The Importance of Phonological Processing for Reading Comprehension: Why Reading-while-Listening should Precede Silent Reading

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Abstract

Phonological awareness underpins reading comprehension. It is recommended that English learners attain phonological awareness before reading instruction begins, and that once learners start to read, they be provided with the opportunity to simultaneously listen to the text. Nevertheless, English learners undertake silent reading without the necessary foundation of phonological awareness. This is suggested by the nature of their spelling errors, because spelling errors reveal phonological assumptions. First, I compare the spelling errors of L1 English-speaking children, L1 English speaking teenagers and adults, and L2 English learners in Japan. This comparison reveals that the first two groups tend to make errors based on phonology, whereas the latter make errors which cannot be interpreted in terms of English phonology. This suggests that many English learners have not developed sufficient phonological awareness. Next I present ways to foster phonological awareness as a foundation for reading comprehension.

The important role of phonology and in the acquisition of second language reading skills identified by Walter (2008) has not been widely acknowledged in current pedagogy. Silent reading is commonly practiced, but in this article I argue in favour of preceding the practice of silent reading with promoting phonological awareness and extensive reading-while-listening.

Various studies identify the foundation to reading provided by phonological awareness; "phonological processing is a sine qua non of successful literacy development" (Goetry et al. 2009, p. 169). In the case of learning to read L1 English, the link between learning to read and phonology is causal (Bradley and Bryans, 1983, p. 421). Walter (2008) distinguishes between

the way written words are decoded and stored; decoding occurs visually and storage phonologically. Readers of alphabetical languages retain the last two seconds of what they have read in the phonological loop (p. 457). While reading, rather than storing the words just read visually, they store them aurally (p. 458).

I argue that many Japanese learners have not established the necessarily phonological awareness for learning to read English, and that teachers of reading need to foster it. Japanese has relatively few phonemes (Tokuhama-Espinosa, 2008), and therefore the development of phonological awareness by Japanese learners of English is complex. Sekiyama and Burnham (2008) compared the integration of audiovisual elements of speech perception of native Japanese and English speakers, and discovered that the English speakers relied more on visual cues for speech perception than the Japanese speakers, because of the greater phonological complexity of English. English has many more vowels- at least fourteen, whereas Japanese has five. Also, English has a higher frequency of consonant contrasts.

Evidence of phonological perception may in some instances be revealed by misspellings. First I will compare and contrast misspellings by L1 English speaking-children, by L1 English-speaking, teenagers and adults, and by English learners in Japan.

Invented Spellings

Crystal (1988) explains how children's early attempts at spelling are based on sound rather than the shape of the word:

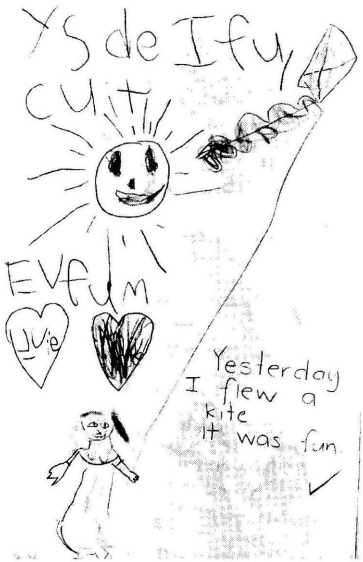
> The study of the errors children make when they are learning to spell (errors like our for hour, or sed for said) shows that spelling is not just a visual matter, but a matter of relating letters to sounds. The children spell the word as they hear it in their heads . . . We don't learn to spell by studying the 'shape' of the word, and remembering that. Children who try to spell by learning visual shapes soon get into deep water (1988, p. 75).

Before English-speaking children have mastered spelling they sometimes invent their own spellings. According to Trieman (2017) invented spellings "seem to have been constructed by children rather than retrieved from a memorized store of whole-word spellings" (p. 268). Examples of invented spellings of children learning English as an L1 are 'brockeley' (broccoli)

(Rowe & Edwards, 2001) 'Yere' (Year), 'skeairing' (scaring), 'mows' (mouse) (Clarke, 2004). Furthermore, according to Ouellette & Senechal (2008),

> invented spelling may indeed help children analyze oral language into phonemes, but, very importantly, it provides an exploratory learning experience that may also promote the integration of phonological and alphabetic information into initial lexical representations. As these lexical representations become refined, they may facilitate the acquisition of reading (p. 900).

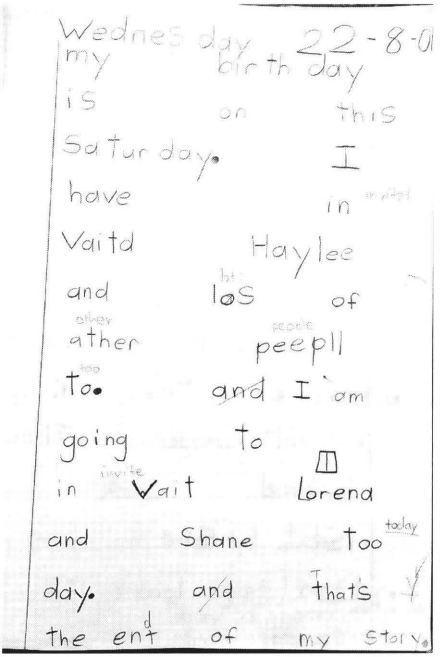
Importantly, Ouellette & Senechal (2008) explain that invented spellings are not the result of memorization and recall, but are rather exhibit developmental progression in phonological and orthographic accuracy. An example of invented spelling in a story by a five year old English speaking child appears below:



The teacher has confirmed the intended meaning with the child and written the standard version underneath: 'Yesterday I flew a kite. It was fun.' Without having being able to interview the child, it can be speculated that she has represented the phonologically salient orthographic features here: ysde (yesterday), I (I), fu (flew), cuit (kite), E (it), v (was), fum (fun). This

example suggests a developing phonological awareness which informed her early attempts at spelling.

The following is a later composition provided by the same child, still aged five.



"My birthday is on this Saturday. I have in vaitd (invited) Haylee and los (lots) of ather (other) peepll (people) to (too) and I am going to in vait (invite) Lorena and Shane too day (today) and that's the ent (end) of my story."

All of the misspellings here reveal phonological assumptions as the child attempts to match graphemes to phonemes. For example, *in vaitd* is a reasonable phonological representation of *invited*; the error is in identifying the word boundary. Next, *los* for *lots* suggests that the pentultimate consonant /t/ is not phonologically salient for the child. The invented spellings *other* as *ather*, and *people* as *peeple*, *today* as *too day* and *ent* as *end* can be clearly explained in terms of the child's phonological perceptions.

Misspellings by L1 English-speaking teenagers and adults

Next, I will present misspellings made by L1 English speaking teenagers and English learners which, similarly to the invented spellings of young children, hint at how they are processed phonologically. One mistake commonly made by English speakers, which I cannot help noticing, is the spelling of my name. The correct spelling is *Stephens*, but some editors write it as *Stevens*. The reason this spelling mistake is made is that after processing it visually the reader stores it aurally, and reproduces an alternative spelling based on the sound that has been stored phonologically. Stephens and Leane (2013) collected misspellings by L1 English speakers (including the first author) which reveal the writers' phonological perceptions, such as the following: unfogivable (unforgivable) flaw boards (floorboards) (17 yrs) sratched (scratched) (17 yrs) this courses (causes) (17yrs) bustop (bus stop) (adult, when typing) pritty (pretty) (16 yrs) ribon (ribbon) (16 yrs) waste (waist) (16 yrs) therefor (therefore) (18 yrs) cords (chords) (18 yrs) fouth (fourth) (76 yrs). These misspellings indicate the aural storage in the writer's inner speech. These examples were taken from speakers of Australian English where the 'r' is not pronounced unless is appears at the beginning of a word, in a consonant cluster, or links to a following vowel. The examples of the missing 'r' from the spelling of unfogivable (unforgivable), flaw boards (floorboards), therefor (therefore), cords (chords), fouth (fourth) reflect their phonological assumptions.

Misspellings by Learners of English

Now I will present misspellings by Japanese learners of English (Stephens and Leane, 2013). The following errors diverge from most errors made by English speakers in that they do not reflect phonological perceptions.

longgest (longest) Freign Lecturers (Foreign Lecturers) wath (watch) Japaese (Japanese) Englih (English) Eglish (English) brought (drought) fruite (fruit) quie (quite) slove (solve) bolow (blown) Japasene (Japanese) bucause (because) shaper (sharper) Fistly (Firstly) Furtherore (Furthermore) Howerver (However) pinkiller (painkiller) attened (attended) naver (never) January 31th (31st) sudents (students) dengerous (dangerous) contines (continues) Rosia (Russia)

Implications for Silent Reading

The review of misspellings by English speaking children, adults, and learners of English reveal differing tendencies of misspellings, which suggest differences in phonological awareness. These differences in phonological awareness have implications for L2 English pedagogy. Silent reading is currently widespread practice in L2 English language classrooms. It is not my intention here to draw attention to specific cases, but rather to call for a heightened awareness of the role of phonological awareness in learning to read, and to suggest how this might be cultivated. I recommend the following three steps:

(1) Cultivating phonological awareness independently of reading comprehension
(2) Implementing Reading-while-listening rather than Silent Reading
(3) The teacher reading stories aloud to the class as the class follows along as they silently read the same text.

(1) Cultivating phonological awareness independently of reading comprehension

Phonological awareness should be cultivated prior to the teaching of reading in order to circumvent mispronunciations induced by the irregular spelling of English, and the opaque nature of English orthography. The pronunciation of individual words changes in the stream of speech according to the articulation of the previous and following words. These changes are not apparent in the spelling, and speakers tend to be unaware of them (Dehaene, 2009). The act of silent reading in L2 English will not sensitize the readers to the ways in which the pronunciation of words changes according to the contextual sounds. A further reason for cultivating phonological awareness before teaching reading is the presence of prosody in the spoken language but not the written language. Competent readers superimpose prosody onto the written word as they read. Prosody is important because of the intertwining of grammar and intonation. Halliday and Greaves (2008) explain how intonation overlaps with the grammar: "A stretch of language that we recognize on phonetic/phonological grounds as a tone unit will be (the realization of) an information unit in the grammar; and this, in turn, will have the same extent as a grammatical clause" (p. 59). Accordingly, intonation reinforces grammatical boundaries, and therefore contributes richly to comprehension. English learners benefit from learning how to superimpose prosodic contours onto written text when reading.

The sequence of acquiring phonological awareness before learning to read is acknowledged by many scholars, such as Koda: "in all languages, reading builds on oral language competence" (2007, p. 1). Eastman (1991, cited in Vandergrift & Goh, 2009) considers that the teaching of reading should be delayed until learners are familiar with "the cognitive processes that underlie real life listening" (p. 403). Masuhara recommends the skills acquired by L1 readers also be extended to L2 learners: "The question is whether L2 learners, even at an advanced level, possess the kind of auditory images similar to those of L1 skilled readers? If not, the reading pedagogy has to provide such intervention." (2007, p. 28). The auditory images that L1 readers of English possess are connected to working memory, which is used in reading. These auditory images are first converted from the visual image of the written word, and are converted to sound and then stored in the phonological loop (see Walter, 2008). They inform understanding of what has just been read, and help the reader make intelligent predictions about what is to come. Masuhara's (2007) observation indicates that she doubts that L2 readers necessarily possess the auditory images which are invoked during reading. Phonological awareness needs to be adequately cultivated before reading instruction so that this awareness can be exploited when reading.

(2) Implementing Reading-while-listening rather than Silent Reading

As argued above, phonological awareness must develop before reading instruction. However phonological awareness of a dissimilar language requires extensive exposure. Japanese learners require exposure to many more phonemes than are available to them in their own language in order to develop phonological awareness. This awareness tends not to be adequately established before they start reading. To compensate for this, reading-while-listening, rather than silent reading, is recommended. Reading-while-listening will help the learner understand the connection between the visual symbols on the page and the actual sounds that they represent. The written word only partially reflects the sound of the text being read. Written English is a poor guide to pronunciation for learners of English. Nor does written English indicate the rhythm, stress or intonation. Furthermore, reading-while-listening confers the benefits of bimodal input. Cheetham (2017) has recommended bi- or multi-modal input rather than mono-modal input be standard practice. Delivering the text in two modalities provides this important scaffolding for the learner.

A further benefit of reading-while-listening is that it provides essential prosodic information that is not apparent from the written word. Wells (2006) explains how the grammar maps onto intonation by highlighting the beginnings and endings of phrases and sentences. Spoken language is segmented into units of meaning that are reinforced by particular intonation. For example, if a telephone number is spoken with a flat intonation it is difficult to recall, but if it is spoken with a normal intonation it is relatively easy to recall. The intonation reinforces working memory (Crystal, 2016), which is critical in comprehension. Therefore the bootstrapping provided by reading-while-listening enhances reading comprehension by learners.

(3) The teacher reading stories aloud to the class as the class follows along as they silently read the same text.

Reading-while-listening can not only be practised using audio-recordings, but also practised live in the classroom. The advantages of a live delivery is that the teacher is able to adjust her delivery according to the comprehension of the class members (Stephens, Kurihara, Kamata, & Nakashima, 2018), and this delivery can be fine-tuned to the needs of the students. Students report feeling more motivated to concentrate and participate because of the human qualities delivered in a live reading such as warmth. In their comparison of live and audio delivery of reading-while-listening, "students provided a myriad of reasons why they preferred the live reading, such as mouth movements, facial expressions, warmth, kindness, and improved concentration" (p.111).

Conclusion

A comparison of misspellings between L1 English-speaking children, L1 English-speaking teenagers and adults, and Japanese learners of English, suggest differences in phonological awareness in writing, namely, a relative lack of phonological awareness by the latter. Given the connection between phonological awareness and learning to read, it is recommended that a much greater emphasis on phonological awareness be developed for Japanese learners of English. Before learners embark on their study of written English they should become familiar with the sounds of spoken English through extensively listening to songs, rhymes, and stories. Once they embark on the study of written English, they should not immediately commence silent reading. Silent reading should be delayed until the learners have attained the auditory

imagery identified by Masuhara (2007). If learners begin silent reading too early, they may either impose katakana phonology on the written word, or decode the written symbols into Japanese. Japanese and English have mirror word orders (Neustupny, 1987; Pinker, 2002), so decoding written English into Japanese is a laborious and inefficient process. The decoding approach to reading has not resulted in fluent reading, nor can decoding skills be transferred to authentic communication in English. Accordingly, establishing a foundation of phonological awareness before commencing reading instruction offers a superior pedagogical direction. When reading instruction is introduced, it should be supplemented with the auditory modality available in reading-while-listening. Only after these two steps have been implemented, and when students have achieved sufficient auditory imagery of English, should silent reading be introduced.

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