English spelling and its contribution to illiteracy: word difficulty for common English words

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Abstract

Writing like all technologies can be implemented in different ways with varying efficiencies. It is often not recognised that the written form of English is at variance with a majority of other alphabetic scripts and is increasingly being seen as a contributing factor to illiteracy in the English-speaking world.

The predictive spelling and reading model developed at Hull University indicates that the contributing factors making English words difficult for children to spell are: word frequency, length and phoneticity.

This paper, using the most frequent 150 words in the English language, confirms results from earlier studies and clearly links word characteristics to literacy failure. The impact of obscure forms of phoneme representation is shown to be particularly noticeable with less able children. This unnecessary burden placed on young children is not present in most European languages which have more regular written forms than English. The implications from this and previous studies are related to the teaching of English literacy skills.

Introduction

In a recent paper (Spencer, 1999a) I suggested that the individual characteristics of words could be used to predict the level of difficulty for spelling and, perhaps, reading. Most research investigating reading and spelling difficulties in children and adults has tended to look at the human characteristics to account for deficits. My approach was to turn the tables on the English language, and to use the words as my subjects. This approach relates to language and writing as technologies, and considers the efficiency of written language in much the same way that we would evaluate the efficiency of other technologies. Language is a powerful tool and its power is greatly extended by technologies which fix it into a permanent written form. However, writing is so ubiquitous and embedded in daily life that it is often not recognised as being a technology. Further, English has become such a dominant international language that it is often forgotten that its written form differs from most other alphabetic languages. It has even been suggested that English is a dyslexic language (Spencer, 2000). This perspective views written English as a defective technology. We have come to recognize the consequences of employing defective technologies: their use will incur additional costs, which in the case of written language will mean higher rates of illiteracy, and more energy and time spent in learning.

The 150 words investigated in this study represent 60% of the words used by 7 year-olds in their writing (Reid, 1989). Tables 1(a–d) give descriptive information about each word. Word frequency was obtained from the Lancaster/Oslo-Bergen Corpus (Hofland and Johansson, 1982) of one million words. In previous studies word length, measured by the number of letters, was found to be a significant factor in predicting spelling difficulty, but this rather underestimates the complexity of this component. In a perfect orthography there would be one letter for each sound and the number of sounds would exactly match the number of letters. This is not the case with English, although some languages do approach this degree of correspondence. English words usually have more letters than sounds, and it is this discrepancy (the phonetic difference) which is one of the main factors linked to spelling difficulty. The nature of English orthography means that individual sounds, of which there are 44, are associated with varying numbers of letter combinations, and it has been suggested that the ratio of sounds to letter combinations is 1:28 for the English language! I have demonstrated in previous research (Spencer, 1998, 1999b & 2000) that the relative frequency of representations for a given sound is related to spelling difficulty for a word: the more frequently a grapheme is associated with a sound, the easier it is to spell.

In this, and previous, studies the phoneticity, for a sound or word, is based on the most common 7,000 English words, which were analysed in terms of the different phonemes (20,000) and their associated forms of representation. For each phoneme the frequency of each form of representation was calculated and expressed as a percentage of all instances of the phoneme. For example, the "hard-o" sound is usually represented by "o" [50%] or "o + magic e" [21%], but occasionally by "oa" [5%] or "oe" [1%].

Table 1a: Easy Words

Word	Tricky Phoneme Value	Graphemic Length	Phonemic Length	Phonetic Difference	Frequency per million	% Correct Score
in	71	2	2	0	21108	100.0
is	69	2	2	0	10978	100.0
it	71	2	2	0	10010	99.6
man	95	3	3	0	1072	99.6
and	92	3	3	0	27856	99.6
the	17	3	2	1	68315	99.6
get	90	3	3	0	735	99.2
on	93	2	2	0	7027	98.7
he	21	2	2	0	8776	98.7
up	68	2	2	0	1860	98.7
can	70	3	3	0	1675	98.3
into	17	4	4	0	1657	98.3
not	93	3	3	0	5142	98.2
but	68	3	3	0	4956	97.9
at	96	2	2	0	6043	97.8
go	54	2	2	0	714	97.5
me	21	2	2	0	1554	97.0
an	97	2	2	0	3467	96.6
his	69	3	3	0	6266	96.6
we	21	2	2	0	2926	96.6
day	8	3	2	1	600	96.6
had	92	3	3	0	5391	96.2
men	90	3	3	0	616	96.2
if	71	2	2	0	2479	96.2
one	1	3	3	0	3088	95.7
will	10	4	3	1	2269	95.6
him	71	3	3	0	2258	95.3
as	69	2	2	0	7337	94.8
you	3	3	2	1	3590	94.4
from	84	4	4	0	4686	94.4
that	96	4	3	1	11188	94.0
no	54	2	2	0	2393	94.0
did	71	3	3	0	884	94.0
us	68	2	2	0	657	94.0
she	21	3	2	1	3912	93.7
old	54	3	3	0	670	93.7
my	10	2	2	0	1813	93.6
was	5	3	3	0	10499	93.6
has	69	3	3	0	2802	93.5
see	10	3	2	1	814	93.4
last	40	4	4	0	870	93.4
well	10	4	3	1	1009	92.9
good	70	4	3	1	900	92.9
be	21	2	2	0	7186	92.8
have	32	4	3	1	4592	92.8
its	63	3	3	0	1516	92.8
then	90	4	3	1	1546	92.4
do	8	2	2	0	1478	92.4
them	90	4	3	1	1699	91.5
this	63	4	3	1	5287	90.8
Mean	**55**	**3**	**3**	**0**	**5723**	**95.7**

Table 1b: Moderate Words

Word	Tricky Phoneme Value	Graphemic Length	Phonemic Length	Phonetic Difference	Frequency per million	% Correct Score
how	26	3	2	1	873	89.9
now	26	3	2	1	1489	89.9
three	10	5	3	2	697	89.9
her	45	3	2	1	4030	89.7
out	74	3	2	1	2035	89.7
came	48	4	3	1	645	89.4
all	6	3	2	1	2940	89.3
so	54	2	2	0	2413	89.3
went	64	4	4	0	594	89.3
lsong	53	4	3	1	750	89.1
said	1	4	3	1	2074	88.9
for	49	3	2	1	9299	88.6
may	8	3	2	1	1447	88.5
like	13	4	3	1	1205	88.4
come	0	4	3	1	676	88.0
with	64	4	3	1	7197	87.3
time	33	4	3	1	1654	87.1
are	1	3	1	2	4544	86.9
when	12	4	3	1	2540	86.9
make	13	4	3	1	796	86.7
two	1	3	2	1	1549	86.6
or	49	2	1	1	3781	86.5
back	5	4	3	1	934	86.3
down	26	4	3	1	885	86.3
to	8	2	2	0	26760	86.3
some	0	4	3	1	1851	85.9
they	1	4	2	2	3579	85.9
new	3	3	3	0	1181	85.0
than	97	4	3	1	1646	85.0
way	8	3	2	1	941	84.9
more	7	4	2	2	2183	84.5
what	5	4	3	1	1872	84.5
under	19	5	4	1	645	84.2
even	1	4	3	1	999	84.2
same	48	4	3	1	768	84.2
much	55	4	3	1	1071	84.1
made	48	4	3	1	1294	84.0
after	19	5	4	1	1119	83.7
very	64	4	4	0	1229	83.7
year	9	4	2	2	677	83.7
over	19	4	3	1	1264	83.6
most	54	4	4	0	1059	83.5
without	64	7	5	2	665	83.1
your	5	4	2	2	853	82.4
must	63	4	4	0	1129	82.4
just	25	4	4	0	836	81.9
take	13	4	3	1	639	81.9
say	8	3	2	1	635	81.5
life	33	4	3	1	684	80.2
Mean	**28**	**4**	**3**	**1**	**2258**	**86.0**

Table 1c: Difficult Words

Word	Tricky Phoneme Value	Graphemic Length	Phonemic Length	Phonetic Difference	Frequency per million	% Correct Score
by	10	2	2	0	5796	80.1
never	19	5	4	1	686	79.8
about	25	5	4	1	1895	79.5
found	74	5	4	1	624	78.5
of	1	2	2	0	35716	78.0
work	8	4	3	1	819	76.9
still	10	5	4	1	823	76.8
both	54	4	3	1	675	76.5
little	4	6	4	2	895	76.4
our	1	3	2	1	1228	76.4
here	6	4	2	2	717	75.5
such	55	4	3	1	1125	74.7
could	4	5	3	2	1614	74.6
each	12	4	2	2	654	73.8
first	14	5	4	1	1287	73.4
own	17	3	2	1	751	72.5
been	10	4	3	1	3116	72.3
people	0	6	4	2	953	72.2
being	9	5	4	1	961	71.7
right	9	5	3	2	599	71.3
who	1	3	2	1	2200	70.9
only	54	4	4	0	1813	70.9
because	0	7	5	2	777	70.8
would	4	5	3	2	2682	70.4
world	8	5	4	1	594	69.4
other	19	5	3	2	1533	69.2
these	9	5	3	2	1501	69.1
there	19	5	2	3	3180	68.8
might	9	5	3	2	781	66.8
also	6	4	4	0	994	66.7
again	1	5	4	1	663	65.2
before	7	6	4	2	1061	65.0
another	19	7	5	2	668	63.1
too	12	3	2	1	923	62.8
between	10	7	6	1	867	62.2
any	1	3	3	0	1416	62.0
many	1	4	4	0	1029	61.9
should	4	6	3	3	1276	61.4
used	7	4	4	0	648	61.4
where	12	5	2	3	1033	60.1
great	2	5	4	1	702	59.7
know	1	4	2	2	798	59.7
were	1	4	2	2	3400	57.9
those	21	5	3	2	957	57.5
which	12	5	3	2	4467	56.2
while	12	5	3	2	590	54.6
their	1	5	2	3	2808	50.2
through	1	7	3	4	773	47.9
thought	3	7	3	4	611	40.8
though	1	6	2	4	623	35.4
course	4	6	3	3	588	33.8
Mean	**12**	**5**	**3**	**2**	**1942**	**66.1**

Table 1d: Mean values for word groups

Word	Tricky Phoneme Value	Graphemic Length	Phonemic Length	Phonetic Difference	Frequency per million	% Correct Score
Easy	54.8	2.9	2.6	0.3	5723.3	95.7
Moderate	27.7	3.8	2.8	1.0	2257.7	86.0
Difficult	11.5	4.8	3.2	1.6	2019.9	66.1

When looking at word composition the phoneme which has the lowest phoneticity value has been identified as making a major contribution to spelling difficulty. This weakest element in a word is termed the "tricky" phoneme value, and small values reflect few instances of a grapheme, or grapheme configuration, representing the particular sound. Low "tricky" values tend to make a word difficult to spell.

Data collection

The spelling data were collected, during June 1999, for all pupils in an urban Hull primary school, which performs at average national levels in English, maths and science. The collected data of spelling performance spanned five year groupings (Y2–Y6; ages 7 to 11 years), for a total of 306 pupils. Details of the ages, reading quotients and spelling scores for each year group are shown in Table 2. Reading quotients (obtained from the school's records) were based on the administration of several standardised reading tests that are widely used in UK schools.

The 150 words were randomly assigned to five lists of 30 words, which were administered on five consecutive days. Class teachers administered the spelling tests, giving the word followed by an example sentence, and a further repetition of the word. There was no time limit for the test. Pupils wrote their answers on forms with word numbers clearly indicated. The marking for the test demanded complete mastery: pupil responses were marked as incorrect if the spelling was not perfect.

Results of the whole-school test

The 150 words used in this study are from a very different frequency range when compared with the previous studies. For example, only 8% of words from earlier studies fell within the frequency range of the most common 150 words (588 to 67,727 occurrences per million). However, when analysed, the same underlying factors controlled the spelling difficulty for these words.

The analysis of the data was undertaken with the Statistical Package for the Social Sciences (SPSS, version 9). To determine how the various factors contributed to spelling difficulty, regression methods were applied. These use the presence of an association between two variables to predict the values of one from those of another. The regression analysis of the data predicted the spelling behaviour of pupils on the basis of four factors: frequency, number of phonemes in a word, the difference between the number of phonemes and graphemes (phonetic difference), and phoneticity ("tricky" phoneme value). All these factors are highly significant across the five years (Y2 to Y6), except for word frequency in Y4, and number of phonemes in Y6. Between 40% and 60% of the spelling variability was explained by the four word factors.

The inter-correlations between the spelling scores for the 5 year groups were highly significant [mean 0.8], and on this basis the entire data set was combined and a further analysis conducted. The four factors

Table 2: Mean values & S.D.s for age, reading quotient and spelling score for years Y2 to Y6

	Y2	Y3	Y4	Y5	Y6
Mean Age	6.93	7.93	8.86	9.46	10.83
SD	0.32	0.30	0.33	0.94	0.30
Mean Reading Score*	100.08	102.38	95.23	96.26	96.66
SD	11.82	12.19	11.28	11.40	11.08
Mean % Score	64.02	77.60	86.07	88.91	92.87
SD	25.08	18.81	14.36	10.99	8.10
N	51	60	59	66	70

* Y2–3: Youngs PR; Y4–6 Cloze

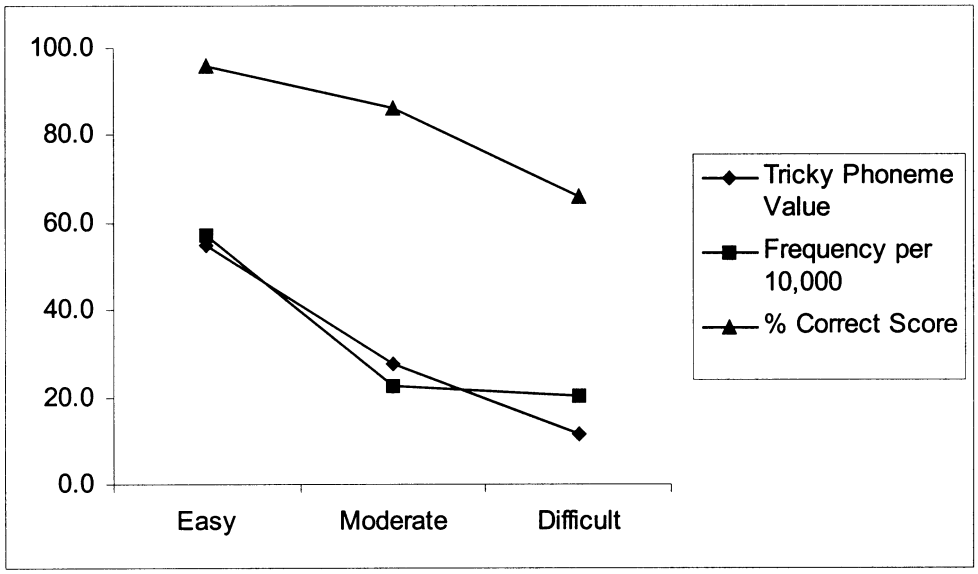

Figure 1a: Mean values (tricky phoneme, frequency and score) for word groups

explained 63% of the variability in the spelling of the 150 words throughout the school. The influence the word characteristics have on spelling is not equal: two were strong factors [phonetic difference and "tricky" phoneme value]; frequency and number of phonemes had 50% less influence on spelling difficulty.

The relative influence of the word characteristics on spelling difficulty can be seen in Figures 1a & 1b. Here the 150 words are divided into 3 groups on the basis of the number of children in the school (Y2–6) spelling the words correctly. The easy words (Table 1a) range from 90% to 100% correct spelling; moderate words from 80% to 89% (Table 1b); and difficult words from 34% to 80% (Table 1c).

Figure 1a illustrates how the mean scores, across the 5 school years, for the 3 groups of words, fall from 96% (easy) to 66% (difficult); the mean values for the strong "tricky" phoneme factor also fall, from 55% to 12%, as fewer pupils spell the words correctly. The means for the weaker word frequency factor also fall as spelling performance drops.

A similar perspective is presented in Figure 1b. As words become more difficult they tend to have more phonemes (from 2.6 to 3.2), but this small change reflects the weakness of the factor; the strong factor is the phonetic difference (PhD). The easy words tend to show one-to-one mapping, with few additional letters (PhD=0); the difficult words move away from the

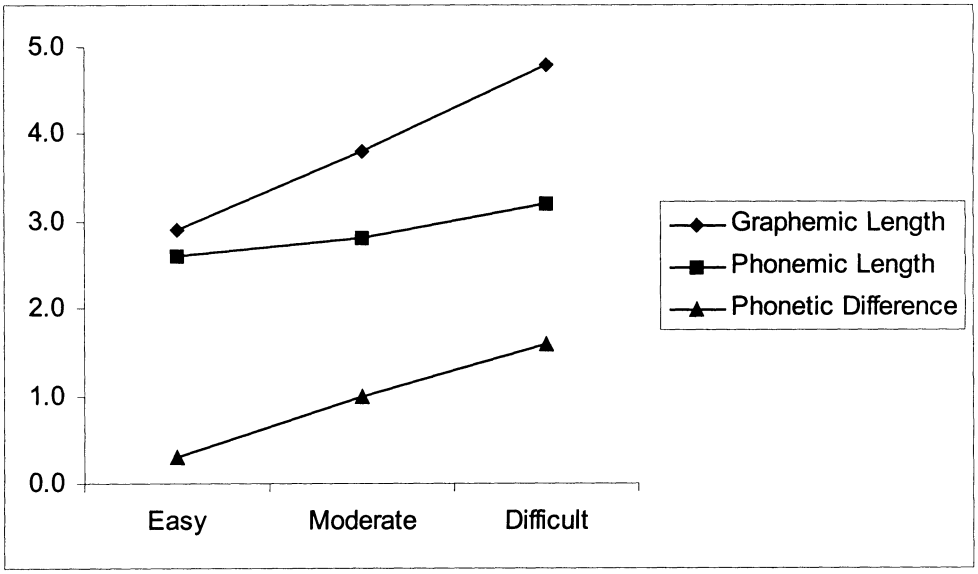

Figure 1b: Mean values (word length and phonetic difference) for word groups

alphabetic principle and tend to have two additional letters (PhD = 2; i.e. a three phoneme word would be represented by five letters, as the graphemic length illustrates).

The results also give an indication of the damage that the strong factors, which reflect the degree to which English words deviate from the alphabetic principle, do to less able children. Figure 2 presents scores for the least able children (25%) in each year. For this group of children there is a sharp contrast between the easy words, with 65% of children spelling them correctly, and the difficult words, with only 10% of the least able pupils spelling them correctly. Although this is not a longitudinal study it does illustrate how much extra time may be needed for spelling proficiency to be raised for the more difficult words. For example, after two further years of schooling the least able 9 year-olds (Y4) have only reached the same level of proficiency on the moderate words that the 7 year-olds had attained on the easy words. Further, after 3 extra years, the least able 10 year-olds are still having problems with the difficult words, and have still not reached the same level of proficiency that the 7 year-olds have reached for the easy words.

Spelling factors and reading difficulty

If the same underlying processes are involved in spelling and reading, the factors which control spelling difficulty should also influence reading difficulty. Preliminary results (Spencer and Xing, 2001) indicate that this is the case. Reading data for a class of 28 Y2 children in a similar Hull school were obtained and analysed with the same factors that were used in the spelling regression analysis. The results indicate that these four factors are all highly significant, but explain less of the variability in reading difficulty in the Y2 children (Y2 reading 42%; Y2 spelling 62%); however, another significant factor, the number of phonemes with phoneticity values less than 25% in a word, raises the power of the reading model (with 5 factors) to account for 50% of the variability. As with the spelling data the number of phonemes in a word and the frequency of the word were weak factors.

The results in an international perspective

The data from this and previous studies suggest that the make-up of English words, across a wide frequency range, contribute to spelling and reading difficulties for primary school pupils. Clearly, the suggestion is that English spelling hinders children's progress in spelling and reading, and the corollary is that reading and writing in other languages that are more regular will not be inhibited to the same extent.

When writing technologies are upgraded the effect on literacy can be quite profound. Turkish was written for a thousand years using the Arabic script, until the Latin alphabet was introduced in 1928. The national reform, which was completed in just 2 years, achieved nearly perfect one-to-one mapping of sounds and written symbols. After the reform it was claimed that children and adults learned to read and write fluently within a few months. Oney and Goldman (1984) confirmed the great advantage this form of orthography afforded over English. Working with American and Turkish first and third grade children they found that in reading tests Turkish first grade children outperformed their third grade American counterparts, and the difference was most apparent in longer words. They concluded that the regularity in letter-sound correspondence in the Turkish language seems to facilitate the acquisition of decoding skills and 'this is reflected in both speed and accuracy'.

Landerl et al (1997) found that reading times for English dyslexic children were double those for German dyslexic children, for three-syllable words and non-words. English children made three times as many errors when reading such words. They concluded that consistent orthographies, such as German, pose much less of a problem for readers than

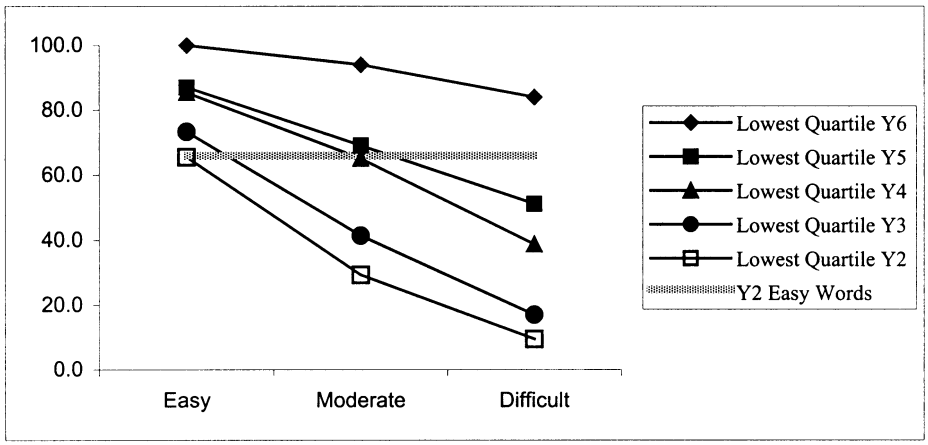

Figure 2: Lowest quartile scores (Y2–Y6) for word groups

inconsistent orthographies such as English, and that the differences in reading difficulties between English and German dyslexic children are due to differences in orthographic consistency. Indeed, the results demonstrated that for low frequency words German dyslexic children made fewer errors than normal English children of the same age.

Italian, another consistent orthography, also facilitates reading: the phoneme/grapheme ratio for English is 1:28, and compares unfavourably with 1:1.3 for Italian. Cossu et al (1995) found that young Italian readers achieved 92% accuracy on word reading tests after only 6 months schooling, whereas learning to read in English takes much longer. Paulesu et al (2000) confirmed the effects that irregular orthographies have on speed of processing. When controlling for reaction time, articulation speed, naming speed and verbal fluency, Italian students were faster at both word and non-word reading, even when non-words were derived from English. They found, using PET scans, that the pronunciation of a stimulus in English involves access to more regions of the brain than Italian and that this requires both time and resources. They conclude that 'reading in Italian can proceed more efficiently because of the consistent mapping between individual letter sounds and whole-word sound'.

Figure 3 illustrates the relative orthographic transparencies of Italian, German and English. The data is based on the 150 common words used in the spelling study, and equivalent words in Italian and German. The "tricky" value for words in the three languages, a key orthographic factor in spelling and reading, was calculated in relation to the spelling variability in the 150 words. Italian words are very consistent, with 80% in the easy category ("tricky" value 60–100%). This indicates why Italian children have so little difficulty in reading. German is not as consistent as Italian, but still has 60% of its words in this category, whereas for English only 30% of words can be classed in this way.

Discussion

The results of this research have implications for the teaching of literacy skills. They also confirm the probable outcome of employing a deficient technology, and actually raise the question: what is reading (and spelling)?

Deficient technologies waste time and energy, and that is precisely what is achieved in the English-speaking world. Figure 3 indicates that most pupils in the lowest ability group of year 2 (7 year-olds) can spell common words which conform to the alphabetic principle, but require an additional 3 years of schooling to reach the same level for the most difficult common words, which tend to deviate from the alphabetic principle. It appears that the consequence of using a very inconsistent orthography will inevitably be very high rates of illiteracy, as we find for English-speaking countries in international comparisons (OECD, 1995).

There is undoubted resistance to the idea of spelling reform in the UK, and a cynical point of view suggests that this reluctance reflects a desire to prevent a large sector of society from achieving its full potential. There was great concern in the UK during the 19th century that schooling might foment revolution, and that literacy was a very powerful political tool. An orthography which was not transparent would afford two advantages in a society divided by class: it would make the process of learning to read and write more difficult because it would necessitate code-breaking

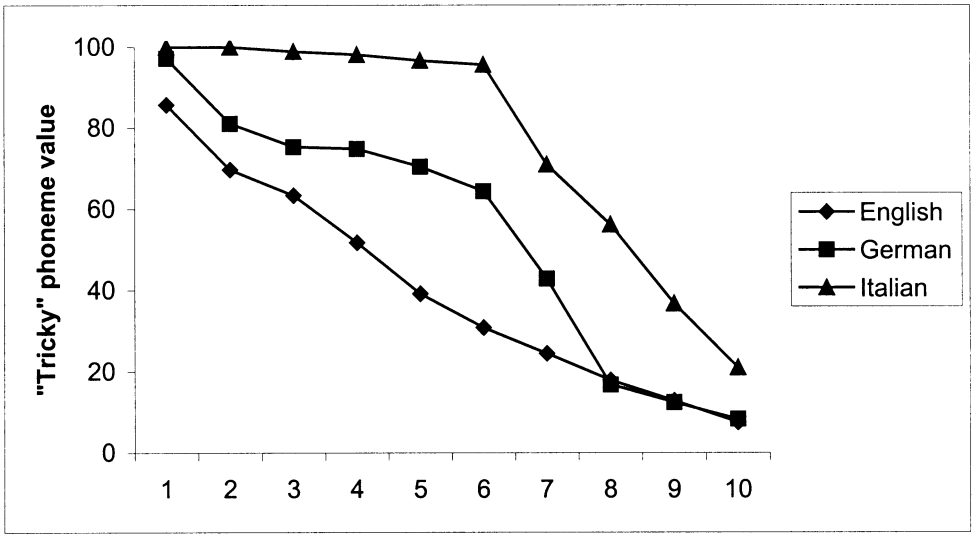

Figure 3: Mean "tricky" values for 150 words in English, German and Italian (in groups arranged from most [1] to least [10] phonetic)

skills and a knowledge of Latin and Greek; and it would reinforce a feeling of inadequacy and inferiority in individuals who had not the resources and time to master what should be an easy skill. The English script incorporates a social etiquette dimension to a much greater degree than most other alphabetic scripts, a device that was used to great effect in Richardson's 18th century novel 'Clarissa' (1751) in which the lower classes apply the rules to English words (especially doubling consonants) and are shown up for doing so. The aristocrats were word perfect and obviously familiar with the version of English which formed the basis for Johnson's dictionary (1755) which fixed English spelling for 250 years.

So, what is reading? Paulesu and his colleagues (2000) titled their paper "A cultural effect on brain function", indicating that what an Italian child does when looking at a page of written information is very different to what an English child is doing. The Italian child is reading; the English child is deciphering. Reading is easy and can be learned in a couple of months; deciphering a complex code requires much more time and energy.

When researchers study reading and writing, the word factors which control word difficulty must be taken into consideration. For example, controlling for word frequency in comparisons between English and German or Italian is not sufficient because English words may be infrequent but easy if they adhere to the alphabetic principle and vice versa (e.g. 'ban' and 'through'). In fact, perhaps research purporting to investigate reading or spelling should only be conducted in Italian or other transparent orthographies: deciphering and coding skills would be the exclusive preserve of English.

The results of this and previous studies also suggest that English must be seen as an exceptional variation on the alphabetic language theme. Sampson (1985) describes the English script as 'a compromise between the phonographic and logographic principles – somewhat akin, in fact, to Japanese script…' and this perspective indicates why there is a tension between methods for teaching spelling and reading of English. Phonic methods are clearly suited to transparent orthographies such as Turkish, Italian and German, but a language that also exhibits logographic tendencies will require more than a purely phonetic approach. Transparent orthographies are very efficient because they do not make heavy demands on memory; logographic scripts, such as Chinese, are much more memory dependent. The challenge for educators is to find a middle way, between the extremes of purely phonic or look-and-say methods, for teaching English literacy skills. Dombey (1999) reflects this when suggesting that 'a balanced approach to reading recognises and encourages a close relationship between grapho-phonic learning, whole word learning and the experience of texts.'

The essential problem for early readers of English is the lack of self-teaching opportunities that push words into the lexical store which aids automaticity in reading (Share, 1995). In essence, most regular orthographies require a shorter period of rule learning than English and empower their pupils, enabling them to decode new words, even non-words, from an early age (Thorstad, 1991). This ability affords the opportunity for words to be assimilated quickly into the lexical system (Coltheart et al, 1993) leading to faster, expert reading, so essential for reading for meaning. Children working with transparent orthographies will be performing this action, with new words, as they apply the relatively straight-forward recoding rules. This means that in a shallow language as a child encounters a new word, which is not sufficiently embedded for the lexical system to evoke an immediate response, the easy decoding afforded by the orthography enables the link between text and word to build up a stronger representation, making it more likely to evoke an immediate response when next encountered. Such is not the case for English pupils. Even for the most common words in the language, which represent 50% of what we read, most have a difficult, low probability, grapheme. Because these words cannot be decoded by the pupil's application of simple rules they must be learned by association. For this to occur an external agency (such as a teacher, parent or paired-reader) must decode the word for the child, and this slows the rate at which children build up their lexical store. Without an external source being present to recode difficult words many children will be prevented from making progress if a text contains too many unfamiliar items. This is not the case for a child working with a shallow language: the meaning of unfamiliar items is simply unlocked by applying the rules that are usually learnt in a couple of months.

However, if self-teaching is not readily available because of the form of orthographic encoding, how can the lexical store be enlarged for children who are failing? The answer seems to be intensive one-to-one teaching. This appears to be the common feature of most methods which claim success at remediation, such as Clay's (1979) reading recovery, or the reading reflex method of McGuinness (1998). Torgesen (2001) has recently presented an interesting perspective on this when comparing two instructional programmes, both involving explicit instruction in phonemic decoding skills, stimulation of phonemic awareness, building a sight word vocabulary of high frequency words, and applications of these skills to reading and understanding text. The interventions lasted eight weeks, and consisted of two 50 minute one-to-one sessions per day, five days per week. However, their instructional strategies were very different. One programme worked intensively to build strong phonemic awareness and a large amount of time (85%) was devoted to teaching children to accurately identify the number, order, and identity of sounds in words. In

contrast the other method spent most of the time on reading connected text (50%), with the teacher providing careful error correction and discussion to help children generalise effective decoding strategies. Both methods afforded opportunities for guided practice of new skills, with very intensive instruction which provided systematic cueing of appropriate strategies in reading words or text, and explicit instruction in phonemic decoding. When rate of reading growth was compared both instructional strategies showed very similar benefits, removing about 40% of the children from special education in the year immediately following the 8 week intervention. These very different methods produced substantially the same results, and the probable causal factor was the intensive sessions with an expert decoder. A rough estimate suggests that one teacher could help 6 failing pupils per term.

This seems to be the price that has to be paid for our out-moded writing technology. The exact method of teaching may not be as important as the costly provision of individual or very small group tuition. If children fail to develop adequate decoding strategies early in their school life then intensive one-to-one teaching may be the only effective way of raising their literacy skills to the level at which they can begin to self-teach.

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