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What remains from the determinants in learning to read?

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In this paper, Kolinski and Morais revisit decades of research conducted in illiterate people. The main contribution, and this is the purpose of the paper, is to show that having learned to read -being literate- shapes cognition, as for example oral language and reasoning. Therefore, these theoretical fields should take this evidence into account. In the present comment, I would like to revisit the impact of considering consequences of literacy in the field of learning to read.

1. The relevance of the method to identify determinants of reading achievement

On the relevance of developing appropriate methods to identify reading determinants
The contribution of the Brussels team, Morais, Kolinski and colleagues, can be situated at two levels: methodology and theory. It is important to underline the methodological impact their research had. Numerous children do encounter difficulties in learning to read, and even fail to read adequately. If failure to read is to be reduced, we need to identify determinants of reading achievement - and of failure to read - in order to conduct targeted interventions of these determinant factors. Teachers and school psychologists aim at identifying these determinants or, even prerequisites of reading achievement. For example, some decades ago, skills like left-right lateralization were considered as prerequisites as, in order to distinguish the letter b from the letter d, one must process the orientation of the figure. Kolinski (DATE)'s work on orientation was critical for this purpose. They showed that illiterate people -who never learned to read- did not consider as different two figures which differed only by left-right orientation, whereas ex-illiterate people, having learned to read in adulthood, considered them as different. Therefore, they pointed to the necessity of considering two directions in causality: if reading failure can be explained by causes, having learned to read, i.e. being literate, has consequences on several aspects of the cognition. Therefore, before considering that some specific skill could be a cause of reading disability, one should also consider the possibility that reading has indeed developed this skill. Comparing the performance of disabled readers to that of normal readers could therefore be tantamount to

listing consequences of literacy rather than identifying causes of difficulties. Therefore, the careful analysis of reciprocal influences in learning to read has become essential.

It is interesting to note that it is in the field of phonological skills that the analysis has been conducted the farthest and this is a strong theoretical contribution. Even though first accounts of dyslexia focused on visual processing skills, the issue of phonological skills was at the heart of the debates on reading achievement and reading disabilities, when cognitive psychology started to investigate this field, in the 80s. The reason lies in the alphabetical system. To be able to understand the alphabetical principle, children must be able to identify and isolate, in speech, a unit that is represented in writing. As Kolinski and Morais remind us, this unit is never pronounced in isolation. This is precisely because children have to learn an alphabet that they can access phonemes. Therefore, if phonological skills are strong determinants of reading achievement, one should clearly distinguish the abilities which might have a causal connection to reading and those which are consequences of knowing the alphabet. In other words, the contribution to reading of phonological skills that arise from phonemic sensitivity or syllabic analysis, are quite distinct from phonemic analysis skills, whose development depends on reading (CASTLES). This raises two questions. First, does phonological awareness, in a broader sense, remain a determinant of reading achievement? Second, what is the precise disturbance that affects dyslexic readers, who experience persistent difficulties in phonemic segmentation, while this skill should be developed by confrontation with the alphabet and given that they are able to segment syllables and know correspondences between graphemes and phonemes? Considering the first question, it is widely recognized that some phonological skills are causally related to reading achievement, even though the link between reading and phonemic awareness is stronger (). However, it became clear that children who are resistant to intensive intervention performed phonological tasks at the lowest level (the dyslexic children).

2. The issue of wearing dyslexia glasses when considering reading disabilities

Considering the second question, several authors have tried to elucidate this point (REF), and it is clear that, even though some questions remain, considerable developments have been reached in adopting the view of reciprocal influences. Regrettably, the proponents of other suggested causes of dyslexia did not conduct such a detailed analysis. For example, examining how reading shapes visuo-attentional span would certainly be useful for identifying what precisely causes reading disturbances in this domain. It is noteworthy that

some recent studies point out how the transparency of grapheme/phoneme correspondences directly impacts the extent of the visuo-attentional span (Lallier, Carreiras). Therefore, when they read in Basque, bilingual children display a VAS of about 4.5 letters while it is estimated to be 4.1 letters when the same children read in Spanish. These studies show that reading also shapes what is thought to be a cause of dyslexia. These studies are therefore also able to shed light on the reciprocal influences between reading acquisition and related skills, and consequently, to better understand what the precise disturbance is in reading impairment. Disentangling the causes and consequences also makes it possible to take preventive measures that are targeted to preventing reading failure *before* learning to read. However, in this area, we have to broaden our approach. The causal analysis in learning to read has mostly, but not exclusively, been conducted in reference to *specific* reading disabilities, i.e. dyslexia. The reason is methodological: in order to identify factors that are specifically related to reading, research has focused on deficits related to *specific* reading impairment. Numerous intervention programs are based on these analyses. However, specific reading disabilities such as dyslexia are not the only type of reading failure. Most poor readers are not dyslexics. Their profile was qualified in the 80s as « garden-variety »: often coming from a low socio-economic background, sometimes bilingual, sometimes with a border limit IQ. The debates on dyslexia have led researchers to leave out these children who, as poor readers, probably become semi-literate adults. Why do these children fail to attain some basic skills in reading? There is no comprehensive view at present. Scores obtained by these children often place them systematically as below average readers and even dyslexic readers. However, some studies have indicated that at least some of them respond positively to early intensive stimulation. For example, the studies conducted by Torgesen showed that some children needed more intensive training. Vellutino and colleagues also conducted early intervention studies and found children who responded positively to the intervention while others did not. Children who responded positively had lower performance in semantics, while those who responded negatively displayed poor phonological skills. Thus, these studies showed how phonological skills constitute a powerful determinant of reading achievement and allowed the identification of children at risk of dyslexia. However, as previously mentioned, not all reading difficulties are dyslexia. Poor readers display other difficulties. To what extent these deficits are the consequence of poor exposure to reading, and is it possible to identify early determinants of these non-specific difficulties?

It is likely that there are several determinants, including vocabulary.

3. Vocabulary and socio-economical level.

In the visual word recognition models, both decoding skills and word knowledge play a role. When reading is unexperimented, phonological decoding plays an important role in word reading. When the grapheme to phoneme correspondences are irregular, as is the case in English, vocabulary has to be activated in order to recognize words. Thus, regression analyses show that vocabulary scores account for a unique part of the variance for irregular words but not for regular ones. However, the contribution of vocabulary is not limited to irregular word recognition but also to comprehension. Here again, the relationship is reciprocal as reading activity provides as many opportunities to learn new words ((e.g., Beck, Perfetti, & McKeown, 1982). Consistent with this, children with poor reading comprehension tend to show relatively low levels of vocabulary knowledge (Nation, Clarke, Marshall, & Durand, 2004) and they are poor at using textual support to infer the meanings of new words (Cain, Oakhill, & Lemmon, 2004). Here again, the issue of reciprocal causality is critical: reading certainly develops vocabulary and, the more fluent the reading, the greater the exposure to words. However, can we consider that vocabulary is not a determinant of literacy? If we consider dyslexia, it is likely that the answer is no, because there is no vocabulary alteration in dyslexia (Cavalli,). Moreover, when we consider resistance to treatment as a sign of a specific risk of reading disability, vocabulary is not a critical factor. However, there are large differences in vocabulary in children, especially according to their socio-economic status.

(REF). **TRADUCTION: Cependant, il y a de fortes différences dans le niveau de vocabulaire des enfants, en particulier en fonction du niveau socio-économique.**

Let's imagine what happens when a child masters most of the alphabetical principle and is able to decode most of the words he/she is supposed to read, but he/she does not know their meaning. Of course, it is possible to infer the meaning of the word thanks to the context. Nagy and X (DATE) have shown that a child is able to learn about X words each day. However, the proportion of already known words to conduct inference should be sufficient. It is easily understandable that one cannot infer the meaning of the new word in the same way, and therefore memorize it, if the word is inserted in a passage where 95% of the words are known vs 70%. It has indeed been shown that the ability to infer the meaning of a word depends on the quantity of known words (REF). Thus, if reading promotes vocabulary development, a too small vocabulary prevents children from inferring the meaning of words. Here we have general issues and not specific determinants of reading. However, it would be useful to

consider these determinants, especially since a growing number of studies show that it is possible to set up efficient interventions in vocabulary development in low SES children (Kieffer). These preventive actions are important if reading disabilities and ultimately semi-literacy are to be reduced significantly .

Conclusion

The analysis of the consequences of learning to read on the development of cognitive and linguistic skills has proved decisive and has shed considerable light on the contribution of literacy. However, this analysis should not mask the fact that not all children are equal when face with the task of acquisition. Furthermore, the focus on specific reading disabilities led to a relative neglect of other cognitive and linguistic dimensions which might play a role in learning to read. Among them, vocabulary typically represents a potentially important determinant of reading which could be the subject of early interventions, allowing children to have access to the written word. In my view, this is a direction which could be taken in the future in order to have a strong impact on professional practice.