

# Rapid Formation of Psychological Inertia in Simple Learning Tasks: A View from Visual Working Memory

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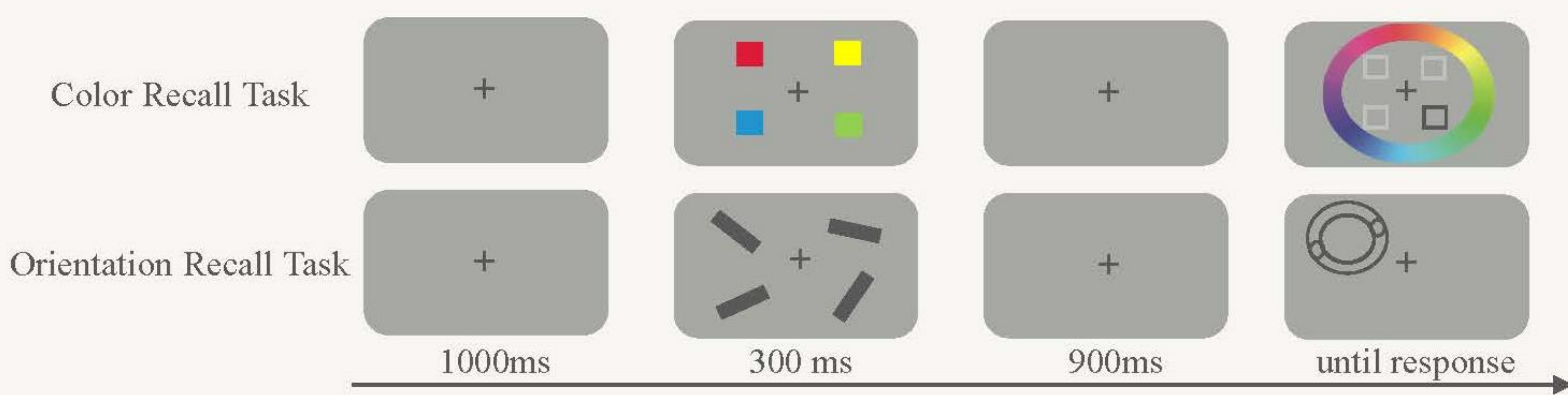
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## INTRODUCTION

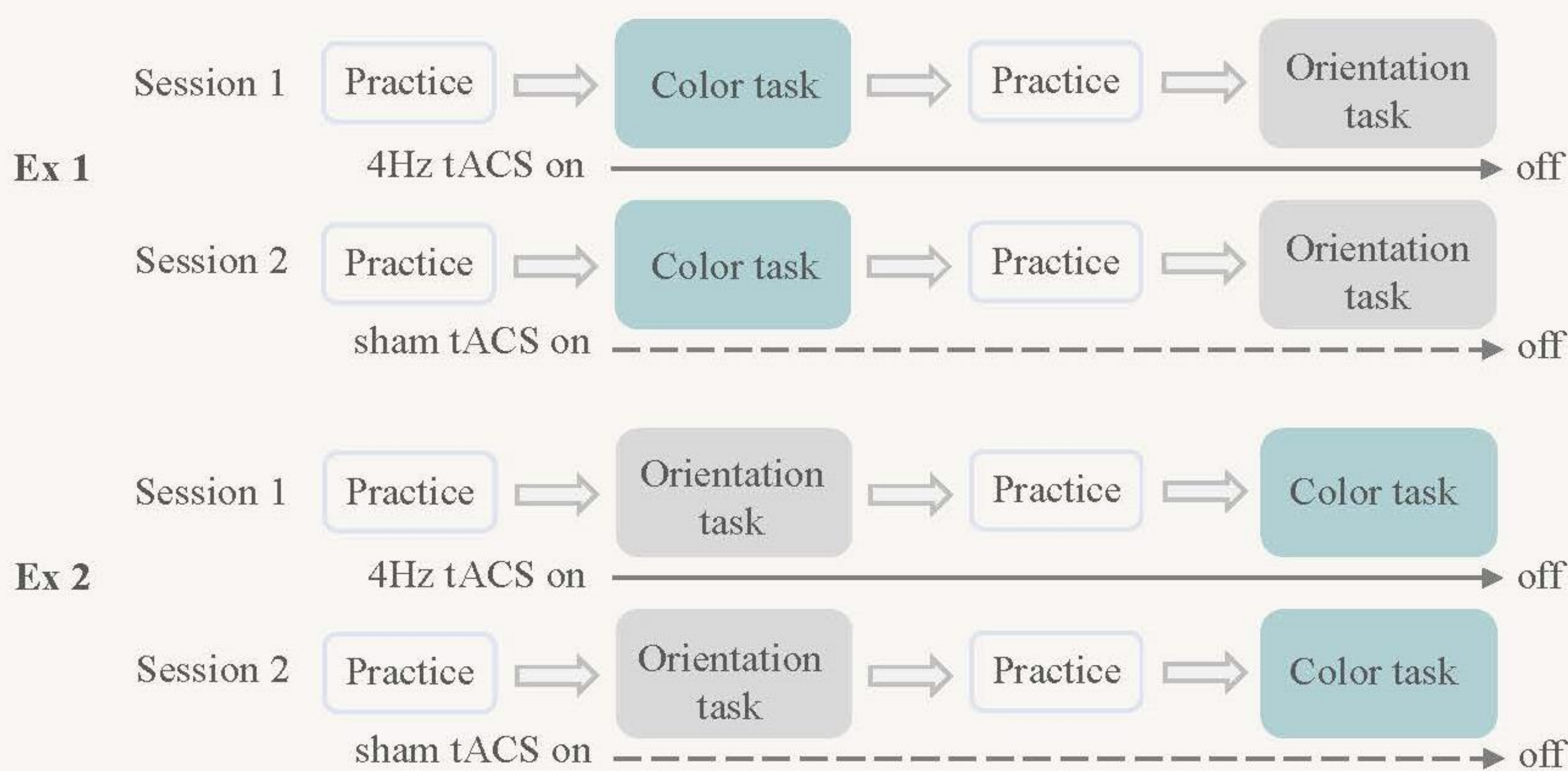
- ◆ Humans have remarkable ability to adapt to new environments and quickly learn new tasks through instructions.<sup>1</sup>
- ◆ Psychological inertia, often described as habit, reflects an irrational preference for initial choices and a resistance to change. This phenomenon has commonly been assessed using questionnaires.<sup>2</sup>
- ◆ Visual working memory (VWM) recall paradigms offer an opportunity to measure inertia objectively by comparing performance (precision and quantity) in a condition in which performance is enhanced (via transcranial alternating current stimulation, tACS) to a control condition (sham stimulation).<sup>3</sup>
- ◆ 4 Hz tACS was applied to the right posterior parietal lobe to enhance VWM capacity according to controlled timing (after or during a practice session).<sup>4</sup> We utilized various stimuli (color and orientation) to mitigate the learning effect and further assess whether the inertia generalizes to different tasks.
- ◆ We expected inertia to manifest as an enhancement of memory precision without enhancement of quantity if tACS applied after a practice, and by increasing the quantity of memory items if applied during practice, compared to sham conditions.

## METHODS

Schematic overview of experimental tasks:



Design of experiment 1 and experiment 2:



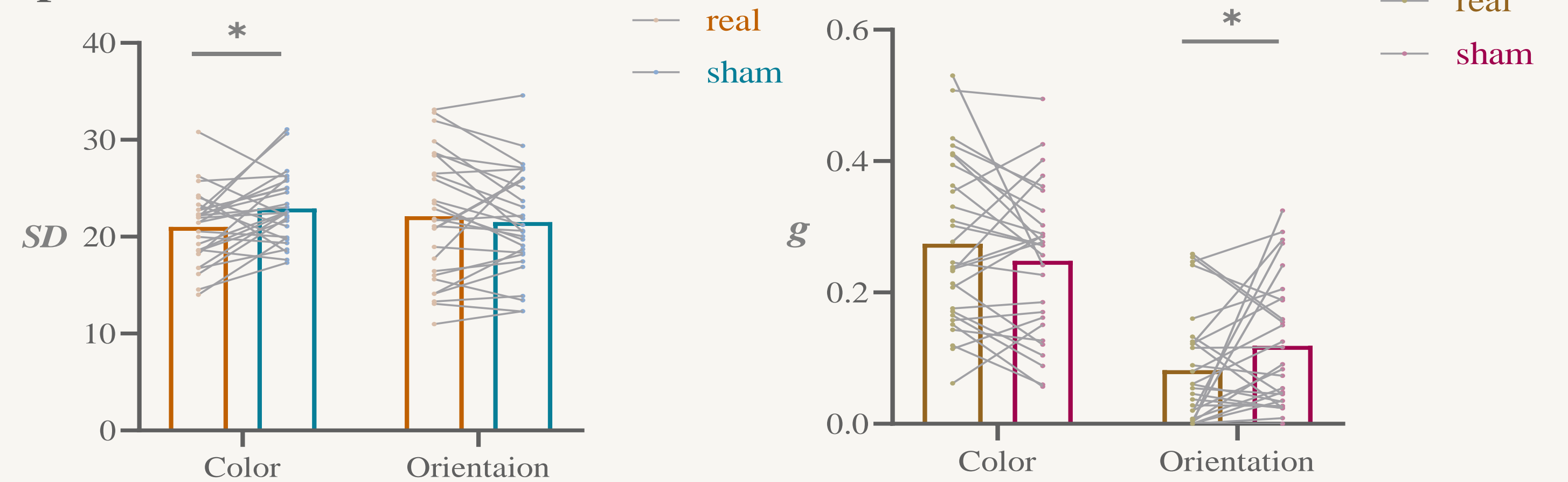
After completing a first practice phase, participants received tACS and remained active throughout the experiment.

## RESULTS

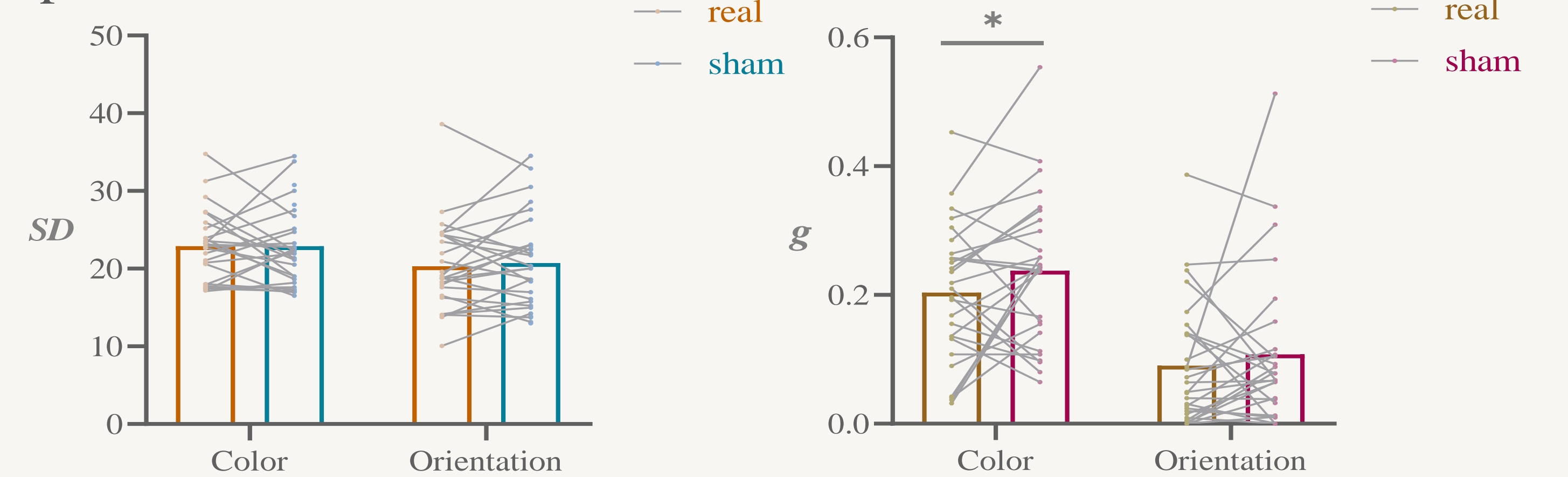
After data processing with a standard mixed model, we obtained:

- **SD**: measures the error distribution width of reported color or orientation. Lower SD values indicate higher precision.
- **g**: guess rate, an indicator of working memory quantity (1-g).<sup>5</sup>

Experiment 1:



Experiment 2:



Results of both experiments split by stimulation conditions:



## CONCLUSIONS

- Inertia did not extend to different tasks.
- Participants exhibit varied performance enhancement patterns relative to a control condition, depending on the timing of tACS application relative to the practice sessions for various tasks.
- When using electrical stimulation in studies, it is crucial to manage task difficulty to optimize the effect.

## REFERENCES

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