorously quality-appraise all available relevant studies, including those focused on ELL/ESL children. The aims would be to establish carefully which studies meet strict inclusion criteria, estimate both unmoderated main effects and the influence of moderator variables, and establish which variety of phonics, if any, is more

effective than others. If governments are serious about wanting the teaching of literacy, and children's attainment, to improve, they will need both to fund this research and abide by the findings.

Acknowledgments

I wish to thank David Pearson and Tim Shanahan for help with points of detail, two anonymous reviewers for their helpful comments, and especially Allan Luke for highly detailed and beneficial editing and guidance through three drafts.

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