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Research report

Rapid syntactic pre-activation in Broca's area: Concurrent electrophysiological and haemodynamic recordings

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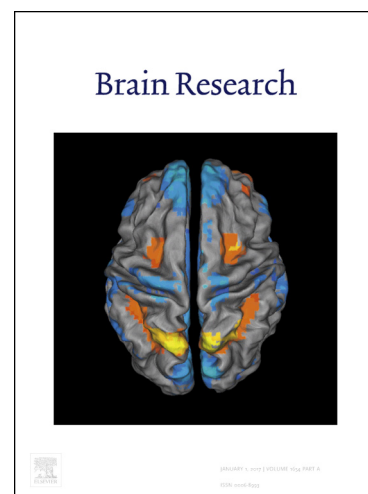
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Title: Rapid syntactic pre-activation in Broca's area: Concurrent electrophysiological and haemodynamic recordings

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Highlights

Predictive tonal cues to syntactic structure is investigated using combined ERP/fMRI

Tonal cues can be used to predict upcoming syntactic structure

More predictively useful tones give rise to syntactic pre-activation negativity

Pre-activation of syntactic structure is subserved by left frontal brain areas

Abstract

Listeners are constantly trying to predict what the speaker will say next. We concurrently measured the electrophysiological and haemodynamic correlates of syntactic pre-activation, investigating when and where the brain processes speech melody cues to upcoming word order structure. Pre-activation of syntactic structure was reflected in a left-lateralised pre-activation negativity (PrAN), which was subserved by Broca's area in the left inferior frontal gyrus, as well as the contiguous left anterior insula.

Keywords: ERP; fMRI; prediction; speech processing; prosody; syntax

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