Conclusion


eight letters learned? An fMRI study

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Familiar and unfamiliar alphabets are processed and learned in the same part of the fusiform gyrus. Familiar and unfamiliar alphabets are processed and learned in the same part of the fusiform gyrus.

Method

Pre-scan:

Threshold contrast was determined for each participant to equate the difficulty of the conditions.

Scan:

Conditions during the fMRI scan included English/Blank, Hindi/Blank, and English/Hindi. Blank conditions were the same as the other conditions but with no letters.

Post-scan:

Training involved repeating the task with the Hindi condition over 2,000 trials, which allowed the participants to attain the same proficiency in identifying letters of the Hindi alphabet as fluent readers of Hindi (Pelli et al. 2003).

Task:

Participants viewed a sequence of three letters in visual noise, one after the other. They were then asked to identify the "odd-man out," the letter that differed from the other two. An answer screen followed, showing four possible letters from which the observer could choose. We tested a familiar alphabet, English, and an unfamiliar alphabet, Hindi.

Results

Before: English and Hindi activated the same area of the fusiform gyrus, but English activation was stronger. The images show English minus Hindi activation. After training, Hindi activation increased to match that of fluent readers, as shown in the images.

Introduction

How modular is the brain? Polk et al. (2002) identified a brain area in the fusiform gyrus that seems to be specialized for letter processing. We have found that within 2,000 trials, observers process unfamiliar letters more to known letters than to digits or shapes. How does this area change with learning? What effect does training have on the activation of the fusiform gyrus? If the area becomes less discriminative for identifying letters of an unfamiliar alphabet, the letters may appear to the brain as another category of stimuli.