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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Permalink

<https://escholarship.org/uc/item/8jc0f159>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 41(0)

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Publication Date

2019

Peer reviewed

The inverse operation modulates confidence

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Abstract

Inversion is an essential operation, for instance in math (negatives) and action (to move in an opposite direction). Even though humans can invert is unclear how is implemented. There are two alternative hypotheses. The first possibility (H1) is that only positives are represented and negatives (inverses) are implemented as either a response (e.g. left to right) or task demand flip (e.g. ζ to \imath). The second possibility (H2) is that both positives and negatives (inverses) are encoded. To disambiguate them, we ran two experiments where participants had to apply the inverse while implicitly reporting confidence. If inverting modifies encoding of otherwise identical stimulation then confidence should differ. We found that confidence was lower in inverse trials than direct/positive trials. This suggests that the inverse is not a simple response strategy or modification of task demands (H1), rather inverting modulates how cognitive information is encoded and used in the brain (H2).