Emerging reading ability: interplay between theory and research

Of the many burdens of modern education around the world, literacy ranks amongst top priorities. Swiftly, the pedagogical focus has translated into a social agenda in the research field, motivating both theoretical and empirical efforts that inspire and propagate one another.

It is clear that becoming a reader is a developmental process; thus, researchers have long attempted to define stages of children's progress in reading (e.g. Frith, 1985). One proposal that has been frequently cited is one by Ehri (1995), which argues for four stages of development. From one stage to the next, alphabetical processing becomes more and more sophisticated. This paper will focus on the very beginning: how do children first break into reading single words? What are the cognitive change processes?

The suggestion by Ehri and Wilce (1985) was that first readers underwent a shift in how they processed words, from being based on visual cues to a reliance on phonetic ones. That is, children shifted from making connections between salient visual features of a word and its pronunciation or meaning, to storing associations between letters and sounds. But theories disagreed on why this shift happened, when it happened, and how it came about.

For Gough and Hillinger (1980), this shift did not happen until the sight-word learning system broke down from having exhausted the pool of visual features available for distinguishing among words. About 40 words were purported to be learnt this way, before the more productive letter-sound system kicked in. Another view (Ehri and Wilce, 1985) claimed that even for the very first words, young readers started to process letter-sound relations with partial knowledge complemented by memory-based compensatory processes.

The fundamental debate concerned the child's orienting approach to the printed form, namely, whether one is logographic or analytical with respect to perceiving word *form*. Crucially, both sides are in agreement that children treated words as a holistic picture-like symbol (not unlike a commercial logo) *before they actually knew a single word*. Once first words are learnt, researchers argue over the time-course and process of how children gain the insight to use letter-

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sound relations for a more productive word decoding system. Solving this question has far-ranging implications: How might behavior so early in development dictate the way that phonics and whole language foci should be balanced in instruction (Adams et al., 1998)? Are there universal initial biases for acquired skills like reading? Can reading-specific skills and language-specific propensities be scaffolded by culture prior to print exposure?

Multiple lines of research have ensued to shape the field's *own* orienting approach to emergent reading. To begin with, studies have looked at children's first interactions with letters and sounds, and how prereaders transition into recognizing words.

Even prior to formal education, children gain exposure to the alphabet in their home environments. Several studies have explored the nature of alphabetic knowledge in prereaders—those who cannot read more than one word. A classic paradigm (Ehri & Wilce, 1985) was a training task in which children were taught and tested on reading two types of simplified spellings: phonetic (SZRS for *scissors*) and visual (qDJ^{k} for *scissors*). Findings in both English- and Brazilian-speaking populations showed the same effect, that prereaders who had not mastered the alphabet learned to read visual spellings more easily than phonetic spellings, whereas those who knew most of the letter names found it easier to learn phonetic spellings than visual ones (Scott & Ehri, 1990; Cardoso-Martins et al., 2002). Thus, alphabet knowledge appears conducive to sensitivity toward letter-phoneme relations and their functions, even in children who could not yet read. A follow-up question might be to ask: what is it in alphabetic knowledge that promotes this phonological awareness? Each letter contains orthography, a name, and a symbolized sound. Which one of these elements, or their interaction, is responsible?

McBride-Chang (1999) explored, over 15 months, development of alphabet knowledge in children who began as prereaders. What she found was confirmation that letter-name and letter-sound knowledge contributed unique variance in predicting later reading-related skills. Also, letter-name knowledge developmentally preceded that of letter-sounds. Therefore, the two appeared to represent rather different constructs.

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Evidence such as the above has, over the years, corroborated more strongly the theory by Ehri and Wilce (1985). The shift from being based on visual cues (of the word) to attending to the productive relations between letter and sound comes early. Even in the earliest stages of reading one word or none, children are analytic learners, using what they know about names and sounds of letters (McBride-Chang & Treiman, 2003). The foundations of phonological awareness are being constructed as a child enlarges his or her alphabetic repertoire. Such empirical progress caused research questions to also move forward. For example, this theory does not provide as satisfying a 'why'-story as the capacity-based one offered by Gough & Hillinger (1980). Why is there the intrinsic motivation to be analytic? Another pertinent question might be: since alphabetic knowledge is so important, what are the factors that affect its development?

Recent years have seen interesting work in response to the latter question. For example, letter sounds with a consonant-vowel structure (e.g. B, D, but not L) are found to be easier to learn in general (Treiman et al., 1994). A possible reason is that for these letters, the letter sound tends to mark the beginning of the letter name (e.g. /b/ is at the beginning of B, but /l/ is at the end of L). Another factor related to the alphabet system itself is that both letter-name and letter-sound identification were found to correlate with where the letter exists in alphabetical order (McBride-Chang & Treiman, 1999). This is likely to be explained by primacy and frequency effects. As with numbers, the items at the beginning of a much-recited list should be salient in the first place, and with the repetition, be more prominent in memory.

Two factors relate to the actual word experience of the child. In any given context, a letter at the word-initial position is a more useful cue than the final letter on reading performance (Bowman & Treiman, 2002). This finding refined a previous hypothesis that predicted both boundary letters to share equally important roles of anchoring the reader's first attention. Thus, repeated exposure to a variety of letters at the word-initial position will multiply opportunities for practicing and learning letter-sound relations. Finally, a child's own name has been found influential in both development and use of alphabetic knowledge. By the time a child gets ready

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to start reading, he would have heard countless instances of his own name, and seen hundreds of the printed form. Thus, it is intriguing yet not entirely surprising that what a name is made of would pose an effect on reading and writing performance. For example, the initial letter of one's first name boosts the accuracy of naming that particular letter, but not of sounding it (Treiman & Broderick, 1998). When writing in lowercase, children reverted to uppercase in the middle of a word, when the letter happens to be the initial letter of their first names (Treiman & Kessler, 2004). Furthermore, children (who read below the first grade level) with longer first names, tended to produce longer spellings than their peers with shorter names, and these spellings also contained a lower proportion of phonetically reasonable letters than the spellings of their peers (Treiman, Kessler, & Bourassa, 2001). In summary, emergent readers' knowledge of letter sounds depends on its *transparency/salience* within its corresponding letter name (e.g. /p/ in P), whereas knowledge of letter name heavily relies on *familiarity/frequency* factors.

Zooming in on a small but significant area within the vast reading literature, one can again witness how a core theoretical debate triggered not only research that directly addressed the initial question, but also a logical series of questions that challenged us to look, in more detail, into what alphabet knowledge entails. Meanwhile, one does not need reminding that this is far from the whole story of how children decode their first printed words. Only via looking across languages (especially with non-alphabetic ones like Chinese, one would expect a much longer logographic phase), into multilingualism (one or many systems?), and at atypical populations (how do deaf children learn to process and read an alphabetic script?) will the field arrive at a robust picture of this developmental phenomenon.

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