

# An event-related fMRI study of inhibitory control

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## Abstract

The ability to inhibit inappropriate responses is central to cognitive control. In this study, we applied spatial Bayesian hierarchical models to examine which brain areas exhibit the ability of inhibitory control as well as to examine the effect of preceding context on inhibitory processes. A comparative study using Bayesian and classical approaches in localizing brain regions that are active during the inhibitory response task was introduced. Both approaches indicated that the inferior frontal lobe (IFG), middle frontal gyrus (MFG), anterior cingulate gyrus (ACG), and superior parietal lobule (SPL) are critical for successful implementation of inhibitory control over motor responses. Our results also demonstrate that the MR signal changes increase with the degree of difficulty in tasks in the IFG. This finding suggests that the role of the IFG may be maintaining the response demands as interference from the tasks increases.