

The researchers test the hypothesis that predictability influences eye movements through an influence on early orthographic processing, which is carried out in parafoveal vision while a word is not viewed with maximum visual acuity. This implies a Bayesian account of the predictability effect, whereby the influence of a contextually based prior is strong only when perceptual evidence is relatively ambiguous. The effect of predictability in ERPs is thought to be an entirely distinct effect on late, integrative processes.

To test the predictions of these hypotheses, eight eye-movement experiments using the boundary paradigm (in which a word is replaced by a different word until it is directly fixated) will be carried out. Three of these experiments also require participants to detect the change from preview to target explicitly, as the hypotheses make novel predictions about the circumstances in which such changes are detectable. Two of the experiments combine eye-movement recording and the boundary paradigm with concurrent ERP measures. In these experiments the effects of predictability on eye movements and ERPs are expected to be fully dissociable, with one or the other emerging depending on the nature of the preview word and the target word.

Finally, the E-Z Reader model of eye movements in reading will be modified to account for these effects, as well as other predictability-related phenomena. A new, publicly available implementation of E-Z Reader will be developed, which will allow other researchers to evaluate the model's architecture and test the effects of changes to model parameters.