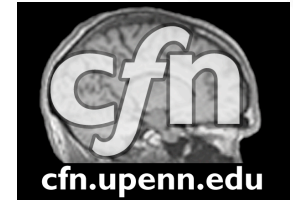


Effects of Conflict and Grammatical Class on LIFG Activation During Action and Object Naming

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Background

-Left Inferior Frontal Gyrus (LIFG) is active during language and semantic memory tasks -- e.g. lexical decision, conjugation, semantic triad and picture naming.

-Lesion and imaging studies report LIFG specialization for verbs and Left Temporal specialization for nouns. Thus, many have concluded that these areas encode or mediate separate domains of semantic knowledge.^{1,2}

-Other studies refute this claim with evidence for domain general functions.^{3,4,5}

-Previous studies have confounded conflict with word class. Object stimuli could only be named with nouns, whereas action stimuli could be named with nouns or verbs.

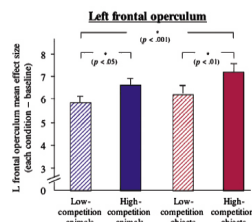
Current Study

- 1) Is LIFG activity modulated by conflict during noun and verb picture naming?
- 2) Does the LIFG "Verb Effect" go away when conflict is controlled across items?

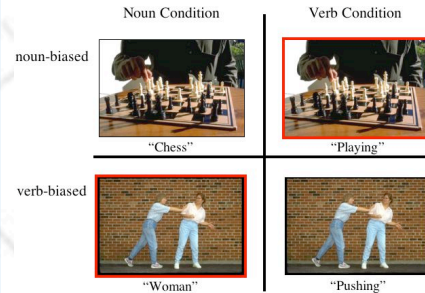
Previous Research

-Bedny, et al. (2006) report greater LIFG response to *nouns* compared to verbs in a semantic similarity judgment task.

-Kan, et al. (2006) showed that LIFG activity is modulated by conflict in object picture naming.

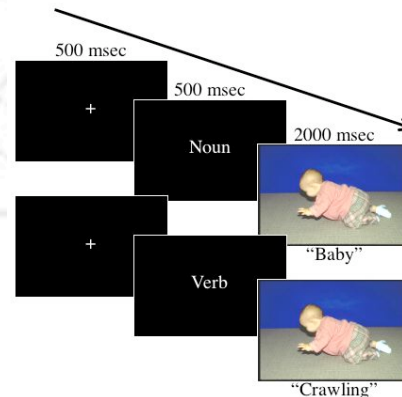


Manipulation



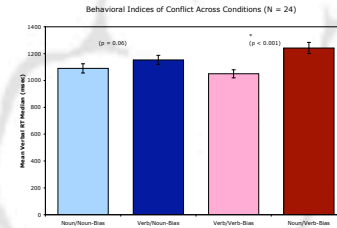
-Use name agreement to define noun- or verb-bias and manipulate conflict by altering the naming task.

Task



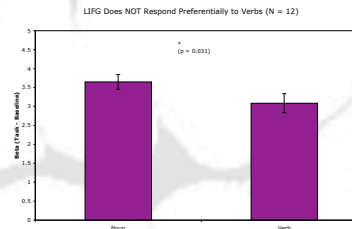
-Mixed blocks of noun and verb naming, counterbalanced with fixed-blocks of counterbalancing and baseline perceptual discrimination (not displayed).

Behavioral Results

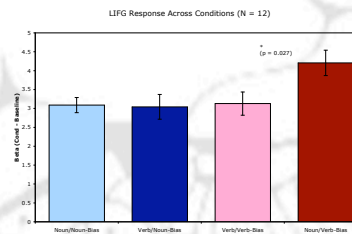


-Interaction between bias and conflict ($p = 0.011$). Main effect of conflict ($p < 0.001$).

fMRI Results



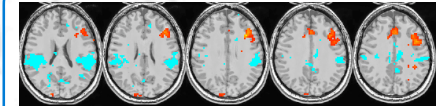
-Mean activity in LIFG ROI higher for nouns than verbs.



-Interaction between bias and conflict ($p = 0.031$).

-Significant increase in LIFG response for high conflict condition in verb-biased pictures ($p = 0.027$).

Group Analysis



-Group analysis of high vs. low conflict conditions for verb-biased items (High - Low, N = 12).

Conclusions & Directions

-Naming pictures with verbs is NOT associated with higher activation in LIFG than naming them with nouns.

-LIFG responds to conflict in items that norm as verb-biased.

-What aspect of verb-biased pictures is driving activation?

-How do other manipulations of conflict affect LIFG response?

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