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Predicting Fixation Locations in 43 Languages based on Perceptual Constraints and Information Theory

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Abstract

Why do readers typically fixate near the center of a word, with a bias towards word onset? Alhama, Siegelman, Frost, & Armstrong (2019) proposed an account based on (1) perceptual constraints that reduce the likelihood of perceiving a letter the further it is from the fixated location, and (2) the information available from the perceived letters for identifying the word. We expand this work to predict the fixation location distributions of 7-letter words for 43 languages from 9 language families. We found that in the majority of the languages, words were most likely to be correctly recognized when fixating near the center, slightly toward onset. However, there were deviations from this trend, such as predicting more accurate recognition when fixating slightly towards offset in Slavic languages. Our results provide novel predictions for experimental work that considers a flexible language system that optimizes initial fixations based on information theory constraints.

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