

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Deep networks as cognitive models: the case of reading in different orthographies

Permalink

<https://escholarship.org/uc/item/2nk606v2>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 44(44)

Authors

Zugarramurdi, Camila
Assis, Soledad
Valle-Lisboa, Juan C

Publication Date

2022

Peer reviewed

Deep networks as cognitive models: the case of reading in different orthographies

Camila Zugarramurdi

Universidad de la Republica, Montevideo, Uruguay

Soledad Assis

Universidad de la República, Montevideo, Montevideo, Uruguay

Juan Valle-Lisboa

Unviersidad de la República, Montevideo, Montevideo, Uruguay

Abstract

Although Artificial Neural Networks were born as Neurocognitive models, the architectures used nowadays in AI are not conceived as models of the brain. In the last few years, Deep networks have been fitted to brain activity to use them as neural models, but their use as cognitive models is less prevalent. Here we use a transformer model complemented with a simplified visual input to model reading acquisition. First, we trained the network to recognize the speech input. After that, we use letter sounds and letter visual representations to train the network to output the correct letters. We apply this model to our empirical previous results, comparing learning in a transparent (Spanish) and an opaque (French) orthography as in transparent orthographies, phonological awareness is much less important than in opaque orthographies as a predictor of reading. We show that the difficulty of training correlates with opaqueness, and interpret the results.