Fixation Related Potentials in visual search for words

Barber, H. A.[1, 2], Dampuré J.[3]
[1]Basque Center on Cognition, Brain and Language (BCBL); [2]Universidad de la Laguna (ULL); [3]Université catholique de l'Ouest
hbarber@ull.edu.es

Searching for words is an everyday task that we perform, for example, when surfing the Internet. In these situations, parafoveal perception plays a central role in attentional guidance, which determines the efficiency of these sorts of tasks. Semantic parafoveal perception has been extensively studied in word processing in normal reading or in visual search with non- verbal stimuli. However, the meaning-based attentional guidance in visual search for words has received less attention. In a series of experiments, we have modified visual search tasks to adapt them to the eye-tracking, ERPs and FRP techniques. In these tasks, participants had to report the absence or the presence of target-words in displays of three-words: one in the centre and two in the parafovea (which could be either semantically-related or unrelated to the target word). Participants searched for target-words either given in advance (i.e. literal task), or defined by their semantic category (i.e. categorical task). Additionally, since the
amount of cognitive resources can be a strong determinant of the efficiency of parafoveal processing, we manipulated the foveal load by varying the lexical frequency of the word in the centre. Across experiments, consistent results were found between eye movement measures and different electrophysiological effects. Early (N1 and P2) attention-related effects were followed by semantic effects (N3 and N400) associated with meaning processing of the words perceived parafoveally. Considering the present results, some ideas will be proposed in relation to the advantages of the co-registration approach in more complex and natural situations.