Investigations into the frequency of ‘no-go’ cues in a simple go/no-go paradigm

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Introduction

• Response inhibition is the ability to suppress pre-potent responses which has been associated with impulsivity

• Prefrontal cortex (PFC) regions are activated in response inhibition tasks

• Questions remain as to whether using a high percentage of no-go cues taps into response inhibition or response selection (i.e. examines responding between two equally frequent cues, rather than examines inhibiting pre-potent responses

Aims and Hypotheses

• Using fMRI we investigated the effects of frequency of the no-go cues

• We hypothesised there would be no difference in PFC activation

Method

• 18 participants (8 female, 10 male) completed a go/no-go paradigm in a 1.5T scanner

• 108 volumes were acquired with T2*-weighted, gradient echo, EPI

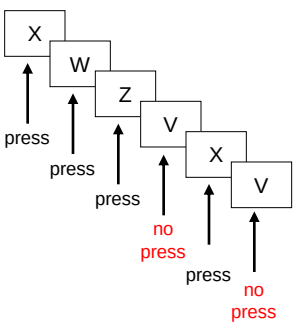
• Each volume was 40 slices with a slice thickness of 3.5mm

Task

•Participants were presented with a series of letters to which they were instructed to respond ('go') or not respond ('no-go')

• All letters were 'go' cues apart from the letter V

• Stimuli appeared every 1.7 seconds in 45 second blocks



•The task was an ABAC blocked design, repeated 3 times

• A – 100% go

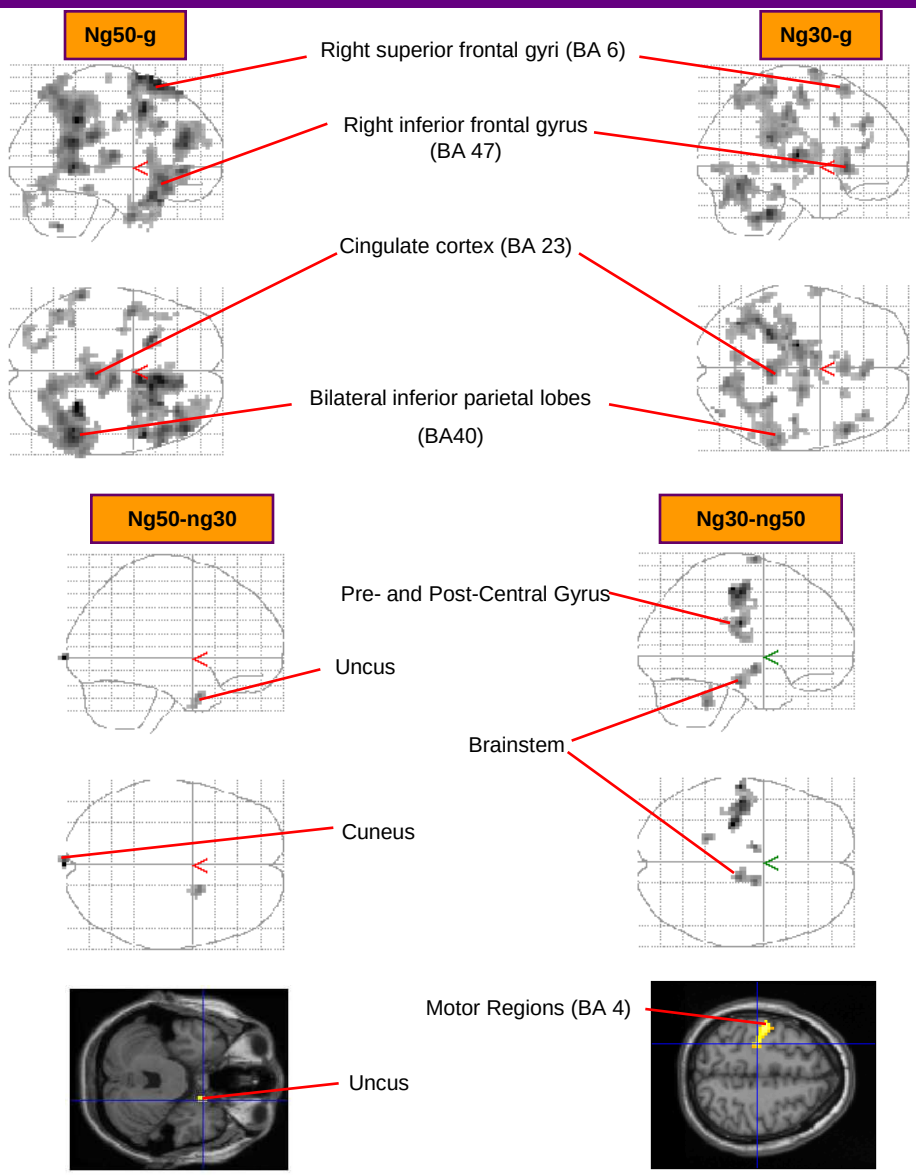
• B – 50% no-go

• C – 30% no-go

Analysis

• Data were analysed using SPM2 with a random effects model

Results



Conclusions

• Significant BOLD responses during both ng50-g and ng30-g conditions were observed in predominantly right prefrontal cortex regions, confirming previous findings

• No additional BOLD responses were observed in prefrontal cortex regions in either the ng50-ng30 or ng30-ng50 contrasts, suggesting that paradigms with 50% no-go cues are response inhibition tasks rather than response selection

• Significant BOLD responses in the ng30 contrast compared to the ng50 condition (ng30-ng50) were observed in motor regions, presumably related to increased motor demands of responding 70% (ng30) rather than 50% (ng50) of the time

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