
Using a mindless reading task to reveal the tiny modulations of language-related processes on readers' eye movement behavior

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Résumé

Eye movements during reading are classically assumed to reflect ongoing linguistic processes. However, this view remains debated. One of the major arguments which has been raised against this assumption comes from mindless-reading studies revealing great similarity in eye movement behavior in the presence or absence of linguistic content. In this framework, only the remaining differences are attributed to top-down language-related modulations of eye movement behavior.

Here, we tested this assumption further by investigating whether differences between mindless and mindful reading can be assimilated to the effects of linguistic processing.

Twenty participants read 316 French sentences, as well as 316 z-transform sentences (all letters replaced by the letter "z"), while their eye movements were registered.

Using linear mixed-effect models, we estimated the effects of linguistic content on several benchmark eye movement phenomena (i.e., the relationship between word skipping and word length, the preferred viewing location effect, the (inverted-) optimal viewing position effect) and compared these effects to the effects of linguistic variables (word frequency and predictability).

We first found that all benchmark eye movement patterns were preserved in the z-reading condition. Importantly, there were some remaining differences between z-reading and normal reading that roughly matched the differences observed between high- and low- frequency/predictability words, suggesting that at least part of these differences can be attributed to language-related modulations.

Results will be discussed in the framework of a recent model of eye movement control that explains reading behavior simply based on low-level visuomotor principles in the superior colliculus.

Mots-Clés: Reading, Mindless reading, Linguistic processes, Eye movements

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