Peripheral information effect in perceptual word identification in French third and fifth graders

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INTRODUCTION

While reading, information processed by expert reader is mainly acquired from the foveal area. However, information located in parafoveal area is also partially extracted. Before being fixated, parafoveal information will be preprocessed and thus more rapidly identified on the next fixation.

Area from which information can be extracted during a single fixation extends about 3-4 characters to the left of fixation to 14-15 characters to the right of fixation. This area is asymmetric to the right and corresponds to the global perceptual span. More restricted, area from which a word can be identified extends no more than 7-8 letters to the right of fixation and corresponds to the word identification span (Rayner, 1998).

Just like expert reader, the beginning reader is also able to gain parafoveal information, but to a lesser amount than the skilled reader. Rayner (1986) showed that the beginning reader could not extract parafoveal information beyond 11 characters to the right of fixation. A recent study of Häikiö, Bertram, Hyönä & Niemi (2009) reports that in comparison with the expert reader, the beginning reader shows a less extended word identification span. As reading skills increase, perceptual span and word identification span will grow gradually and become comparable to those observed in the expert reader.

Given that the total amount of information processed at a time is limited, parafoveal processing can be seen as an additional processing. Thus, it can disturb foveal word identification in the beginning readers.

THE PRESENT STUDY

This exploratory research conducted on the child reader uses an innovating paradigm and is interested into the perceptual span in reading single words. It aims to see if parafoveal processing can be seen as an additional processing. Thus, it can disturb foveal word identification in the beginning readers.

RESULTS

1) Distractor effect

Experiment 1: TA rate identification were higher for TA than TD, for the third graders (74.2% vs 67.7%, p < .002) and for the fifth graders (81.9% vs 76.5%, p < .002)

Experiment 2: TA rate identification were higher for TA than TD, for the third graders (70.6% vs 63.3%, p < .002) and for the fifth graders (74.2% vs 67.7%, p < .002)

2) Distractor position effect

As soon as the third grade, foveal words identification of high and low frequency goes hand in hand with acquisition of peripheral information. This acquisition differs according to the frequency of the target word. For the two groups of readers, high frequency word identification is deteriorated by parafoveal distractors as much as parafoveal distractors. One the other hand, low frequency word identification is less deteriorated by parafoveal distractors than parafoveal distractors.

This pattern of results is observed when distractors appear in the left visual field as well as in the right visual field.

CONCLUSIONS

Distractors have a detrimental effect in high and low frequency words identification, for third graders as for fifth graders. However, distractor position does not have the same effect according to the frequency of the target word. For the two groups of readers, high frequency words identification is deteriorated by parafoveal distractors as much as parafoveal distractors. One the other hand, low frequency words identification is less deteriorated by parafoveal distractors than parafoveal distractors.

This pattern of results is observed when distractors appear in the left visual field as well as in the right visual field.

As soon as the third grade, foveal words identification of high and low frequency goes hand in hand with acquisition of peripheral information. This acquisition differs according to the frequency of the target word to be identified for the two groups of readers. When high frequency words are identified, parafoveal information is extracted as much as parafoveal information. When low frequency words are identified, less parafoveal information is extracted as compared to parafoveal information.

These results suggest that the size of the perceptive span is modulated by the frequency of the target words processed in foveal area. Identifying low frequency words leads to a reduction of the size of the perceptual span.

Area from which information is extracted does not appear more extended to the right of fixation for the fifth graders than for the third grade. This result suggests that the asymmetry of the perceptual span could be developed more late.

REFERENCES


