

# Transcranial magnetic stimulation of primary motor cortex does not change meaning construction from action sentences

**Pablo Solana**

University of Granada, Granada, Spain

**Omar Escámez**

University of Granada, Granada, Spain

**Daniel Casasanto**

Cornell University, Ithaca, New York, United States

**Ana B. Chica**

University of Granada, Granada, Spain

**Julio Santiago**

University of Granada, Granada, Spain

## Abstract

In a preregistered experiment, we tested whether interfering with primary motor cortex (M1) activation can change how people construe meaning from language. Participants were presented with sentences describing motor actions and asked to choose between a concrete and an abstract interpretation of their meaning. Prior to this task, participants' M1 was disrupted using repetitive transcranial magnetic stimulation (rTMS). The results suggested strong evidence against the idea that M1-rTMS affects meaning construction. Additional analyses and experiments suggest that the absence of effect cannot be accounted for by failure to inhibit M1, lack of task validity, or lack of power to detect a small effect. These results do not support a causal role for primary motor cortex in building meaning from action language.