BRIEF SUMMARY

Buckner, R. L., Koutstaal, W., Schacter, D. L., & Rosen, B. R. (2000). Functional MRI evidence for a role of frontal and inferior temporal cortex in amodal components of priming. *Brain, 123,* 620–640.

Changes in human brain activity associated with repetition priming during word generation were characterized across a series of neuroimaging and behavioural studies. Repetition priming was consistently observed behaviourally as a decrease in response latency for repeated items, and was found for both visually and aurally cued word-generation tasks. Brain imaging using whole-brain functional MRI identified neural correlates of these effects. The principle effect of priming was to reduce neural activity within regions that were already being used to perform the word-generation tasks. Repeated word generation in response to visual cues was correlated with anatomically selective reductions in activity within the left frontal cortex along the inferior frontal gyrus and inferior temporal regions and, to a lesser degree, in specific earlier visual regions. These reductions were reversed when new items were presented, indicating that they were item-specific. Repeated word generation in response to aural cues also showed anatomically selective activity reductions within the left frontal and inferior temporal regions, indicating that these activity reductions were not dependent on the perceptual modality of the cue. The auditory cortex showed minimal repetition-related reductions. The presence of activity within left frontal regions that decreases as a function of item repetition for both visual and auditory cues suggests that these reductions may underlie an amodal repetition-priming effect existing at processing stages involving lexical/semantic search and access. The surprising finding that activity reductions in the inferior temporal cortex can be linked to repetition of either visual or auditory cues further suggests that these regions may be modulated in a top-down fashion during repetition priming, independent of (or in parallel with) stimulus-driven perceptual processes. Taken collectively, the data converge on a neural correlate of lexical/semantic priming. Amodal lexical/semantic processes, which may be triggered initially by modality-specific cues, proceed via an interaction between frontal and posterior brain regions. These interdependent regions show activity reductions that correlate with facilitated task performance when items are repeated.

KEYWORDS: priming, memory, learning, neuroimaging, frontal cortex, inferior temporal cortex, prefrontal cortex, implicit memory

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