Prediction in communication: Brain indexes of action sequence structure

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Although language is a key tool for communication in social interaction, most studies in the neuroscience of language have focused on language structures such as words and sentences. The communicative function of an utterance can be described in terms of action sequence structure, covering the intentional actions typically following upon a given speech act. Recent neuroscience evidence showed that the same linguistic utterances elicit different brain activation patterns when carrying different communicative functions. It is therefore of interest to experimentally address (i) the time course of communicative function processing, (ii) the activated brain areas reflecting the processing of specific communicative functions and (iii) any dissociations in communicative function processing arising with brain lesions. I will summarise recent results pointing to very early processing of communicative function already manifest within 200ms after the critical utterance is presented, simultaneously with the earliest lexical and semantic processing indicators [1,2]. A range of brain regions show differential activation to the same utterances carrying different communicative functions. These areas include sites commonly attributed to the processing of information about theory-of-mind, affect/emotion, and action [3]. I will argue that the latter activations are most telling about the understanding of communicative function, because they emerge first. A neuromechanistic proposal suggests that the understanding of communicative function is the prediction of sets of action options opened up by a particular speech act and that brain indexes of communicative function processing reflect the instantaneous computation of typical action predictions [4].

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