# Scan, scroll, swipe: the brain in a visually saturated world

Study explores the processing capabilities of the brain in the new media age's speedy messaging.

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From email to social media, we're inundated with on-screen text, forever changing the way we consume content. Can our brains process all this text as quickly as it does visuals?

A team of linguistics and psychology researchers led by New York University (NYU) used brain imaging to answer this question. They set out to determine if the brain's language comprehension system handles sentences flashed on a screen in a similar way to how it perceives a visual scene. The study was published in the journal 'Science Advances'.

## This is your brain... on language processing

The results showed that the brain can detect a short sentence's basic structure in about 150 milliseconds, or about the time it takes to blink. The researchers measured the brain activity of 36 people while they read word lists comprised of grammatical sentences or lists of nouns. The participants saw a three-word starting sentence that flashed for 300 milliseconds, followed by a second sentence that was either exactly the same or differed by one word. They were asked to simply indicate whether the second matched the first.

Findings revealed that the brain started differentiating simple three-word (subject-verb-object) sentences (e.g. nurses clean wounds) from unstructured word lists (e.g. hearts lungs livers) in as little as 130 milliseconds. Even with grammatically incorrect sentences, the brain quickly identified the structure and automatically corrected minor mistakes.

## Digital media delivery deluge

The brain's staggering speed in processing language remains surprisingly unaffected despite the massive shift from leisurely reading to skimming and scanning.

"This shift has made it clear that our brains not only have the ability to instinctively process rapid messages, but can also make snap decisions based on them—like whether to keep or delete an email or how to respond to a brief social media update," explained co-author Liina Pylkkänen, professor at NYU's Department of Linguistics and Department of Psychology, in a news release. "But how well do we really understand these quick messages and how do our brains manage them? The fact that our brains can, at least in some way, grasp the meaning of these fast messages from just a single glance may reveal something fundamental about the processing potential of the language system."

"We don't yet know exactly how this ultrafast structure detection is possible, but the general hypothesis is that when something you perceive fits really well with what you know about – in this case, we're talking about knowledge of the grammar – this top-down knowledge can help you identify the stimulus really fast," Prof. Pylkkänen told 'The Guardian'. "So just like your own car is quickly identifiable in a parking lot, certain language structures are quickly identifiable and can then give rise to a rapid effect of syntax in the brain."

## Keywords

brain | email | social media | text | content | language | screen | sentence | word | messages

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