# Why training people to recognise specific objects improves ability

October 3 2014

Examining WWII aerial reconnaissance photos. Credit: Medmenham Collection

(Medical Xpress)—During the Second World War, analysts pored over stereoscopic aerial reconnaissance photographs, becoming experts at identifying potential targets from camouflaged or visually noisy backgrounds, and then at distinguishing between V-weapons and innocuous electricity pylons.

Now, researchers at the University of Cambridge have identified the two regions of the brain involved in these two tasks – picking out objects from background noise and identifying the specific objects – and have shown why training people to recognise specific objects improves their

ability to pick out objects.

In a study funded by the Wellcome Trust, volunteers were given a series of 3D stereoscopic images with varying levels of background noise and asked first to find a target object and then to say whether the object was in the foreground or the background. During the task, researchers applied transcranial magnetic stimulation (TMS) – a technique whereby a magnetic field is applied to the head – to disrupt the performance of two regions of the brain used in object identification: the parietal cortex and the ventral cortex. Their results are published in the journal *Current Biology*.

The researchers showed that the parietal cortex was involved in selecting potential targets from background noise, while the ventral cortex was involved in object recognition. When TMS was applied to the parietal cortex, volunteers performed less well at selecting objects from the background; when the field was applied to the ventral cortex, they performed less well at identifying the specific objects.

However, the researchers found that after the volunteers had undergone training to discriminate between specific objects, the ventral cortex – which, until then, had only been used for this purpose – also became involved in selecting targets from noise, enhancing their ability to distinguish between objects. The reverse was not true – in other words, the parietal cortex did not become involved in object discrimination.

Dr Welchman, a Wellcome Trust Senior Research Fellow in the Department of Psychology, explains: "The parietal cortex and the ventral cortex appear to be involved in the overlapping tasks to a different extent. By analogy to the World War II analysts, the parietal cortex helped them spot suspect objects while the ventral cortex helped them distinguish the weapons from the pylons. But training these operatives to identify the weapons will have improved their ability to spot potential

weapons in the first place."

The research may have implications for therapies to help people with attentional difficulties. For example, people with damage to the parietal cortex, such as through stroke, are known to have difficulty in finding objects in displays, particularly when the display is distracting.

"These results show that training in clear displays modifies the brain areas that underlie performance in distracting situations. This suggests a route for rehabilitative training that helps individuals avoid distracting information by training individuals to make fine judgements," he adds.

Provided by University of Cambridge