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The wide-open doors to lexical access

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Reading is an ability that appears simple and automatic to the experienced reader, in the same way that driving a car holds no mysteries for the practiced driver. However, most drivers would recall that the number of operations which needed to be learned to move the car smoothly seemed insurmountable during the first days of driving instruction. Nonetheless, as time passed by, thanks to repetition and practicing, and to the operations progressively becoming automatized, driving was no longer a challenge. Considering that in modern societies reading is typically acquired during early childhood, it is relatively implausible that we remember the hard moments we went through on the road to becoming fluent readers. Still, as is the case with driving, reading requires a substantial number of perceptual, attentional and mnemonic abilities, and a vast array of operations that can appear overwhelming to the neophyte until they become automatized.

Reading requires complex abstraction of the highly variable alphabetic visual input, which ultimately allows the access to the abstract orthographic categories that are in turn the door to the retrieval of phonological, morphological, lexical and semantic representations. This stimulus-to-meaning mapping has to be robust enough to face font variability, handwriting styles, orthographic errors, contractions and many other potential alterations in the input. This mapping poses the first paradoxical conundrum for the reader, who on the one hand has to be relatively “blind” to the obvious perceptual differences between multiple fonts, cases or handwriting of the same word (e.g., door, dOoR), and on the other hand needs to be “sighted” enough to detect basic

1 perceptual differences between a given word and other similar items (e.g., door, deer,
2 odor, dear).

3 The time window in which a given letter string passes from being a mere
4 sequence of printed curves and strokes to acquiring the word status takes around one
5 third of a second. In that fraction of a second the expert reader manages to access the
6 meaning represented by the written symbolic and arbitrary graphic patterns. This
7 phenomenon represents a model of human abstract symbolic thinking, since there is no
8 direct relation between the meaning of a word and its written form. If we consider the
9 concepts of a *door* and a *window*, it seems relatively straightforward to define the
10 semantic relation between them. However, from a linguistic perspective there is no
11 physical or functional relation between the two written codes *door* and *window*. How is
12 it then possible that readers are able to compute the semantic relation between these two
13 written codes through a simple eye fixation of 250 milliseconds? What does reading
14 imply for the human brain? And where and when in the brain does reading take place?

15 The answers to these questions are still controversial. Nonetheless, in recent
16 years the neurocognitive literature has provided the grounds for constructing the perfect
17 test scenario to help solve this issue. What, where and when? Neuroimaging and
18 behavioral methods have demonstrated that reading implies a complex pattern of feed-
19 forward and feedback interactive activations flowing along the visual recognition
20 system, mainly in ventral regions of the left temporal lobe. Still, the precise way in
21 which all the intermediate representations between a physically concrete printed
22 stimulus and the mentally stored abstract lexico-semantic representation are activated is
23 still debated and needs to be further explored.

1 The present Research Topic aimed to create a landmark forum in which experts
2 in the field define the state of the art and future directions. A total of 10 excellent
3 articles have been compiled (6 Original Research articles, 3 Review articles and 1
4 General Commentary). Su, Mak, Cheung and Law open the section of Original
5 Research articles with an experiment using ERPs to test the interactions between
6 graphemic similarity, position of the radicals of Chinese characters and lexical access.
7 Next, Sliwinska, Khadilkar, Campbell-Ratcliffe, Quevenco and Devlin present the
8 readership with a study using chronometric TMS devoted to better characterizing the
9 role of the supramarginal gyrus in phonological processing, and ultimately, in visual-
10 word identification. In the third article, Grossi, Savill, Thomas and Thierry present an
11 ERP study exploring the interactions between bilinguals' linguistic experience and
12 orthographic and lexico-semantic effects associated with cross-language orthographic
13 neighborhood effects in two groups of English-Welsh bilinguals. Hand, O'Donnell and
14 Sereno present an article exploring the early interactions between the orthographic
15 constraint imposed by word-initial letters and context-based predictability effects using
16 eye movement tracking techniques. A similar rationale is followed in the article by Lee,
17 Liu and Tsai, offering electrophysiological data regarding interactions between
18 contextual information and early orthographic processing. Kinoshita and Norris provide
19 the last Original Research article summarizing recent findings from the visual-word
20 recognition domain and proposing an interpretation of masked priming based on the
21 Bayesian Reader account that explains some controversial task-dependent effects. The
22 Research Topic then continues with three Review articles and one General
23 Commentary. Van Assche, Duyck and Hartsuiker offer an outline of recent data
24 demonstrating that lexical access is language-non-selective in bilinguals, both at the

1 level of recognizing words in isolation and at the level of recognizing words in sentence
2 context. Hyönä presents an overview of the findings on compound word identification,
3 and provides a physiologically valid for the way in which polymorphemic words are
4 processed in alphabetic languages, based on visual acuity principles. Amenta and
5 Crepaldi offer the last Review article, which is also related to the processing of
6 polymorphemic words. They summarize benchmark morphological processing effects
7 and set the scenario for future experimental and theoretical work by highlighting the
8 most consistent and inconsistent findings. The General Commentary by Koester extends
9 some of the issues raised by Amenta and Crepaldi, and raises other concerns regarding
10 the future of neurocognitive scientific activity on morphological processing (see also the
11 General Commentary by Crepaldi and Amenta; doi: 10.3389/fpsyg.2013.00056).

12 As the (proud) Editors of this Research Topic, we honestly believe that the
13 initial aims have been fulfilled. The excellence of the Original Research articles is
14 doubtless, and they nicely cover different experimental approaches (i.e., behavioral or
15 eye-tracking techniques, ERPs, TMS) to current questions regarding monolingual and
16 bilingual lexical access. Similarly, the worth of the Review articles is undeniable. These
17 Review articles represent a compelling updated overview of critical topics for the
18 community investigating lexical access, and they will certainly serve for inspiration for
19 other researchers in the field. Now it is time for the audience to assess the value of all
20 these articles, and we sincerely hope that the reception will be at least as good as it has
21 been during these last months, in which the amount of views and downloads of the
22 articles has been heartening.