The blindfold study

Blind people can do certain things much better than sighted people, such as localise sounds in space and read Braille. Their verbal memory also tends to be better. Brain imaging suggests that they have these talents partly because they call upon the visual cortex – no longer involved in seeing – to help out. Is this some extraordinary adaptation that happens in brains that have grappled with sightlessness for years? Neurologist Alvaro Pascual-Leone at Harvard Medical School suspected not. To test his hunch, in 1997 he began the Blindfold Study.

Over the years, his team has blindfolded dozens of subjects for five days straight to find out just how flexibly and quickly the average brain can respond to blindness. Sometimes they taught people Braille, then tested how well they could recognise the letters through touch alone on day one versus day five. Other experiments have explored whether people's ability to localise sound improves after being deprived of sight.

In both these cases, subjects performed better on day five than day one. Brain scans with fMRI revealed that just like blind people, volunteers were recruiting their visual cortex to carry out these non-visual tasks. What's more, if on day five Pascual-Leone temporarily disabled the visual cortex using TMS, the volunteers were suddenly unable to identify the Braille characters or figure out as accurately where sounds were coming from. TMS had no effect on performance on day one.

All this calls into question the idea that the visual cortex is exclusively visual, Pascual-Leone says. He believes that that part of the brain simply prefers vision, but when vision is not an option, it can draw information from the other senses. His ideas reflect a growing realisation that the human brain is much more flexible than previously thought. It is made to be versatile and adaptable, argues Pascual-Leone, and it doesn't dally when a sense goes AWOL – it just moves on to another.