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What is This?
The logographic nature of English alphabetics and the fallacy of direct intensive phonics instruction

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Abstract US government mandates to implement intensive phonics instruction in elementary classrooms invoke an alleged scientific superiority of this approach over more meaning-centered models. But curiously absent from this scientific enterprise is a study of the phonics system itself. Advocates of intensive phonics have not demonstrated that the commonly taught patterns are capable of imparting the desired amount of decoding abilities to developing readers. In fact, the English phonics system operates at a level of complexity that essentially defies teachability. The explanation for this level of complexity is the logographic nature of English alphabetics. Recent neuroimaging research does not independently support intensive phonics, despite claims to the contrary, because the capacity of magnetic resonance imaging (MRI) machines to identify brain regions used for decoding says nothing about the role of decoding in reading. Neuroimaging does not distinguish the phonological processing of a decoding model of reading from the graphophonic processing of a meaning-centered model. A recent multiclassroom study comparing distinct reading instruction practices found that letter-sound patterns were actually learned better by children in whole language classrooms than children in intensive phonics classrooms. We conclude that neither linguistic, neuroscientific, nor classroom research has demonstrated the superiority of intensive phonics over meaning-centered approaches to reading.

Keywords alphabetic writing; logographic writing; neuroimaging; phonics; whole language
The problem of phonics

It is a very curious phenomenon that the most ardent advocates of intensive phonics instruction in the classroom have never undertaken a linguistically sophisticated investigation of English letter-sound relationships. Their unspoken (and unwritten) premise is that traditional patterns are somehow accurate enough to convey the essence of the system to young learners.

This is a serious problem for the phonics intensivists. The necessary scientific questions that have simply not been addressed are these: (1) Without a description of the actual system of letter-sound relationships operating in English, how do we know that what is actually being taught in the classroom is not so simplistic that it is unable to impart the desired amount of ‘decoding’ skills? (2) Without a description of the actual system of letter-sound relationships operating in English, how do we know that what needs to be taught in order to impart the desired amount of ‘decoding’ skills is not so complex that it is simply unteachable to young children?

The problem is placed in sharp relief by researchers like Shaywitz (2003), who argue that words must be sounded out accurately by the phonics rules. While this accuracy goal is itself probably unrealistic, it is even more unrealistic to believe that it can be achieved via the highly simplified letter-sound patterns their studies typically employ.

The system of English phonics, as we shall demonstrate below, is far more complex than that which is typically taught in elementary classrooms. The latter, therefore, may be too inadequate to achieve its stated goal. And the actual system itself derives its degree of complexity from certain structural principles that directly challenge the notion that children must be subjected to intensive letter-sound instruction in order to become proficient readers.

As it stands, therefore, the gaping hole in the very foundation of the intensive phonics scientific edifice demonstrates that what its advocates are really saying is that children must be taught a highly simplified version of phonics, a gross caricature of the actual system. Given this, it certainly cannot be maintained that the consistent application of classroom-friendly letter-sound patterns to spelled words is capable of generating accurate pronunciations. But the question is also raised as to how it is at all possible that the teaching of a grossly simplified and imperfect set of patterns has the power to create readers out of nonreaders.

Not able to draw upon the force of a well-articulated model of letter-sound relationships, advocates of direct, intensive phonics instruction offer two other arguments for their position, one theoretical and the other
practical. The theoretical argument maintains that writing, whether alphabetic, as in English or classical Greek, or logographic, as in Chinese or ancient Sumerian cuneiform, is a cultural, unnatural, artificial representation of language. But the human brain, we are told, is hard-wired to process only spoken language, not written language. Since alphabetic writing is merely a code or notation for speech, a reader intent on interpreting alphabetic language must first turn it into its spoken form. The way to effect this print to sound conversion is by using rules that unlock the code. These are the rules of phonics. Now renaturalized to their biologically preferred oral form, the author’s words and phrases can be processed by the brain’s ordinary language processing mechanisms (see Lyon, 1997; Shaywitz, 2003).

The practical argument is that studies investigating the effectiveness of intensive phonics instruction in the classroom demonstrate significant improvement in various measures of reading proficiency. In the USA, the most widely cited study making this claim is the meta-analysis detailed in the Report of the National Reading Panel (NRP, 2000a), though serious discrepancies have been shown to exist between the phonics conclusions written into the widely distributed Summary Report (NRP, 2000b) and those found in the bulkier full report (cf. Garan, 2002).

Taken together, these theoretical and practical claims constitute the strongest possible argument for a wholesale rejection of five decades of meaning-centered, whole language-based research on reading, reading instruction, and reading assessment, and for replacing it with a decoding view of the reading process and a skills-based approach to classroom practice and assessment. When combined with the odd assertion that the technologically most advanced English speaking countries in the world are in the grips of a profound literacy crisis (Coverdell, 1998; Lyon, 1998), the obvious conclusion goes beyond the simple need for intensive, systematic phonics in the elementary reading curriculum: it must be imposed by and enforced from the highest levels of government.

But as we shall demonstrate later, these theoretical and practical arguments not only fail to compensate for the absence of an empirically based model of phonics, they also fail on their own merit. Writing is no less a form of language than speech. And studies that directly compare reading achievement in skills-based and meaning-centered classrooms clearly demonstrate the superiority of the latter – even in terms of children learning letter-sound relationships.

The following sections challenge the case for direct, systematic, intensive phonics instruction. First, we investigate the character of the English alphabetic writing system and demonstrate that, despite its alphabetic structure,
it exhibits many non-alphabetic, specifically, logographic, features. As a result, the phonics system in English is so drenched with complexities that it becomes more than obvious that serious concerns are in order about the prospects for success in using a phonics-heavy reading instruction program.

Second, we critique the theoretical and practical arguments that have given phonics an undeserved privileged status in the research, teaching, and assessment of reading. In the end, it becomes clear that the only pillars strong enough to hold up the phonics temple are political in nature. Insofar as intensive phonics is a political weapon wielded for a particular education agenda, the critique of the intensive phonics program requires not only an elucidation of the phonics system and challenges to the theoretical and practical claims of the phonics intensivists, but political clarification and political action as well.

The non-alphabetic character of English alphabetic writing

The fundamental flaw that advocates of intensive phonics instruction operate under is that alphabetic writing is strictly alphabetic. It is not. Of course, English spellings reflect the alphabetic nature of the writing system. But they also reflect, and to an impressive degree, non-alphabetic forces as well (Strauss, 2005).

In fact, the entire spelling landscape of English expresses an interaction between two opposing forces: alphabetic and logographic. The alphabetic force pushes spellings to be as regular and exception-free as the system can inherently allow. The logographic force pushes words to behave as wholes, as they do in logographic writing systems, where a symbol stands not for a sound, but for an entire word. Neither the individual stroke marks of Chinese characters nor the individual wedges of Sumerian cuneiform communicate any information about the pronunciation of the word. This means that their pronunciations are not predictable from the component elements of the script. The character as a whole must be identified.

The alphabetic force achieves maximal expression in words that are pronounced with perfectly regularity. These include examples like I, hi, pi, be, he, me, go, no, and so. The logographic force, on the other hand, achieves maximal expression in no words of English, because there are no examples like ṣꜥḥ, pronounced ‘cake’, in which not a single letter can be said to relate to the word’s pronunciation. Nevertheless, the logographic influence is seen when a portion of a spelled word exhibits pronunciation properties that are entirely unique and idiosyncratic to that word.

For example, said is the only spelled word of English where ai is
pronounced /E/. The phonics pattern ai is pronounced /E/ applies uniquely and idiosyncratically to that word. An accurate formulation of its phonics rule would be: In the word said, the digraph ai is pronounced /E/.

Similarly, the vowels of been, gone, son, sew, broad, and put are entirely unpredictable from the spellings; compare the regular seen, lone, con, new, road, and cut. The word one has an unpredictable initial /w/. In true logographic fashion, these words require their own, unique rules: In the word been, the digraph ee is pronounced /I/; in the word one, the initial sound is /w/; and so on.

Loanwords typically retain a native language spelling, even when that violates the usual phonic patterns of English. Simple examples are czar and Czech. The first requires the phonics rule: In the word czar, letter c is silent. The second requires the rule: In the word Czech, the pair Cz is pronounced /Č/.

Abbreviations like Cpt., Dr., Mr., Mrs., Sgt., and Wm. behave logographically. Each requires a unique, idiosyncratic rule to encode its pronunciation, which is otherwise entirely unpredictable from the available letters.

Finally, there are pure logographic forms that complement the alphabetic letters and appear alongside them in ordinary texts, and that are read in such a way that their logographic character hardly poses a special problem for any beginning or advanced reader. These are symbols like $, &, @, and =. Numbers like 1, 2.86, and 10–5 are also read according to rules that treat these, correctly, as logographic wholes.

The logographic force still operating in English alphabetic writing explains more than just the existence of pronunciations that are unpredictable from their spellings. In fact, it explains something far more significant, namely, why a written language like English tolerates such unpredictable aspects of its spellings, why the alphabetic force does not take a generation or two to simply level them, and why the early 20th century spelling reformers’ goal of complete alphabetic regularity was an unrealistic and scientifically baseless pipedream.

But recognizing that an alphabetic writing system tolerates spellings with unpredictable pronunciations leads to two important conclusions for reading researchers and classroom practitioners. The first is that letter-sound relationships, when viewed from the perspective of the entire system, exhibit great variability and complexity. This alone should argue against any program that regards intensive phonics instruction as the key to achieving reading proficiency.

The second is that reading must clearly be possible, in fact altogether unobstructed, when irregular spellings and their unpredictable pronunciations dot the phonic landscape. If this were not the case, then reading itself would be a sociopsycholinguistic force operating over time to level the irregularities. But this has not happened, and there is no sign that it ever
will. Unpredictable spellings are not litter on this landscape that can be easily collected and disposed of. They are a real, natural part of the English alphabetic world.

The regularity of logographic irregularity

An obvious objection to this interpretation of logographic spellings is that unpredictable spellings represent a marginal phenomenon of written English. The relatively small set of exceptions can simply be memorized as logographic wholes. The bulk of English spellings retain their adherence to alphabetic phonics patterns.

But the logographic principle pervades English spelling to a much greater degree than these exceptions suggest (Strauss, 2005). Indeed, the logographic principle resides within words that otherwise appear highly regular with respect to phonics patterns.

For example, the entire system of English inflectional suffixes is held back from pure alphabetic regularity by a functionally useful logographic force. Words like taps and tabs, bets and beds, and locks and logs contain a uniformly spelled plural suffix whose pronunciation alternates between voiceless /s/ and voiced /z/. The alternation is entirely predictable, with /s/ appearing after an immediately preceding voiceless consonant and /z/ appearing after an immediately preceding voiced consonant. The same pattern holds for the verbal ending s, as in he looks and he jogs; for the possessive ending ’s, as in Pat’s book and Pam’s book; and for the past tense suffix ed, which is voiceless /t/ in topped, washed, and lacked, and voiced /d/ in rubbed, jazzed, and logged.

A strictly alphabetic system would require that these suffixes be spelled according to their pronunciations, as s or z, and t or d. But to do so would sacrifice the advantage gained in retaining a single spelling for the suffixes, namely, that what is now represented in the unique spelling is the identity of an unchanging suffix despite superficial changes in its pronunciation. This is a logographic character of English spelling.

English orthography also tolerates distinct spellings of separate words that nevertheless have the same pronunciation. Well-known examples abound, like beet and beat, bow and bough, dense and dents, to and two, and so on. The important question is not whether these words are pronounced according to regular phonics patterns, but why distinct phonic regularities are retained even when the end result is an identical pronunciation. The answer is obvious. Retaining distinct spelling for distinct words, even when they are pronounced the same, communicates their logographic distinctness. The device of exploiting alphabetic symbols to express this logographic
phenomenon shows that even when a writing system is structurally alphabetic, it can function logographically.

Still, one might object that the logographic behavior of inflectional suffixes and homographic word pairs does not violate phonic regularity. Even though tabs is pronounced with a voiced /z/, this follows automatically from a regular phonic conversion of letter s to sound /s/, and an associated regular adjustment of sound /s/ to /z/ in the environment of an immediately preceding voiced consonant. The existence of pairs like beet and beat does not in itself argue against the phonic regularity that governs the pronunciation of the vowel digraphs ee and ea.

The phonic regularity of spelled words, however, also does not negate a logographic influence. In fact, the logographic principle operating in English alphabeticics does not stop at homographic suffixes and homophonic word pairs. It operates even in cases that otherwise appear to be quite regular from a phonics standpoint. Logographics pervades the entire alphabetic system. Words that we call ‘exceptions’ only appear that way if we take the alphabetic ideal to be the reality. When seen against the backdrop of a hybrid, alphabetic-logographic system, they can be thought of as ‘regular’ with respect to the logographic pole of the dichotomy. The reading process must be consistent with this hybrid reality, not with a non-existent alphabetic ideal.

Consider the word wind (a gusty wind). This word is pronounced with the short vowel sound /I/, and as such appears to be quite regular, since a general property of English phonics is that a vowel letter immediately followed by two consonant letters is pronounced short:

A: cast, hand, rank
E: best, lend, welt
I: hint, silk, wilt
O: frost, honk, loft
U: bust, dunk, tuft

A phonics lesson that taught this short vowel pattern would appear to hit the target correctly for the short vowel word wind.

But the word wind actually violates the pattern displayed with the class of words that end in ind. These are pronounced with an unexpected long vowel, as seen in bind, blind, find, grind, hind, kind, mind, rind, and wind (a wrist-watch). So even though wind (a gusty wind) is regular with respect to the usual short vowel rule, it is an exception to the rule governing the vowel pronunciation in ind words.

There is a discernible pattern at work. The basic, most regular rule for a vowel letter is for it to be pronounced long. This is because the long vowel
sound is what occurs when the vowel stands alone, with no restriction on preceding or following letters. The words a /ey/ and I /ay/ exhibit this long vowel characteristic (when the former is not reduced to schwa). And though there are no words e, o, and u, we can see that the long vowel sounds /iy/, /ow/, and /uw/ are what typically appear when the vowel letter is not followed by any consonant letter: he, he, me, she, we; fro, go, no, so; gnu, Su, tutu.

This means that the short vowel pronunciation in VCC letter strings (V = vowel letter, C = consonant letter) is really an exception pattern to the less restricted long vowel pattern. Furthermore, words in ind are exceptions to the VCC short vowel pattern. And the word wind is an exception to the ind long vowel pattern.

Notice that each time the new spelling class is identified it not only signals a switch back to the other vowel sound in the long-short pair. It can also only qualify as a sound-shifting class if it is a special instance of the class that immediately preceded it.

For example, a lone letter i identifies an entirely unrestricted class of spellings that contain the letter i. It includes the letter i by itself, as obtains in the word I, or letter i preceded or followed by any number of consonants, as in hi, hit, chip, hint, and so on.

Letter i in iCC is in a more restricted class. The sequence iCC is a special instance of lone i, since it not only contains the letter i, but also the immediately following letter sequence CC, i.e. a consonant pair. So, whereas iwa is a member of the class of words defined by the lone letter i, it is not a member of iCC, which requires two, not one consonant to immediately follow the vowel letter. In English, the sequence iCC signals a switch from the long vowel value of lone i to the short vowel sound.

But the sequence ind is a special instance of iCC, since letter i is followed not by any two consonants, but by the specific consonants nd. And ind signals a switch from the short vowel pattern of iCC back to the long vowel.

Finally, the word wind (a gusty wind) is a special instance of ind, since it contains letter i not only followed by nd, but also preceded by letter w, and with the entire letter string constituting the word wind. Again, word wind signals a switch from the long vowel pattern of ind back to the short vowel.

This phonic phenomenon can be depicted as follows:

\[
\begin{array}{l}
i /ay/: \quad I, hi, pi \\
iCC /I/: \quad lint, wisp \\
ind /ay/: \quad mind, rind \\
wind /I/: \quad wind (a gusty wind)
\end{array}
\]

This sequence of forms shows the ordered arrangement of spelling classes that signal a switch in the sound assigned to the vowel letter i. The
empirical observation that makes this theoretically interesting is that a switch can occur only if the switching spelling class is a special instance of the spelling class immediately above it.

Of course, there is no switching in the first two classes. Lone letter i defines the basic value of the letter, long /ay/. The next line defines its most regular variant, short /I/. After that, the back and forth pattern shows itself.

This characteristic of English phonics demonstrates that words which appear to be regular may be so only because they are double exceptions, or exceptions to exceptions, or double negatives, so to speak. Thus, the word wind is an exception to the ind pattern, which is an exception to the iCC pattern. The two exceptions cancel out, thereby making wind subject to the iCC pattern. Hence it is pronounced with a short vowel. But the apparently regularly pronounced word is actually an idiosyncratic, logographic exception to two patterns.

The word wind (a wristwatch), on the other hand, is not an idiosyncratic exception to the ind pattern. It behaves as do the ind words in general. These are exceptions to the iCC pattern, which means they undergo the pattern for lone i. They are pronounced long. Clearly, the English phonics system must rise above mere letter-sound relationships and make a distinction between the word wind (a gusty wind) and the word wind (wind a wristwatch). The letters alone are unable to uniquely specify the pronunciation.

This logographic phonics phenomenon exhibited by the word wind (a gusty wind) shows up in numerous other cases. It is hardly an isolated phenomenon. Consider, for example, the word doll. This appears to be regular with respect to the short vowel pattern for words with vowel letter o in front of two consonant letters. Thus, we have cost, frost, loft, honk, and so on. But olC words behave differently. They are typically pronounced with a long vowel sound, as in old, bold, roll, bolt, fold, folk, gold, hold, mold, molt, noll, poll, Polk (President James), roll, sold, told, and toll.

In other words, olC words are exceptions to the oCC pattern. They signal a switch in the phonic value of the letter o. However, now we can see that doll is an idiosyncratic, logographic exception to the olC pattern, and it too, as the lone member of its class, signals a switch back to the short sound. The word doll is an exception to the olC pattern, which is an exception to the oCC pattern, which means that it undergoes the oCC pattern and acquires a short pronunciation. Again, what appears to be a perfectly regular form is only apparently so, since it actually is an idiosyncratic, i.e. logographic exception to a pattern which is itself an exception to a more general pattern. The two exceptions cancel out and yield a word that is thus superficially regular.

The names Hugh and Pugh exhibit the pronunciation for letter u that it
would have if it were followed by no letters at all (see earlier). Perhaps this is related to the silent value of the final gh. Alternatively, we can observe that Cugh as a class is an exception to the general pattern seen in uCC words. The latter, as expected, are pronounced with a short vowel sound, as in bump, dust, hulk, skunk, and so on. The letter string is Cugh is a special instance of uCC, and therefore qualifies as a potential exception class. As such, it can signal a switch from the short vowel sound of uCC words to the long vowel sound. The words Hugh and Pugh demonstrate that it does indeed behave this way. Cugh words are exceptions to the uCC pattern, which means they undergo the long vowel pattern for lone u.

Switching examples abound. Words in uild, like build and guild, appear to have a regular, short pronunciation. But they actually are exceptions to the long vowel pattern seen in ild words: child, mild, wild. They qualify as potential exceptions since uild words are a special instance of ild words. Therefore, uild signals a switch from the long vowel pattern for ild words to the short vowel.

Apart from revealing how words that superficially appear to be phonically regular in fact express the properties of embedded exception classes, these examples indicate something even more significant. The final letter string in a connected sequence of phonics patterns can be unambiguously logographic, since it can identify a single, specific word, like wind or doll. It may identify an otherwise arbitrary class defined by a certain spelling, like uild words or Cugh words. These also exhibit perfectly regular phonic features along with less than perfectly regular ones, and are therefore alphabetic-logographic hybrids.

Sometimes each individual word in a whole collection of words must be characterized as an exception to a phonics pattern, which means that each one carries a logographic exception quality. Consider the words ghost, host, most, and post. These long vowel words are exceptions to the more general oCC pattern, seen in examples like cost, frost, and lost. But there is nothing in the spellings of these words that predicts which ones are in the long vowel group and which are in the short vowel group. The sorting is entirely arbitrary, from a phonics standpoint. The individual word ghost must be marked as an exception to the regular oCC pattern, as must host, most, post, and so on. Each one, therefore, is a logographic piece in the English phonics puzzle.

The words brow, brown, chow, clown, cow, frown, gown, how, howl, jowl, now, pow, vow, and wow are regular short vowel words, but contrast with the long vowel exceptions blow, grow, grown, low, mow, know, row, and tow. The latter are exceptions to the oCC pattern, and must therefore undergo the long vowel decoding for lone o. That the list of exception words is entirely idiosyncratic, i.e. logographic in nature, can be seen from the existence of minimal
pairs bow (flex at the hips) and bow (bow and arrow), and sow (pig) and sow (cultivate).

For a more formal characterization of these and many other examples of the systematic interaction of basic phonics patterns and their successively more narrow classes of exceptions, see Strauss (2005).

**Flaws in the intensive phonics program**

We have seen how the logographic force expresses itself in English phonics. It shows up to the extent that the pronunciation of written words departs, from the ideal alphabetic norm, which would be complete regularity. The logographic character of English alphabetics appears in the widespread stability of homographs (distinct words with identical spellings) and inflectional spellings (stable spellings despite variable pronunciation), in the pervasiveness of abbreviations, and in the stability of script that combines alphabetic spelling with clearly logographic characters ($, &, etc.). And it shows up in the existence of an abundance of words that appear to be phonically regular on the surface, but which, on further inspection, are actually exceptions to exceptions. Such exceptions to exceptions turn into apparent regularities, and thereby conceal their underlying exceptional characteristics. But this embedded exception phenomenon shows itself quite strikingly via words that wear their exceptional pronunciations right on the surface, like those defined by spellings in ild, ind, olC, and Cugh.

Given the pervasive logographic character of English alphabetics, the burden of proof now clearly falls on those who would advocate intensive phonics instruction in the classroom to provide evidence that such instruction is the key to learning how to read. By definition, the entire logographic topography of English defies phonic regularity. Yet there is a now a politically driven, renewed emphasis on intensive teaching of phonics. Such emphasis implicitly insists that, despite the hybrid character of English spelling-sound relationships, there is both theoretical plausibility and empirical justification in elevating one portion of the English lexicon to a privileged position. Neither, however, can be defended.

Advocates of phonics instruction in the classroom fall into one of two groups. On the one hand, there are scholars like Venezky (1999) who argue as follows:

Phonics is a means to an end, not an end itself. Its functions are somewhat speculative, but most scholars agree that at least three are crucial to the acquisition of competent reading habits. One is to provide a process for approximating the sound of a word known from listening but not recognized quickly by sight. For this to work, decoding patterns need not generate perfect representations of
speech. Instead they need to get the reader close enough that, with context, the correct identification can be made. (Venezky, 1999: 231)

One only has to look at the complexity of Venezky’s phonics rules to appreciate why he does not regard them as instructionally adequate on their own.

On the other hand, there are scholars like Reid Lyon, former director of the reading research branch of the National Institute of Child Health and Human Development, and one of the key architects of No Child Left Behind, who insist on the privileged character of phonics, claiming that any reliance on contextual information or other non-phonics information is misguided:

Surprisingly, and in contrast to what conventional wisdom has suggested in the past, expert readers do not use the surrounding context to figure out a word they’ve never seen before. The strategy of choice for expert readers is to actually fixate on that word and decode it to sound using phonics. (cited in Clowes, 1999: para.7, emphasis in original)

The problem with Venezky’s notion is that once it is acknowledged that phonics is insufficient by itself in achieving its stated goal (for example, word identification), one is now obligated to investigate just how much of a role is played by the other cognitive resources available to a reader (syntax, semantics, background). Empirical investigations may demonstrate, as miscue analysis has, that phonics is a distinctly inferior cuing system, one hardly deserving any privileged status (Flurkey and Xu, 2003).

Lyon’s phonics is, as he says, ‘surprising’. Even if phonics played a major role in word identification and meaning construction, his theoretical rejection of contextual information renders his model so emaciated that it cannot explain the most elementary facts of reading. Readers, like listeners, anticipate upcoming words before they are seen or heard. But phonics, by definition, is not available when a word is not yet seen. So if a reader anticipates a word that will appear only after the page is turned, then even if phonics patterns are now invoked, their role will be to supplement the reader’s psycholinguistically-based guess (Goodman, 1967) made on the previous page, not to initiate a decoding-to-identification process.

Lyon’s acontextual theory cannot explain how readers develop a special vocabulary of words they have only seen in print and have never heard. His theory assumes that every word of the written language has first become familiar to the reader as a spoken word. But every reader knows of words that are encountered only in print, and often is surprised to find out that the conventional pronunciation is not what he or she imagined it to be.

Lyon’s theory is surprising precisely because it would require the
suppression of otherwise quite natural mental processes. When a reader guesses at an upcoming, still unseen word, or at a word completely unrecognizable from the spoken language, Lyon would have us believe that this quite natural strategy on the part of the reader should actually be suppressed in favor of phonics rules which, in this case, are of no benefit anyway. He is in favor of converting letters to sounds because of the supposed naturalness of spoken language and artificiality of written language. But he opposes the obvious naturalness of intelligent guessing based on the reader’s recruitment of contextual information.

Shaywitz (2003) elaborates Lyon’s position. Echoing the viewpoint of behaviorist linguists from the early 20th century, she takes the position that phonics is indispensable because alphabetic writing is merely a ‘phonetic code’ (Shaywitz, 2003: 50), in which letter stimuli trigger vocal responses. This means that there is really no such thing as written language, only symbols to be deciphered in order to turn the script into the natural, spoken form.

Shaywitz then argues that the human brain is naturally equipped to process only oral language. ‘The reader must somehow convert the print on a page into a linguistic code – the phonetic code, the only code recognized and accepted by the language system’ (Shaywitz, 2003: 50). Then, ‘translated into the phonetic code, printed words are now accepted by the neural circuitry already in place for processing spoken language. Decoded into phonemes, words are processed automatically by the language system’ (Shaywitz, 2003: 51).

In other words, visual symbols must be turned into the sounds they stand for so that the brain can then process the author’s language. In fact, the decoding must be ‘accurate’, since anything short of complete accuracy will be unable to find the location of the spoken word in the brain’s stored mental lexicon. Contextual information is simply unavailable. Guessing is not allowed. Decoding, in this sense, is akin to having to type someone’s email address with no errors whatsoever, since any error will prevent the blind processing of the hardware from finding the right mailbox.

Reading, in other words, is nothing more than the conversion of print to sound. And this is because written language is not language: ‘Writing is not language, but merely a way of recording language by visible marks’ (Shaywitz, 2003: 50).

Shaywitz’s claimed scientific coup de grâce is the demonstration that neuroimaging machines can show exactly where in the brain phonic decoding occurs. In fact, the machines show that such decoding occurs in certain sites for normal readers and in different sites for problem readers. But following intensive phonics instruction, she claims, neuroimaging

311
technology reveals that the previously poor readers are now decoding in the normal decoding regions. She concludes that intensive phonics instruction can lead to ‘brain repair’ (Shaywitz, 2003: 86).

Unfortunately, the nice-sounding Lyon-Shaywitz theory bears no resemblance to the real world of reading. We shall address each of its claims in turn.

The Lyon-Shaywitz extreme phonics position maintains that written words are identified by sounding them out, and by no other strategy or process. But an appreciation of the real complexity of phonics patterns would note that many words cannot be sounded out unless their identity is first established. For example, it is impossible to predict, on the basis of general patterns, how the spelled words do, to, son, done, one, said, was, sew, and so on are pronounced.

And, as we have discussed, the problem does not hold true only for such sight words. It extends to the entire range of words that occupy the logographic end of sequenced phonics patterns. This includes not only isolated examples like wind and doll, but whole classes of words, as we have seen, like chow, cow, dow, frown, gown, howl, now, owl, plow, pow, vow, and wow, which are idiosyncratically distinguished from crow, grow, grown, low, mow, know, known, own, row, stow, and tow, or ghost, host, most, and post, which must be distinguished from cost, frost, and lost. The arbitrariness exhibited by the minimal pairs bow (flex at the hips) and how (tie a bow), and sow (pig) and sow (cultivate), further shows that whether an owC word fits into one class or the other must simply be memorized. That means that the word must already be identified in order to know which phonics pattern it exhibits. But the necessity of word identification prior to the activation of phonics rules completely undermines the program of intensive phonics.

Many linguists are fond of pointing to those differences between written and oral language that suggest some fundamental, qualitative chasm between the two. The most widely cited difference is that all normal humans learn spoken language, though written language learning is a historically late appearing, culturally defined phenomenon (Lenneberg, 1967). As a consequence, we are told, written language is an artificial, cultural artifact. Only spoken language is biologically based. Only spoken language can be learned naturally without any instruction.

But the historical evolution of writing merely argues that written language is a relatively late appearing form of language, not that it is less than language. And the outward form can hardly be the defining criterion for human language. Otherwise, sign language would also not qualify, though linguists have had no problem counting this as natural, human language (Klima and Bellugi, 1979).
The claim that natural language is learned at an early age, without any special instruction, is essentially correct. Whereas this characteristic would group together sign language with oral language, it has been invoked to uphold the supposed unnaturalness of written language. The latter is allegedly learned late and requires instruction.

Except that this is also untrue. It has been well-documented that, with no necessary instruction, children enter school having learned a great deal about the communicative functions of print (Owocki and Goodman, 2002). Such learning occurs via a purposeful interaction with the print-laden environment. The claim that written language is always learned later on, after the oral language facility is already well established, is just the distorted perception that is created when pre-school print awareness remains unappreciated, and when, for good reason, no social experiment has been conducted that deprives subjects of oral language input in order to test isolated written language development.

The finding from neuroimaging research that there is a specific brain region for phonological processing bears very little on questions about reading and reading instruction. By itself, the identification of a brain site says more about the neuroimaging technology than it does about the reading process. This is because brain images of letter-to-sound decoding sites have not been constructed on the basis of subjects doing anything that resembles real reading. In a typical study, readers are asked to press Yes or No on a console after two letter strings are flashed on a monitor in the imaging machine. These strings can be nonwords, like lete and jeat (Shaywitz, 2003). Since knowledge of phonics patterns is the only language resource that can be recruited in order to decide whether visual lete and jeat orally rhyme, the only way to characterize those brain sites that light up when the subject performs this task is that they are sites of letter-sound processing. But the only scientifically justified conclusion that can be drawn from this is that the neuroimaging machine is sensitive enough to detect sites of letter-sound processing when a subject is given a task that taps into that cognitive activity. The task itself is not one that can be validly generalized to real reading, so further conclusions about the brain and reading are entirely unwarranted.

Shaywitz (2003) has claimed that neuroimaging research reveals that a poor reader with a ‘functionally abnormal’ brain can literally undergo ‘brain repair’ when provided with direct, intensive phonics instruction. This assertion is based on the finding that activated brain sites for phonological processing tasks obtained prior to intensive instruction are not the ones seen in normal, proficient readers. But after intensive phonics instruction, follow-up brain imaging studies show that the expected sites are now activated.
This line of reasoning is a piece of modern day sophistry. We are supposed to believe that there is something literally wrong with the subject’s brain that is literally erased by exposure to intensive phonics instruction. At the very least, such an unprecedented finding should prompt neurologists far and wide to look for educational treatments for a whole range of neurologic diseases.

But there is no documented abnormality in the brains of the poor readers. Shaywitz herself notes that their brain MRIs are normal. That is why she invokes the term ‘functional’. The brains are functionally abnormal, not physically abnormal. This is supposed to mean that, despite possessing anatomically normal brains, poor readers process letters in abnormal ways. Following intensive phonics instruction, they now process letters in the normal way.

In reply to an article with an identical claim (Simos et al., 2002), editors of the journal Neurology corrected the interpretation of this argument. ‘This only means that intensive phonics instruction taught the poor readers to do something different (or differently) than what they had been doing. The real question is why they were doing it differently to begin with’ (Rosenberger and Rottenberg, 2002: 1140).

A further blow to the Lyon-Shaywitz approach is that recent research shows that children in intensive phonics classrooms do not learn phonics patterns any better than children in a literature-based classroom (Arya et al., 2005). A study of 109 second graders in four contrasting reading programs was conducted in a large US mid-Atlantic metropolitan area. The majority of students were from low-income families (qualified for free and reduced lunch), all were native or proficient speakers of English, and were not receiving Special Education services. All study participants had been taught using their respective programs for a full two years.

Two of the programs studied were among the most widely mandated commercial phonics based reading programs in the USA: Open Court and SRA Reading Mastery (known as DI for Direct Instruction), both published by the McGraw-Hill companies and aligned with the ‘Reading First’ section of the No Child Left Behind Act of 2001. The other two schools used noncommercial literature based programs that focused more on the use of multiple strategies and comprehension and did not follow a systematic phonics scheme. One of these schools used a version of Guided Reading (Fountas and Pinnell, 2001) and taught in large and small groups using leveled, authentic literature. The other school used a district designed, literature based, holistic approach that stressed independent reading and writing and focused on comprehension. When phonics instruction occurred, it was embedded within meaningful reading and writing.
contexts. Teachers identified students as either high, middle or low readers, resulting in close to equal numbers of participants in each category across the entire study population.

This study was unique in that it used as its data source the oral readings and retellings of each student rather than standardized test data to evaluate program effectiveness. The design permitted an examination of the impact of each program on the reading strategies and comprehension of students reading authentic children’s literature. Standard miscue analysis procedures and retelling protocols were utilized to analyze the oral reading and retelling data (Goodman et al., 2005). Each student was also individually tested on the phonics subtest of the Woodcock Johnson Psycho-Educational Battery (Woodcock et al., 1990), which generated a standard score and percentile rank for their phonics skill. Further ethnographic data was collected, including interviews with students and teachers, and field notes from in-depth classroom observations.

For the purpose of this article, we will report the differences that were found between the students in the phonics vs literature based programs in regard to: their use of graphophonics and meaning during the text reading; their comprehension as revealed by their retellings; and their performance on the Woodcock Johnson phonics subtest. (For more complete findings see Altwerger, 2005; Altwerger et al., forthcoming.)

Contrary to the recommendations of the National Reading Panel Report (2000) in the USA and the Independent Review of the Teaching of Early Reading (2006) (known as the Rose Report) in Great Britain, it was found that the two systematic, intensive phonics programs did not result in greater use of phonic cues during reading. That is, there was no significant difference between the literature based and phonics based programs in readers’ use of phonic relationships as revealed through their miscues. There was, however, a significant difference in the percentage of miscues that resulted in loss of meaning. The students in the two phonics based programs produced a significantly higher percentage of miscues that resulted in a loss of meaning. Furthermore, they were significantly less likely to attempt self-correction of their miscues, even when they did not make sense in the text. Analysis of the retellings revealed that the literature based programs are at an advantage for comprehension of the stories, with higher overall scores (though not statistically significant), and a deeper understanding as reflected in their inferences and connections. Phonics based students generally retold the surface features of the text, such as the major events (Martens et. al., 2005).

Perhaps most surprising were the results of the Woodcock-Johnson phonics subtest. No significant difference was found between the scores of
students in the phonics based and literature based programs at any reading level. Furthermore, a significant negative correlation was found between phonics and retelling scores, such that the higher the phonics scores, the lower the retelling scores. Some of the highest retellers in the study had the lowest phonics scores. This challenges the automaticity theory (underlying both the NRP and Rose Reports), which posits that a high level of phonics skill facilitates comprehension by freeing the reader’s limited attentional capacity from the task of decoding to the task of meaning construction.

The results of this study suggest that intensive, systematic phonics programs are not superior to literature based programs in developing students’ decontextualized phonics skills or contextualized use of phonics cues by the end of second grade. Despite current federal policies in both the USA and Britain, as well as the pronouncements of influential researchers like Shaywitz and Lyon, this study of over 100 second graders indicates that after 2 years of intensive, systematic phonics instruction, students had no advantage in phonics and a distinct disadvantage in comprehension as compared to students immersed in meaning-focused, literature based programs.

Summary

Arguments against the theory and practice of intensive, direct phonics instruction have appeared in major, peer-reviewed journals, in books by some of the field’s leading and most respected scholars, and at conference presentations of the most important organizations of teachers and educators. It can hardly be denied that large numbers of researchers and classroom practitioners have serious problems abandoning their beliefs in order to serve their government’s mandates (Guardian, 2005; New York Times, 2007).

Yet government imposition of intensive, direct phonics instruction is the only reason this cachetic approach to reading is in public school classrooms to the extent that it is. Researchers know that it is for political reasons alone that their proposals for studying meaning-centered hypotheses about how children make sense of print are not being funded. Classroom teachers know that they are simply following orders when they abandon real literature in favor of hours and hours of boring blends and demeaning digraphs.

The imposition of direct, intensive phonics has come from the very highest levels of government, via the so-called No Child Left Behind Act (NCLB) in the USA and the Primary Framework for Literacy and Mathematics in Great Britain. In addition to making phonics the only legal approach to the teaching of reading in public schools (private schools are exempt), NCLB
has mandated ‘high-stakes testing’ in the USA that pressures schools to achieve ‘adequate yearly progress’ (AYP) in order to maintain supplemental federal funding. Yet, the bipartisan-supported NCLB was hardly discussed and debated by those most affected by it – students, teachers, and parents. Its approval by Congress followed an unfortunately familiar script, one that we have all heard in other contexts.

The first step on the road to NCLB was to convince the public that the USA was in the midst of a serious literacy crisis, one that constituted a ‘public health’ concern, given the association between illiteracy and drug use, crime, and poverty (Lyon, 1998). The crisis was blamed on a generation of lax, unscientific, whole-language inspired approaches to reading instruction. Evidence was presented to ‘prove’ that whole language was the culprit and that direct, intensive phonics instruction was the only scientifically defensible approach (for an accessible review, cf. Rayner et al., 2002). The scientific evidence was presented to Congress in the form of the Report of the NRP. NCLB was approved to deal with the crisis. Subsequently, the report itself was found to be seriously flawed, even filled with unsupported ‘intelligence’ information (Garan, 2002). The government spokespeople at first defended their position. But cracks continued to appear, until more than one panel member finally admitted that there were significant errors and ‘misrepresentations’ (Foorman et al., 2003). Despite these acknowledged misrepresentations and weaknesses, a leading panel member declared that we were still right in sending direct, intensive phonics instruction into the classroom (Shanahan, 2005). The result has been an unadulterated disaster, with teachers and students suffering both direct and collateral damage.

This disastrous turn of events in US public school education cannot be reversed by merely attending to the best scientific arguments. This is because the driving force behind the new classroom environment has never been science anyway. It has been the political agenda of the leading sectors of corporate America to create a new workforce whose level of ‘digital literacy’ for the new global ‘knowledge economy’ will allow the corporate owners and professional investors to maintain their hegemonic competitiveness (Business Roundtable, 2000).

This means that scientific arguments must be supplemented with political organization. Such political organization is certainly the more difficult of the two. But the end result will be all the more rewarding – the ending of the government occupation of the classroom and the democratization of curriculum and assessment.
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