

Pragmatics in action: Indirect requests for action engage ToM areas and the neural motor system

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Research from the past decade has shown that understanding the meaning of words and utterances engages the same systems we use to interact with the physical world. For example, understanding the word 'cup' will also elicit activation in our motor network. In the embodied literature, motor activation during language comprehension is thought to reflect motor simulation underlying conceptual knowledge. Previous research has supported the view that the coupling between language and action is flexible, and reading an action word is not *sufficient* for cortical motor activation. The current study goes one step further by addressing the *necessity* of action words for motor activation during language comprehension. Subjects listened to indirect requests for action during an fMRI session. Indirect requests for action (IR) are speech acts in which access to an action-concept is required, although it is not explicitly encoded in the language. For example, the utterance "It is hot here!" in a room with a window is likely to be interpreted as a request to open the window. However, the same utterance in a desert will be interpreted as a statement. The results indicate (1) that comprehension of IR sentences activates cortical motor areas reliably more than comprehension of sentences devoid of any implicit motor information. This is true despite the fact that IR sentences contain no lexical reference to action. (2) Comprehension of IR sentences also reliably activates substantial portions of the theory of mind (ToM) network, known to be involved in making inferences about mental states of others.