Title

Unconsciously deciphering your doctor's handwriting: Subliminal invariance for handwritten words in the visual word form area

Permalink

https://escholarship.org/uc/item/48m1833t

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 31(31)

ISSN

1069-7977

Authors

Cohen, Laurent
Dehaene, Stanislas
Naccache, Lionel
et al.

Publication Date

2009

Peer reviewed

Unconsciously deciphering your doctor's handwriting: Subliminal invariance for handwritten words in the visual word form area

Emilie Qiao

Iserm, Cognitive Neuro-imaging unitUNIVERSITE PARIS VI, FACULTE DE MEDECINE PITIE-SALPETRIERE CEA, NEUROSPIN CENTER COLLEGE DE FRANCE

Fabien Vinckier

Marcin Szwed

Lionel Naccache

Romain Valabregue

Stanislas Dehaene

Laurent Cohen

Abstract: Expert readers exhibit a remarkable ability to recognize handwriting, in spite of enormous variability in character shape - a competence whose cerebral underpinnings are unknown. Subliminal priming, combined with neuroimaging, can reveal which brain areas automatically compute an invariant representation of visual stimuli. Here, we used behavioral and fMRI priming to study the areas involved in invariant handwritten word recognition. Compared to printed words, easily readable handwritten words caused additional activity in ventral occipito-temporal cortex, particularly in the right hemisphere, while difficult handwriting also mobilized an attentional parieto-frontal network. Remarkably, however, subliminal repetition effects were observed across printed and handwritten styles, whether easy or difficult to read, both behaviorally and in the activation of the left visual word form area (VWFA). These results indicate that the left infero-temporal VWFA possesses an unsuspected degree of fast and automatic visual invariance for handwritten words – although surprisingly this invariance can be reflected both as repetition suppression and as repetition enhancement.