ANIMATION SCRIPT

WHAT DO EYE MOVEMENTS TELL US ABOUT THE PSYCHOLOGY OF HOW WE READ AND PROCESS WORDS?
PROFESSOR SIMON LIVERSEDGE & DR CHUANLI ZANG

TO MAKE THE MOST OUT OF THIS SCRIPT, YOU COULD:

• Stick it in your book as a record of watching Simon and Chuanli's animation

• Pause the animation and make notes as you go

• Add your own illustrations to the sheet

• Create your own animation to accompany it

• Add notes from classroom discussions

• Make notes of areas you will investigate further

• Make notes of key words and definitions

• Add questions you would like answered – you can message Simon and Chuanli through the comments box at the bottom of their article:

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SCRIPT:

Over the past few decades, a lot of research into the cognitive processes behind reading has focused on alphabetic writing systems like English.

Professor Simon P. Liversedge and Dr Chuanli Zang, from the University of Central Lancashire in the UK, and their colleagues Professors Xuejun Bai and Guoli Yan, from Tianjin Normal University in China, are investigating how people read Chinese. Chinese is different to alphabetic writing systems because it is character based, unspaced and has unclear word boundaries.

Using eye tracking experiments, scientists have established that we do not sweep our eyes smoothly across a sentence when we read. Instead, we alternate between rapid eye movements called saccades, followed by fixations, which are periods when our eyes stay relatively still.

Foveal vision is vision within the central part of the eye. In foveal vision, very detailed information is encoded, which allows words to be fully processed and identified.

Parafoveal vision is in the region of the eye which surrounds the fovea. In parafoveal vision, the eye's ability to distinguish shapes and details is reduced and words are partially processed.

Saccades bring the words in the parafovea into foveal vision. Readers do not fixate on all words – they sometimes skip them, making a saccade over them.

Understanding how people read non-alphabetic, unspaced writing systems like Chinese, allows the team to investigate whether multiple words are identified at the same time, or one by one.

The team uses an eye tracker, a device that measures people's eye movements while they read. The eye tracker is positioned in front of a research participant who sits and reads sentences from a computer screen. The tracker records the reader's eye position every millisecond to give a very precise indication of which particular letter or character the reader is fixating on.

Data are recorded on eye position, the duration of fixations, the time readers spend processing a word, how often readers skip a word and whether readers make right-to-left movements to re-read portions of sentences. These measures indicate which parts of the text are more difficult to read. The team then does statistical analyses of the data.

Based on these experiments, the team has developed the Multi-Constituent Unit (MCU) hypothesis. It may explain why experiments suggest that when people read, on some occasions, multiple words are identified at the same time, and, on other occasions, words are identified one by one.

Some frequently occurring linguistic units are made up of more than a single word. These MCUs may be processed as if they were single words, which could result in more than one word being processed at the same time.

The team's experiments have shown that frequently used Chinese phrases, idioms, famous people's names, place names, product names and popular phrases are often processed as MCUs during reading.

The team's work has the potential to influence educational practice related to teaching, literacy development and support for those with learning difficulties.

What would you investigate in the field of cognitive psychology?