Exploring the automaticity of reading processes: Task demands moclulation of behavioral and electrophysiological responses

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Previous studies seem to indicate an automatic processing fired when expert readers are confronted with written material. The N170 component has been identified as a brain wave reflecting early print-tuning processes. It is known that in alphabetic scripts, the N170 component presents a left lateralized distribution in the visual word-form area located in the occipito-temporal cortex. In the present study, we explored the degree to which reading processes are automatic. To this end, three non-linguistic tasks with increasing attentional demands were implemented in a within participants' design including a fast presentation paradigm. In this way, participants were required to identify
a) color changes in the linguistic strings, b) color changes in a fixation point, and c) conjoined color and form changes in a fixation point. Behavioral results revealed that detection rates were higher when attention was directly deployed on the linguistic material while the worst performance was associated with the conjoint task. Therefore, behavioral results supported the increase in cognitive demands across tasks. The N170 component revealed reading related responses when participants identified color changes in the own strings but this modulation disappeared when the attentional demands increased in the task. It can be concluded that the reading processes are not as automatic as previously assumed, and direct attention to the material is necessary to observed the print tunning N170 modulations associated with the processing of written material.