

Vannest, J., Newport, E.L., and Bavelier, D.

### The Neural Basis of Frequency Effects for Inflected and Uninflected Verbs: an Event-Related fMRI Study

It is well-established that a word's frequency of occurrence affects how quickly it is accessed. This frequency effect has been exploited to investigate the role of morphological structure in processing complex words, making use of the distinction between frequency of the word's own surface form (e.g., "walk") and its base frequency (total frequency of all words containing the base morpheme "walk".) Inflected words (like "walked") consistently show effects of base frequency in behavioral studies, whereby frequency of the base predicts reaction time better than frequency of the surface form. Unexpectedly, recent studies have discovered effects of base frequency in uninflected words, suggesting that even for words without complex structure, processing is influenced by the word's entire morphological family.

fMRI studies of frequency reveal increased activation in language-processing regions for low frequency words. We used event-related fMRI to examine contrasts in base and surface frequency in complex and uninflected verbs. Fifteen participants made lexical decisions to visually presented verbs; BOLD response was measured in several regions of interest. Variation due simply to response time was removed from the data using regression analysis. Results revealed that left inferior frontal regions responded to base and surface frequency for both verb types. Subcortical areas were sensitive to surface frequency only when surface frequency was high. Only visual processing areas showed increases in activation specific to complex words. These similar patterns of frequency effects for uninflected and inflected words support the hypothesis that morphological family relationships influence access of all words, even uninflected ones.