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Does dorsal anterior cingulate cortex respond to only response conflict?

Goal-directed behavior requires cognitive control to regulate the occurrence of conflict. The dorsal anterior cingulate cortex (dACC) has been suggested in detecting response conflict during the conflict tasks. Recent findings, however, have indicated not only that two distinct subregions of dACC are involved in conflict processing but also that the conflict occurs at both perceptual and response levels. We clarified a functional dissociation of the caudal dACC (cdACC) and the rostral dACC (rdACC) in responding to different sources of conflict by using a version of the Stroop matching task. The cdACC was selectively engaged in perceptual conflict whereas the rdACC was more sensitive to response conflict. Further, the dorsolateral prefrontal cortex (DLPFC) was coactivated with rdACC but not with cdACC. We suggest that rdACC is involved in detecting response conflict whereas cdACC plays an important role in detecting and possibly, regulating perceptual conflict.

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